

Midpeninsula Regional Open Space District

Wildland Fire Resiliency Program

Draft Environmental Impact Report

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PANORAMA ENVIRONMENTAL, INC.

Midpeninsula Regional Open Space District
Wildland Fire Resiliency Program
Draft Environmental Impact Report

January 2021

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Acronyms and Abbreviations

A

AAM	annual arithmetic mean
AB	Assembly Bill
ABAG	Association for Bay Area Governments
ADA	American Disabilities Act
AF	Acre-feet
AFS	Air Force Station
APCO	Air Pollution Control Officer
AQMP	Air Quality Management Plan
ATV	all-terrain vehicle

B

BAAQMD	Bay Area Air Quality Management District
BGEPA	Bald and Golden Eagle Protection Act
BHS	Biologically Highly Significant
BMPs	best management practices
Board	Midpeninsula Regional Open Space District Board of Directors

C

C_2H_3Cl	vinyl chloride
C/CAG	San Mateo City/County Association of Governments
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards

ACRONYMS AND ABBREVIATIONS

Cal.App.	California Appellate Reports
CalEPA	California Environmental Protection Agency
CALIWAC	California Invasive Weeds Awareness Coalition
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
Cal. Rptr.	California Reporter
Caltrans	California Department of Transportation
CalVTP	CAL FIRE Vegetation Treatment Plan
CANAGPRA	California Native American Graves Protection and Repatriation Act of 2001
CAP	2017 Clean Air Plan
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CHC	Center for Hearing and Communication
CHRIS	California Historic Resources Information System
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society

CO	carbon monoxide
CO_2	carbon dioxide
CPUC	California Public Utilities Commission
CRAM	California Rapid Assessment Method
CRHR	California Register of Historic Resources
CRPR	California Rare Plant Ranking
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan

D

dB	decibel
dBA	A-weighted decibel
DBH	diameter at breast height
DPR	California Department of Pesticide Regulation
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources

E

EDRR	Early Detection and Rapid Response
EES	Emission Estimation System model
EIR	Environmental Impact Report
EMFAC2017	EMission FACtors 2017 model
ESU	evolutionary significant unit

F

FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration

FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FOFEM	First Order Fire Effects Model
FRAs	Fuel Reduction Areas
FTA	Federal Transit Administration

G

GHG	greenhouse gas
GIS	Geographic Information Systems
GO	General Order
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWP	global warming potential

H

H_2S	hydrogen sulfide
HCP	Habitat Conservation Plan
HFCs	hydrofluorocarbons

I

I-	Interstate
IPMP	Integrated Pest Management Program

L

LCFS	Low Carbon Fuel Standard
LCP	Local Coastal Program
L_{dn} (or CNEL)	energy equivalent sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level

LRA	local responsibility areas
LUST	leaking underground storage tank
LU	Regulations Land Use Regulations

M

MBARD	Monterey Bay Air Resources District
MBTA	Migratory Bird Treaty Act
MCE	maximum credible earthquake
mg/m^3	milligrams per cubic meter
Midpen	Midpeninsula Regional Open Space District
MLD	most likely descendant
MM	mitigation measure
MO Manual	Maintenance Operations Manual
MOU	Memorandum of Understanding
mph	mile per hour
MPO	Metropolitan Planning Organization
MTC	Metropolitan Transportation Commission
MTCO$_2$e	million metric tons of CO_2 equivalent
MUTCD	California Manual on Uniform Traffic Control Devices

N

N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NCCAB	North Central Coast Air Basin
NCCP	Natural Community Conservation Plan

NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NIOSH	National Institute for Occupational Safety and Health
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOP	Notice of Preparation
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center

O

O_3	ozone
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
OSP	open space preserve

P

PAH	polycyclic aromatic hydrocarbon
Pb	lead
PCEs	Primary Constituent Elements
PELs	permissible exposure limits
PFCs	perfluorocarbons
PFP	Prescribed Fire Plan
PG&E	Pacific Gas and Electric

PM	particulate matter
POST	Peninsula Open Space Trust
ppb	parts per billion
ppm	parts per million
PRC	Public Resources Code
Program	Wildland Fire Resiliency Program

R

RCRA	Resource Conservation and Recovery Act
RELs	recommended exposure limits
RM Policies	Resource Management Policies
RO Manual	Ranger Operations Manual
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board

S

SCCRCIS	Santa Clara County Regional Conservation Investment Strategy
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFBCDC	San Francisco Bay Conservation and Development Commission
SGMA	Sustainable Groundwater Management Act
SIP	State Implementation Plan
SMP	smoke management plan
SO_2	sulfur dioxide
SOD	Sudden Oak Death
SR-	State Route
SRA	State responsibility areas

STEL	short-term exposure limit
SWPPP	Storm Water Pollution and Prevention Plan
SWRCB	State Water Resources Control Board

T

TAC	toxic air contaminant
TEK	Traditional Ecological Knowledge
TMDLs	Total Maximum Daily Loads
TWA	time-weighted averages

U

µg/m^3	micrograms per cubic meter
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank

V

Valley Water	Santa Clara Valley Water District
VHP	Santa Clara Valley Habitat Plan
VMAs	vegetation management areas
VMP	Vegetation Management Plan
VMT	vehicle miles traveled
VTA	Valley Transit Authority

W

WFRP	Wildland Fire Resiliency Program
WHO	World Health Organization
WPS	Worker Protection Standard
WUI	wildland-urban interface

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1 Introduction

1.1 Purpose of this Program Environmental Impact Report

Midpeninsula Regional Open Space District (Midpen) proposes to implement a Wildland Fire Resiliency Program (WFRP or Program), which would serve as a planning and implementation document to manage vegetation and infrastructure on Midpen lands as well as planning, response, and monitoring to reduce wildland fire risks. This Draft Program Environmental Impact Report (Program EIR) has been prepared to evaluate the potential environmental effects of implementing the Program. This chapter provides introductory information to orient the reader to the Program and the environmental analysis.

The Program EIR has been prepared in compliance with the California Environmental Quality Act (CEQA) and the State CEQA Guidelines. CEQA requires that state and local government agencies consider the environmental effects of projects over which they have discretionary authority before acting on those projects. CEQA requires that each public agency avoid or mitigate to less-than-significant levels, wherever feasible, the significant environmental effects of projects it approves or implements. The purpose of an EIR, under the provisions of CEQA, is "to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided" (Public Resources Code [PRC] § 21002.1[a]). If a project would result in significant and unavoidable environmental impacts that cannot be feasibly mitigated to less-than-significant levels, the project can still be approved, but the lead agency's decision-maker (e.g., Board of Directors) must issue a "statement of overriding considerations" explaining, in writing, the specific economic, social, or other considerations that they believe make those significant effects acceptable (PRC § 21002; California Code of Regulations [CCR] § 15093 of the State CEQA Guidelines).

The relevant statute and regulations guiding the preparation of this Program EIR are:

- PRC §§ 21000 et seq.
- CCR, Title 14, Division 6, Chapter 3, § 15000 et seq.

This Program EIR evaluates the significant or potentially significant adverse effects on the physical environment resulting from the implementation of the Program; describes feasible measures, if needed, to mitigate any significant or potentially significant adverse effects; and considers alternatives that may lessen one or more of the significant or potentially significant adverse effects.

1.2 Scope of the Draft Environmental Impact Report

1.2.1 Program EIR Approach

This EIR has been prepared as a Program EIR. As described in State CEQA Guidelines section 15168(a)(3), a Program EIR "may be prepared on a series of actions that can be characterized as one large project and are related either:

- Geographically,
- As logical parts in the chain of contemplated actions,
- In connection with the issuance of rules, regulations, plans or other general criteria to govern the conduct of a continuing program, or
- As individual activities carried out under the same statutory authority and having generally similar environmental effects which can be mitigated in similar ways.

The use of a Program EIR can provide the following advantages. The Program EIR can:

- Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action,
- Ensure consideration of cumulative impacts that might be overlooked in a case-by-case analysis,
- Avoid duplicative reconsideration of basic policy considerations,
- Allow the lead agency to consider broad policy alternatives and program-wide mitigation measures early when the agency has greater flexibility to deal with basic problems or cumulative impacts, and
- Allow a reduction in paperwork.

A Program EIR is most helpful in addressing subsequent activities if it analyzes the effects of the program as specifically and comprehensively as possible. With a thorough analysis of the program, many subsequent activities can be found to be within the scope of the plan described in the Program EIR, and no further environmental documents are required to carry out the plan.

It is intended that this Program EIR focuses on the overall effects of the WFRP. The Vegetation Management Plan (VMP) is presented in considerable detail, and therefore, actions under the VMP are expected to proceed without further CEQA review upon certification of the EIR. The Prescribed Fire Plan (PFP) and infrastructure additions under the Wildland Fire Pre-Plans may require additional CEQA review that can be tiered from this Program EIR if the effects of these actions are not fully covered here.

1.2.2 Scope of Program EIR and Key Resource Topics Addressed

Pursuant to CEQA, the discussion of potential effects on the physical environment from the implementation of the Program is focused on impacts that may be significant or potentially significant. CEQA allows a lead agency to limit the discussion of environmental effects that are not considered potentially significant (PRC § 21100, CCR §§ 15126.2[a], and section 15128 of the State CEQA Guidelines). CEQA requires that the discussion of any significant effect on the

environment be limited to substantial, or potentially substantial, adverse changes in physical conditions that exist within the affected area, as defined in PRC § 21060.5 (statutory definition of "environment").

On April 27, 2020, Midpen issued a Notice of Preparation (NOP) (refer to Appendix 1.0) to inform agencies and the general public that a Program EIR was being prepared and invited comments on the scope and content of the document and participation at a public scoping meeting. The NOP was posted with the State Clearinghouse, on Midpen's website, and was distributed to public agencies, interested parties, and organizations.

The scope of this Draft Program EIR includes the resource topics for which potentially significant impacts could occur, as listed below. This list is based on a review of background information, comments received during the scoping process, and professional judgement.

- Aesthetics
- Air Quality
- Biological Resources
- Cultural and Tribal Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards, Hazardous Materials, and Wildland Fire
- Hydrology and Water Quality
- Noise
- Recreation
- Transportation

Areas of controversy (CEQA Guidelines section 15123 (b)) raised during scoping that are relevant to the environmental analysis are noted at the beginning of each resource section in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures of this Program EIR, as applicable. Chapter 4: Environmental Setting, Impacts, and Mitigation Measures begins with a brief description of the remaining resources for which effects were found not to be significant and further analysis is not required.

1.3 Public Review and Participation Process

1.3.1 Public and Agency Participation in Preparation of the Program

The Program development process included numerous public meetings, in-person meetings, phone calls and email feedback from partners and stakeholders, including cooperating and collaborative agencies, local fire agencies, tribes, and the public (including non-governmental organizations). The Program was reviewed by the Board's Planning and Natural Resources Committee. During the week of August 19, 2019, public meetings were held in the communities of Half Moon Bay, Los Gatos, and Woodside. The objective of these meetings was to communicate Midpen's Program components and invite early public comments on its

development. Communication with local fire departments was also a critical component of the Program development. Numerous fire departments were also contacted.

1.3.2 Scoping for the EIR Process

Consistent with the requirements of CEQA, Midpen contacted affected federal, State, and local agencies; organizations; and individuals who may have an interest in the Program. Outreach actions beyond those previously described for the development of the Program included the circulation of the NOP on April 27, 2020, as previously mentioned, issuing a press release on the public scoping meeting, and holding the public scoping meeting via teleconference on May 13, 2020.

1.3.3 Draft EIR Program Review and Public Information Meeting

Midpen has filed a Notice of Completion with the State Clearinghouse of the Governor's Office of Planning and Research, indicating that the Draft Program EIR is available for review and comment by the public. The public review period will last 45 days, beginning January 15, 2021 and ending March 1, 2021.

A public information meeting on the Draft Program EIR will be held during the review period. The meeting will be held via teleconference on February 25, 2021 at 5:00pm (as allowable by Executive Order N-25-20).

A Public Notice of Availability of the Draft Program EIR, which also includes the date, time, and format for the public meeting, has been published during early January 2021 in the San Jose Mercury News, Half Moon Bay Review, Palo Alto Weekly, The Almanac, Los Gatos Weekly Times, Saratoga News, Cupertino Courier, Sunnyvale Sun, and San Mateo County Daily News.

1.3.4 Written Comments on the Draft Program EIR

Comments on the Draft Program EIR may be made in writing before the end of the comment period (March 1, 2021). Written comments should be mailed or e-mailed to the address provided below. After the close of the public comment period, responses to the comments received on the Draft Program EIR will be prepared and published, and this Draft Program EIR will be updated with any revisions based on the response to comments, which will constitute the Final Program EIR.

Please mail, e-mail, or fax comments on the Draft Program EIR by the March 1, 2021 deadline to:

> Midpeninsula Regional Open Space District
> Attention: Coty Sifuentes-Winter, Senior Resource Management Specialist
> Mailing Address: 330 Distel Circle, Los Altos, CA 94022
> Email: csifuentes@openspace.org (Subject line: WFRP EIR Comment)
> Fax: (650) 691-0485

Hard copies of the Draft Program EIR can be reviewed at the location listed below and an electronic version can be viewed online at https://www.openspace.org/our-work/projects/wfrp.

To view the hard copies at the Administrative Office, members of the public must first call or email ahead to schedule a review time given COVID-19-related office closures and limited staff presence in the office. Midpen's COVID-19 safety protocols must be followed, including face masks and physical distancing of 6 feet, for entry into the Administrative Office and for duration of reviewing the document.

Midpeninsula Regional Open Space District Administrative Office
330 Distel Circle
Los Altos, CA 94022-1404
(650) 691-1200
Typical office hours: 8:30 a.m. to 5:00 p.m., Monday through Friday (except holidays)
Go here for directions to this office: http://www.openspace.org/contact_us.asp

The Draft Program EIR is also available at the following locations for review:

- *Seven Springs Station 2:* 21000 Seven Springs Parkway, Cupertino, CA 95014
- *Los Gatos Station 3:* 306 University Avenue, Los Gatos, CA 95030
- *Redwood Station 4:* 21452 Madrone Drive, Los Gatos, CA 95033
- *Monta Vista Station 7:* 22620 Stevens Creek Boulevard, Cupertino, CA 95014
- *Los Altos Station 15:* 10 Almond Avenue, Los Altos, CA 94022
- *San Carlos Station 16:* 1286 Alameda de las Pulgas, San Carlos, CA 94070
- *Woodside Fire Protection District Administration Office*: 808 Portola Rd #C, Portola Valley, CA 94028
- *Woodside HQ Station 7:* 3111 Woodside Road, Woodside, CA 94062
- *Woodside Station 19:* 4091 Jefferson Avenue, Woodside, CA 94062
- *Woodside Station 8:* 135 Portola Road, Portola Valley, CA 94028
- *Skylonda Station 58:* 17290 Skyline Boulevard, Woodside, CA 94062

1.3.5 Final EIR Program Review and Public Information Meeting

A public hearing to consider the Final Program EIR has been tentatively scheduled for Spring 2021. The meeting will be held via teleconference or in the Board Room of the Midpeninsula Regional Open Space District Administrative Office located at 330 Distel Circle Los Altos, CA 94022 depending on COVID-19-related shelter-in-place restrictions for public gatherings that may still be in place in Spring 2021. Notices of the upcoming meeting will be sent to all interested parties. Information about the Final Program EIR public hearing will be available online at www.openspace.org/fire.

1.4 Agency Roles and Responsibilities

1.4.1 Lead Agency

Midpen is the lead agency under CEQA, as defined in Section 15367 of the State CEQA Guidelines. The Program has been developed in collaboration and consultation with other Responsible Agencies and the general public.

1.4.2 Responsible and Trustee Agencies

Responsible and trustee agencies are consulted by the lead agency to ensure the opportunity for input during the environmental review process. Under CEQA, a responsible agency is a public agency other than the lead agency that has legal responsibility for carrying out or approving a project or elements of a project (PRC § 21069). For example, the project may be subject to the permitting requirements of the San Francisco Bay Regional Water Quality Control Board (RWQCB) or the Central Coast RWQCB for any activities that would result in discharges to waters of the State.

Under CEQA, a trustee agency is a state agency that has jurisdiction by law over natural resources that are held in trust for the people of the State of California (PRC § 21070). The California Department of Fish and Wildlife (CDFW) is a trustee agency with jurisdiction over fish and wildlife and their habitats that may be affected by the Program. Midpen also serves as a Trustee Agency, as defined by State CEQA Guidelines Section 15386 for affected resources within units of Midpen lands.

1.5 Document Organization

This Program EIR has been organized into the following chapters:

- **Acronyms and Abbreviations.** Provides a list of all acronyms and abbreviations used in the Program EIR. Refer to Appendix 1.0-2 for a glossary of key terms used throughout the Program EIR.
- **Chapter 1: Introduction.** Introduces the environmental review process; describes the purpose of the Program EIR; identifies lead, responsible, and trustee agencies; and outlines the organization of the Draft Program EIR.
- **Chapter 2: Executive Summary.** Summarizes the EIR process and the objectives of the Program, provides a brief overview of the project description, describes the Program alternatives, identifies areas of controversy, and summarizes the next steps in the public review process. The Executive Summary also contains a table that summarizes the significance of the environmental impacts that would result from the Program.
- **Chapter 3: Project Description.** Describes the background, Program location and summary of Midpen lands and existing treatments, history of fuel management on Midpen lands, need for the Program, Program objectives, and provides a detailed description of the Program, its components, and implementation.

- **Chapter 4: Environmental Setting, Impacts, and Mitigation Measures.** Summarizes effects not found to be significant. Describes the existing environmental setting (i.e., baseline conditions) and regulatory framework, presents significance criteria or thresholds for determining the significance of impacts, evaluates environmental impacts on the physical environment associated with the Program, identifies mitigation for any potentially significant and significant impacts, and identifies the level of significance following the implementation of the mitigation for all resource topics carried forward for detailed analysis.
- **Chapter 5: Other CEQA Considerations.** Discusses cumulative impacts that could result from implementing the Program in combination with other past, present, and reasonably foreseeable future programs in the area, discusses the potential for the Program to induce growth, discloses any significant and unavoidable impacts identified in the environmental impact analysis, and describes the potential for the Program to result in a significant and irreversible commitment of resources.
- **Chapter 6: Alternatives to the Program.** Describes alternatives to the Program, including the No Project Alternative and potentially feasible alternatives that would avoid, reduce, or eliminate significant impacts identified in Chapter 3: Project Description, and identifies the environmentally superior alternative. Alternatives that have been rejected from further consideration are also identified, along with an explanation of the reasons for their rejection. Impacts of alternatives are not analyzed at the same level of detail as those of the Program, consistent with the provisions of CEQA Guidelines section 15126.6(d).
- **Chapter 7: Document Preparation.** Identifies the preparers of the Program EIR and the public agencies, organizations, and tribes consulted during the preparation of the Program EIR.
- **Chapter 8: References.** Provides the references for each chapter and section.

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2 Executive Summary

2.1 Introduction

Wildland fire prevention, preparation, and response are a part of Midpen's land stewardship. California's fire season is now longer and more intense, due in part to dense regrowth of historically logged forests, more than a century of fire suppression, and a changing climate. To meet these growing challenges, Midpen is establishing this Program to allow for increased and environmentally sensitive vegetation management. The Program is designed to protect natural and cultural resources, expand landscape-level ecological resilience to changing climate and fire risk conditions, and facilitate ecologically sensitive wildland fire response and training while enhancing public safety and education.

The Program requires approval by Midpen's Board of Directors and as such, is considered a discretionary action and subject to CEQA. Midpen has determined that the appropriate environmental review document is a Program EIR, in accordance with CEQA. This Program EIR addresses the effects of the Program as specifically and comprehensively as possible. Most activities addressed in the Program EIR can be carried out upon Program approval and EIR certification by Midpen's Board of Directors. Where additional CEQA review is needed (for actions outside the scope and coverage of the analysis presented herein), the additional CEQA review can be tiered from this Program EIR.

This Program EIR has been prepared in accordance with CEQA (Public Resources Code Section 21000 *et seq.*) and the 2018 amendments to the Guidelines for the Implementation of CEQA (14 California Code of Regulations Section 15000 *et seq.*) to provide an assessment of the potentially significant environmental effects of the Program.

2.2 Program Overview

2.2.1 Program Objectives

The objectives of the Program are as follows:

1. Manage vegetation (including invasive fire-prone trees) to establish healthy, resilient, fire-dependent or fire-adapted ecosystems to further Midpen's mission to protect and restore the diversity and integrity of the ecological processes on Midpen lands and facilitate healthy post-fire recovery.

2. Integrate Native American traditional ecological knowledge practices of natural resource management, particularly as they relate to prescribed fire, that promote ecological resiliency and enhance biodiversity.
3. Manage vegetation and infrastructure on Midpen lands to reduce wildland fire risks, improve wildland fire fighting capabilities and coordination, and improve overall safety to reduce the harmful effects of wildland fire on people, property, and natural resources.
4. Provide an adaptive framework for periodic review of and revisions to Midpen decisions in response to a changing climate, improved knowledge, and improved technology. This framework also considers competing Midpen priorities, capacity, funding and fiscal sustainability, and partnerships to determine the location, scale, and timing of future vegetation management activities.

2.2.2 Program Framework

The proposed activities under the Program would be applied on all lands managed by Midpen, which covers nearly 60,000 acres of land, mostly in unincorporated portions of San Mateo, Santa Clara, and a small section of Santa Cruz counties with other land within the jurisdiction of 17 cities. The Program would serve as a planning and implementation document that fully describes and integrates four plans:

- **Vegetation Management Plan (VMP)**: Addresses creation and maintenance of fuel reduction areas (FRAs) for ecosystem health, fuel breaks, and defensible space zones using vegetation management techniques addressed in Midpen's Integrated Pest Management Program (IPMP). These techniques include manual and mechanical removal of vegetation, use of herbicides, and prescribed herbivory.
- **Prescribed Fire Plan (PFP):** Addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health.
- **Wildland Fire Pre-Plan/Resource Advisor Maps**: Describes the creation of Resource Advisor maps for each open space preserve and other managed land (or groups of managed lands) that will include information on existing conditions, infrastructure, and resources constraints. The plans with maps would aid fire suppression activities and would identify sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities.
- **Monitoring Plan:** Provides a framework for recording pre-project conditions, vegetation treatment response, and fuels inventories to inform future adaptive management techniques.

The VMP and the PFP are the plans that could result in physical effects to the environment as could some components of the Wildland Fire Pre-Plan that would involve the installation of firefighting infrastructure on Midpen lands.

A detailed description of the Program components is included in Chapter 3: Project Description of this document.

2.3 Summary of Environmental Impacts and Mitigation Measures

This Program EIR has been through extensive environmental evaluation. Issues were raised by the public and resource agencies during scoping. This document focuses primarily on key issues where potentially significant impacts from implementation of the Program could occur. Resources for which there are no impacts or less than significant impacts are therefore excluded from detailed analysis as described in Chapter 4: Environmental Setting, Environmental Impacts, and Mitigation Measures. Key issues are discussed in each resources section in Chapter 4: Environmental Setting, Environmental Impacts, and Mitigation Measures. Table 2.1-1, located at the end of this chapter, provides a summary of the Program's potential environmental impacts, level of significance before mitigation, recommended mitigation measures, and the level of significance after the application of mitigation measures.

2.4 Summary of Project Alternatives

CEQA Guidelines Section 15126.6, as amended, mandates that all EIRs include a comparative evaluation of the proposed project with alternatives to the project that are capable of attaining most of the project's basic objectives but would avoid or substantially lessen any of the significant effects of the project. CEQA requires an evaluation of a "range of reasonable" alternatives, including the "no project" alternative. Chapter 6: Alternatives, provides an analysis of the comparative impacts anticipated from the four alternatives to the Program, including:

1. **No Program Alternative.** While this alternative does not meet Program objectives, it must be evaluated under CEQA. This alternative includes continuing existing vegetation management activities. No prescribed burning and no expanded activities under the VMP would be performed. This alternative would reduce direct, significant WFRP impacts to air quality and GHG emission impacts, soil erosion impacts, water quality impacts, and impacts on special-status species and communities, primarily because significantly less work and no prescribed burning would occur.
2. **No Prescribed Fire Plan Alternative.** This alternative would involve removal of the PFP from the Program, and no prescribed burning would be implemented. Pile burning under the VMP would still be allowed. This alternative would reduce significant and unavoidable impacts from criteria pollutant and GHG emissions of the Program.
3. **Reduced Program Alternative – Reduced Acreages of Vegetation Management Areas for Fire Management.** This alternative would include a plan to reduce the distances from resources used to develop vegetation management areas (VMAs) for fire management, thereby reducing the acreages that could be treated. This alternative would reduce overall impacts to any resources for which the VMP would have an impact, such as impacts to biological resources (rare plants, special-status species habitat, sensitive communities), cultural resources, hydrology, visual resources, and others, although the level of impacts may still require mitigation.

4. **Reduced Program Alternative – No Acacia or Eucalyptus Removal and Limit Treatments in Sensitive Communities to Fuel Reduction Areas.** This alternative would eliminate the acacia and eucalyptus removal and would include only FRA-level work in any sensitive community. Some potentially significant and unavoidable visual impacts from removal of eucalyptus and acacia would be avoided; however, other significant unavoidable visual impacts from creation of VMAs and installation of firefighting infrastructure could still occur. Potential impacts to special-status butterflies and raptors associated with eucalyptus could be reduced, as well as other impacts such as erosional impacts, and slope stability impacts. Impacts to identified sensitive communities would also be reduced (but not eliminated) by reducing the extent of work that would occur within these communities.

2.5 Significant and Unavoidable Environmental Impacts

Detailed mitigation measures are identified in the resources section within Chapter 4: Environmental Setting, Environmental Impacts, and Mitigation Measures, that are intended to mitigate project effects to the extent feasible. These mitigation measures are provided in Table 2.1-1. After implementation of the mitigation measures, nearly all of the adverse effects associated with the Program would be reduced to a less-than-significant level. However, the Program would result in potentially significant and unavoidable impacts from generation of criteria air pollutant and greenhouse gas (GHG) emissions, primarily from prescribed burning and potentially significant visual impacts from vegetation thinning and tree removal, as viewed from scenic viewpoints, trails, corridor's or roads.

2.6 Areas of Controversy and Issues to be Resolved

Section 15123 of the CEQA Guidelines requires the summary section of a Draft EIR to identify areas of controversy known to the Lead Agency, including issues raised by agencies and the public, and issues to be resolved. The comment letters received on the Notice of Preparation (NOP) are included in Appendix A of this document. Key areas of controversy or environmental concerns were expressed over:

- **Alternatives:** Defining a range or certain alternatives to the Program, including an alternative that includes extensive mowing versus prescribed burning or prescribed herbivory;
- **Biological Resources**:
  - Identifying the potentially significant impacts to biological resources, particularly listed or protected species and balancing vegetation management actions against species impacts;
  - Addressing habitat fragmentation and connectivity;
  - Addressing impacts to sensitive habitats from expansion of invasive species from Program activities; and

- **Geology and Soils:** Addressing how fire management actions could impact slope stability and induce landslides and mitigating for any associated effects.

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Table 2.1-1 Summary of Impacts and Mitigation Measures

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.2 Aesthetics			
Impact Aesthetics-1: Substantial impact on a scenic vista, or substantial degradation of the existing visual character or quality of public views of the site and its surroundings. Vegetation and fuel management activities are currently one component that shapes the visual appearance of Midpen lands. Implementation of the Program would increase the extent of vegetation management areas and the intensity of treatments performed each year. The tools and techniques proposed under the Program have all been used before on Midpen lands but at a lower intensity than is proposed under the Program. Numerous scenic trails, corridors, roads, and viewpoints are located within the OSPs and the visual quality and viewer sensitivity to change throughout most OSPs is therefore high. Temporary visual degradation could occur in some areas during implementation of vegetation management activities, particularly for mowing or from smoke from large-scale prescribed burns. These short-term impacts, however, would be localized and small in scale, and as such are considered to have a less than significant impact on visual character and quality of public views. Over the long-term, implementation of the proposed Program activities and plans would result in landscapes that generally replicate already existing visual qualities and patterns on Midpen lands and in the region, but with a managed appearance. Potentially significant visual impacts could occur while work is being performed. The loss or alteration of eucalyptus trees and existing forest density, as viewed from scenic areas, could be considered a degradation of the existing visual character. Construction dust would be visible from roads and trails. New infrastructure under the Wildland Fire Pre-Plans could be visible from scenic vistas and trails resulting in a substantial change to the visual character of an area. Implementation of MM Air Quality-1 and MM Aesthetics-2 would likely reduce impacts to less than significant levels by requiring guidelines for the design of roads, landing zones, and staging area or other structures, and requiring grading activities to implement fugitive dust controls, but occasionally, it may not be possible to avoid placing an important new road, staging, or helicopter landing area adjacent to a scenic trail or viewpoint where it could degrade visual quality. Impacts to visual quality and scenic views would be significant and unavoidable in some areas where FRAs, prescribed burn activities, or infrastructure are visible from scenic roads or vistas.	Potentially significant	**MM Aesthetics-1: Reduction of Visual Impacts from Scenic Roads, Corridors, Trails, and Viewpoints from VMAs** • Midpen shall conduct a visual reconnaissance of any planned VMAs during the annual planning process, prior to implementation of the VMA. The reconnaissance shall only apply to VMAs, based on desktop review, that could have the potential to be visible from a designated scenic road, corridor, trail, or viewpoint. • If Midpen identifies that a VMA would fall within an area with lengthy views from a scenic road, corridor, trail, or viewpoint (i.e., longer than a few minutes) of a proposed treatment area, and would degrade the view by changing the existing character or opening up a less scenic view, Midpen will, before implementation, identify any change in location or design (such as avoid areas or reduce degree of thinning) of the VMA to reduce impacts to scenic areas and public views. • If no changes are available that would reduce impacts to public viewers and that could achieve the intended wildland fire risk reduction objectives of the proposed treatment, Midpen will thin and feather adjacent vegetation to break up the linear edges of treatment areas and strategically preserve vegetation at the edge of the treatment area to help screen public views and minimize the contrast between the treatment area and surrounding vegetation. **MM Aesthetics-2: Guidelines for Design of Roads, Landing Zones, or Staging Areas** New roads, landing zones, and staging areas (firefighting infrastructure) shall be designed in accordance with the following guidelines, as feasible: • Locate new firefighting infrastructure away from ridgelines. • Maximize natural conditions of the area surrounding infrastructure (e.g., mowed grass cover versus hardened surface). • Minimize recontouring of hills and natural topography. • Minimize hillside cuts that run against the contours; follow contours to the greatest extent possible. • Avoid large rocks and mature, healthy trees. **MM Air Quality-1: Fugitive Dust Control Measures for Infrastructure Installation (see Section 4.3: Air Quality below)**	Potentially significant and unavoidable
Impact Aesthetics-2: Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. The proposed Program would involve wildland fire management activities across Midpen lands and in many cases scenic resources, including historic structures, unique rock outcroppings, and trees, are viewable from State scenic highways. MM Aesthetics-1 would be implemented to assess and reduce visual impacts in State scenic highway corridors, but it may not be feasible to implement it in all areas. Prescribed burns would change the density of vegetation and color of the landscape to dark gray/black, the burns could still significantly degrade the visual character or quality of views from the State scenic highway until successional vegetation reestablishes. Where new firefighting infrastructure could impact a scenic area, MM Aesthetics-2 would be applicable and would likely reduce impacts to less than significant in the majority of cases, but occasionally, it may not be possible to avoid placing an important new road, staging, or helicopter landing area adjacent to a scenic trail or viewpoint where it could degrade visual quality. Impacts, in those rare instances, may be significant and unavoidable.	Potentially significant	**MM Aesthetics-1: Reduction of Visual Impacts from Scenic Roads, Corridors, Trails, and Viewpoints from VMAs** **MM Aesthetics-2: Guidelines for Design of Roads, Landing Zones, or Staging Areas**	Potentially significant and unavoidable

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact Aesthetics-3: New source of substantial light or glare that would adversely affect day or nighttime views in the area. Implementation of the Program would not include new, permanent lighting. Temporary lighting could be used during installation of new firefighting infrastructure in the early morning and evening. Glare from equipment and new firefighting infrastructure is not anticipated. Impacts from light or glare would be less than significant.	Less than significant	No mitigation measures are required.	N/A
		4.3 Air Quality	
Impact Air Quality-1: Conflict with or obstruct implementation of the applicable air quality plan. As discussed below in Impact Air Quality-2, implementation of the Program, prescribed fire and pile burning specifically, could exceed Bay Area Air Quality Management District (BAAQMD) criteria pollutant thresholds identified to achieve the goals of the 2017 Clean Air Plan (CAP) and could exceed Monterey Bay Air Resources District (MBARD) criteria pollutant thresholds identified to achieve the goals of the 2012-2015 Air Quality Management Plan (AQMP). Prescribed burn emissions would likely exceed pollutant thresholds established by BAAQMD and MBARD, in part to achieve the goals of the 2017 CAP and 2012-2015 AQMP. MM Air Quality-1 requires implementation of fugitive dust controls and MM Air Quality-2 requires implementation of measures to minimize prescribed burn and pile burn emissions. The potential impacts associated with dust would be reduced to less than significant with implementation of MM Air Quality-1. The impacts associated with burning vegetation is potentially significant and unavoidable after implementation of MM Air Quality-2.	Potentially significant	**MM Air Quality-1: Fugitive Dust Control Measures for Infrastructure Installation** At a minimum, the following control measures must be implemented during construction: • When moisture content is low enough to create dust, all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered or treated with a non-synthetic dust palliative (e.g., organic nonpetroleum products) as often as needed to control dust emissions. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • Vehicle ingress and egress locations shall be stabilized to minimize erosion and sediment transfer. • For Program activities involving grading or excavation conducted directly off public roads, all visible mud or dirt track-out onto adjacent public roads shall be removed. The use of dry power sweeping is prohibited on public roads. • All vehicle speeds on unpaved roads shall be limited to 15 mph, in accordance with Midpen policy (LU Regulations Section 500.1; MO Manual 07.005). • All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • A publicly visible sign shall be posted with the telephone number and person to contact at Midpen regarding dust complaints. Midpen shall respond and take corrective action within 48 hours. The applicable air district's (e.g., BAAQMD or MBARD) phone number shall also be visible to ensure compliance with applicable regulations. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, § 2485 of CCR). Clear signage shall be provided for construction workers at all access points. • Construction equipment shall be properly maintained by a certified mechanic.	Potentially significant and unavoidable due to prescribed burn emission exceedances
		MM Air Quality-2: Burn Emission Reduction Techniques (see below)	
Impact Air Quality-2: Net increase of a criteria pollutant for which the program region is in non-attainment under an applicable federal or state ambient air quality standard. Use of manual and mechanical methods, prescribed burning, prescribed herbivory, and vehicles and equipment during vegetation management activities would generate exhaust emissions. Fugitive dust would be generated from equipment and vehicle use on paved and unpaved roads, and from ground disturbing activities. Prescribed burning would emit particulate matter emissions from combustion of vegetation. Estimated emissions during implementation of the Program would exceed the numerical significance thresholds for particulate matter (PM_{10} and $PM_{2.5}$) and ozone precursors (NOx and ROG) set by BAAQMD, and exceed the numerical significance thresholds for ozone precursors (NOx and ROG) identified by MBARD (Table 4.3-7). The Program's impacts on criteria pollutants would be potentially significant. MM Air Quality-2 requires consideration and implementation of measures to minimize prescribed burn and pile burn emissions, when and where appropriate. The impact would remain potentially significant and unavoidable.	Potentially significant	**MM Air Quality-2: Burn Emission Reduction Techniques** For activities within a small portion of Long Ridge OSP and a very small portion of Sierra Azul OSP that falls within the NCCAB, Midpen shall limit pile burning to 8.8 tons (i.e., not more than nine 10-foot-wide by six-foot-high parabolic piles of shrub/hardwood vegetation or equivalent) in any one day. Midpen shall incorporate the following measures during planning and implementation of a prescribed burn, where feasible: • When considering a prescribed burn, weigh the habitat benefits of burning in a particular vegetation type against the emissions. • Reduce the total area burned through mosaic burning. • Burn when fuels have a higher fuel moisture content. • Reduce fuel loading by decreasing the density of vegetation and other fuels before ignition using mechanical treatments, manual treatments, prescribed herbivory, and pile burning. • Schedule burns before new vegetation growth, increasing fuel loads. • Delay planned burns when a Spare the Air Burn Ban has been declared.	Potentially significant and unavoidable due to prescribed burn emission exceedances

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact Air Quality-3: Exposure of sensitive human receptors to substantial pollutant concentrations. Use of vehicles and equipment during Program activities could disturb serpentine soil, potentially exposing individuals to asbestos. Prescribed and pile burn activities would release smoke, which could expose workers, recreationalists, and the public to toxic air contaminant (TAC) emissions, including $PM_{2.5}$. Prescribed burning has the potential to expose Midpen employees to levels of acrolein, formaldehyde, respirable particulate matter, and high levels of CO concentration that could impact their health. Smoke could blow towards nearby homes, affecting sensitive receptors' health (including eye and lung irritation). MM Air Quality-3 requires watering of areas proposed for ground disturbing activities in serpentine soils. MM Air Quality-4 requires use of real-time CO monitors, rotation of personnel out of heavy smoke, and strategically-placed firefighters and fire lines where smoke exposure is less. MM Hazards-3 requires closure of trails and Midpen-owned roads within at least 500 feet of the edges of a prescribed burn area for safety reasons. Implementation of these measures would reduce impacts on sensitive receptors; however, impacts could remain significant. Despite adherence to burn-specific plans and regulations, smoke generated by each prescribed burn conducted under the Program may not behave as predicted and could expose sensitive receptors (including nearby residences) to TAC emissions and short-term health risks. The impact on sensitive receptors from prescribed burning would be potentially significant and unavoidable.	Potentially significant	**MM Hazards-3: Safety Around Prescribed Burns (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire below)** **MM Air Quality-3: Asbestos Management** Prior to conducting any activities requiring manual soil-disturbing activities (e.g., pulling of vegetation or trenching), use of mechanical equipment (e.g., skid steer loader or backhoe), or off-road access to a work site, consult the map created using GIS that shows where serpentine soils and rock formations are located. If the work site or temporary access route passes through an area with serpentine soils or rock formations, implement the asbestos-management measures (below), developed based on CARB Asbestos Airborne Toxic Control Measures developed for construction and grading operations. Asbestos Management Measures: • Areas known to have asbestos shall be watered during ground-disturbing activities (e.g., pulling of medium-to-large vegetation, digging large holes for planting) to ensure that the soil remains moist during the extent of the activity. • Avoid or minimize the tracking of dust into vehicles. • Do not use compressed air for cleaning your vehicles after your visit. Use a wet rag to clean the interior. • All vehicle speeds on unpaved roads shall be limited to 15 mph, in accordance with Midpen policy (LU Regulations Section 500.1; MO Manual 07.005). • When mowing in serpentine soils, the mower head shall be set at least 6 inches above the ground to minimize asbestos dust generation. If when mowing, dust is seen from the mower pluming more than 4 feet above the ground surface, the mower shall be adjusted to the minimum height needed to avoid generating dust plumes. **MM Air Quality-4: Midpen Employee Protection from Prescribed Burn Air Pollutants** Midpen shall require that prescribed burns on Midpen lands are managed to reduce Midpen employee exposure to CO concentrations and other air pollutants through implementation of the following measures: • Use real-time CO monitors. • Train workers to be aware of smoke hazards associated with prescribed and pile burns. • Rotate personnel out of heavy smoke areas and routinely monitor for smoke exposure during burn events. • Avoid burning heavy fuel loads, such as large logs, on the ground to avoid additional mop up. • Strategically place firefighters and fire lines where smoke exposure is less. • N95 or N100 dust masks, or bandanna shall be available for voluntary use and must be used when recommended by the Burn Boss.	Potentially significant and unavoidable due to prescribed burns
Impact Air Quality-4: Emissions (such as those leading to odors) adversely affecting a substantial number of people. Diesel exhaust from equipment and vehicles as well as volatile organic compounds emitted during painting or paving, if needed for firefighting infrastructure, would generate some odors. Odors could temporarily increase in the immediate vicinity of the equipment operation. Smoke from pile and prescribed burning could affect a substantial number of people under certain circumstances, including workers, recreationalists, and residences. Preparation and implementation of a Burn Plan and Smoke Management Plan would minimize smoke from prescribed burns in areas of substantial numbers of receptors by ensuring that prescribed burns are conducted under optimal weather conditions. Implementation of MM Hazards-3 would reduce impacts from other emissions, however, impacts could remain significant from smoke generated by prescribed burns. With mitigation and adherence to regulations, a substantial number of people would typically not be subjected to objectionable smoke, but due to the unpredictability of smoke, the impact would remain potentially significant and unavoidable.	Potentially significant	**MM Hazards-3: Safety Around Prescribed Burns (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire below)**	Potentially significant and unavoidable due to smoke from prescribed burns

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.4 Biological Resources			
Impact Biological Resources-1: Substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. Vegetation management activities implemented under the Program could result in direct or indirect adverse effects to special-status plant and special-status wildlife species, and their habitats. Pre-treatment surveys would be required to identify the presence of special-status plants and their habitats under existing best management practices (BMPs) and conditions. MM Biology-1 identifies training, monitoring, and reporting requirements. MM Biology-2 addresses impacts to special-status plants through pre-activity surveys, avoidance, or implementation of minimization measures for any plants found. MM Biology-3 requires compensatory mitigation for permanent impacts on special-status plants, if impacts cannot be avoided or minimized under MM Biology-2. MM Biology-4 and MM Biology-5 require Midpen to implement techniques to minimize the spread of invasive species and forest diseases, including expansion of IPMP's Early Detection and Rapid Response (EDRR) program to VMAs. MMs Biology-6 through 15 require specific species protection avoidance and minimization measures, and, for certain species, compensatory mitigation requirements for habitat conversion. Implementation of these measures would reduce impacts on special-status plants and wildlife and their habitats to less than significant.	Potentially significant	**MM Geology-1: Prescribed Herbivory Land and Trail Control (see Section 4.6: Geology and Soils below)** **MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils below)** **MM Geology-3: Fire Lines During Prescribed Burns (see Section 4.6: Geology and Soils below)** **MM Biology-1: Training, Monitoring, and Reporting** **Monitoring** • The biological monitor(s) or qualified biologist(s) shall have the authority to stop Program activities to avoid take or impacts to special-status species or protected biological resources; in the event of unforeseen circumstances (e.g., unanticipated impacts are occurring); or if Program personnel are not complying with regulatory permit conditions and the BMPs listed herein. The biological monitor or qualified biologist shall possess the necessary agency approvals or permits required for involvement in Program activities. • A **biological monitor** is an individual who has a minimum of 2 years academic and 1 year professional experience in biological sciences and related resource management activities, is able to identify species that may be present within the work area, and is familiar with the habits and behavior of those species. • A **qualified biologist/botanist** is an individual who has a minimum of a 4-year academic degree in biological sciences or related resource management activities, with a minimum of two survey seasons years (e.g., two seasons during the blooming season of sensitive plants) conducting surveys for each species that may be present within the work area. • A **professional biologist/botanist** is an individual who has a minimum of 5 years of academic training in biological sciences or related studies and 3 or more years of professional experience conducting protocol-level wildlife and/or florist field surveys. • A **Midpen-approved biologist/botanist** is an outside consultant who has been approved by Midpen either by a professional biologist/botanist, Resource Advisor, or other appropriate individual, to conduct biological monitoring and surveying activities. This individual can be any one of the three categories of biologist/botanist described above. • A **Resource Advisor** is an individual who provides professional knowledge and expertise for the protection of resources (e.g., biological and cultural resources), within an emergency incident environment. • The qualified biologist or biological monitor shall conduct on-site monitoring of Program activities that have the potential to impact sensitive biological resources. The monitoring requirements (e.g., frequency and duration) shall depend on the specific activity(ies) being performed and the ecological sensitivity of the site (e.g., the potential for soil erosion or occurrence of special-status wildlife). Some activities shall warrant full-time monitoring by one or more biologists and/or biological monitors; whereas weekly site inspections may be sufficient for other activities. At a minimum, monitoring shall be conducted frequently enough to ensure compliance with permit conditions and BMPs. The monitor shall maintain a log that documents: (a) the monitoring dates, (b) areas and activities monitored, (c) compliance with permit conditions and BMPs, (d) any remedial actions that were taken (or are needed). • Post-activity monitoring shall also occur, with the scope and timing dependent on the potential for risks to biological resources. The purpose of monitoring is to ensure that special-status plant species and sensitive communities were avoided and are not experiencing negative indirect impacts from activities. If negative impacts are observed or are potentially occurring, restoration measures shall be implemented, and modifications made to future activities to avoid similar impacts. **Pre-Activity General Survey and Flagging** A qualified biologist or biological monitor working under a qualified biologist shall survey all selected work areas shortly before work to assess general conditions and determine environmental considerations as required by IPMP BMPs 21 and 25.	Less than significant

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Prior to Program activities, the biologist or biological monitor shall use flagging (or other methods) to clearly delineate the work area and any areas that shall be avoided (e.g., sensitive communities, habitat for special-status species).

Reporting

Information on new localities or sightings for special-status species shall be reported to the Sacramento USFWS Office and the California Natural Diversity Database (CNDDB) annually. Information on any incidental capture, injury, or mortality of special-status species shall be immediately reported within 3 working days of their discovery or in accordance with the federal and State permit conditions. The data shall also be logged in Midpen's electronic inventory system identified in IPMP BMP 25.

Training

- Prior to commencing a Program activity, all personnel shall attend a worker environmental awareness training program conducted or prepared by the qualified biologist or biological monitor working under a Midpen-approved biologist as required by IPMP BMP 21.
- The worker environmental awareness training will include a brief review of the life history, field identification, and habitat requirements of each special-status species that could potentially be present on-site, their known or probable habitat types and locations, potential fines for violations, avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered, as required by IPMP BMP 21. In addition, the training shall include information on:
  - All BMPs, regulatory permit conditions, exclusion areas, and other work restrictions.
  - Color coding for flagging used to demarcate work areas, staging areas, skid trails, watercourses, and exclusion zones (e.g., around special-status plants and other sensitive biological resources).
  - The identification and reproductive biology of invasive plants.
  - *Phytopthora ramorum* and other plant pathogens avoidance.

General Wildlife Protection Measures

- Qualified biologists/biological monitors shall check for any reptiles, amphibians, or other animals under vehicles and equipment parked for more than 30 minutes.
- Some individual live, dead, or dying trees shall be retained as snags where recommended by the qualified biologist and biological monitor and where leaving the tree would not increase fire hazards or be a safety concern.
- Vehicles traveling to and from the work areas off of established roads and trails, in sensitive plant or wildlife habitat, must travel slowly (5 mph) and be preceded by a monitor to ensure that wildlife shall not be run over by the passing vehicle. Vehicle monitors do not need to be trained biologists.
- Qualified biologists/biological monitors are required to temporarily stop any work that they believe may harm special-status species. Work shall not resume until a satisfactory method is agreed upon to minimize or avoid take of the species.
- Qualified biologists/biological monitors may require staging areas or stockpiled equipment/materials to be fenced with USFWS and/or CDFW-approved exclusion fencing if there is potential for special-status species to enter the areas and become entrapped, and routine inspection of the area is not adequate to ensure that species are not present. Fencing shall be inspected by a qualified biologist/biological monitor and maintained daily as needed to ensure its proper function in excluding wildlife. Large-scale fencing around entire vegetation management areas is discouraged due to the habitat disruption associated with fence installation and removal.

MM Biology-2: Special-Status Plants

Pre-Activity Special-Status Plant Survey

As required by IPMP BMP 25, a biological monitor or qualified biologist shall survey the work site to determine the potential presence of special-status plants (as defined under Section 4.4.2 in the Program EIR) and document any observations. The

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

abundance and spatial distribution of all special-status plants and sensitive natural communities detected during the surveys shall be recorded with a GPS unit and entered online into the CalFlora and Midpen's GIS databases. This information shall also be submitted to the CNDDB, per MM Biology-1. If any special-status plants are found to occur in the activity footprint, the biologist/botanist shall evaluate the potential level of impacts the activity could have on the plant species, either an individual or population, based on its biology and the nature of the activity (no impact, low impact, or moderate/high impact). Activities with no or low impact can proceed. If an activity could have a moderate or high impact (e.g., anticipated mortality) Midpen shall consult with CDFW and the appropriate avoidance or minimization measures would be implemented, depending on the species' rank, physiology, and habitat requirements, as described below.

Species to Avoid (Unless Population Could Benefit from Program Activity, such as Prescribed Burning)

Program activities shall avoid impacts to State or federally listed plants that are known to occur or have the potential to occur on Midpen lands:

- Ben Lomond spineflower
- Butano Ridge cypress
- California seablite
- Coyote ceanothus
- Crystal Springs fountain thistle
- Dudley's lousewort
- Marin western flax
- Metcalf Canyon jewelflower
- Monterey spineflower
- Pacific Grove clover
- Robust spineflower
- Rock sanicle
- San Francisco popcornflower
- San Mateo thorn-mint
- San Mateo woolly sunflower
- Santa Clara Valley dudleya
- Santa Cruz cypress
- Santa Cruz tarplant
- Santa Cruz wallflower
- Scotts Valley polygonum
- Scotts Valley spineflower
- Two-fork clover
- White-rayed pentachaeta

In addition, Program activities shall avoid impacts to the following species that (a) have very specific habitat requirements that are hard to replicate at a mitigation site; (b) are difficult to transplant or propagate; or (c) have insufficient data on the ability to successfully transplant, relocate, or reintroduce the taxa:

- Anderson's manzanita
- Kings Mountain manzanita
- Clustered lady's-slipper
- Mountain lady's-slipper
- Loma Prieta hoita
- Arcuate bush-mallow
- Most beautiful jewelflower

Activities that could have a moderate or high impact on these species shall not occur within an appropriate buffer (as determined by a qualified biologist/botanist or biological monitor working under a qualified biologist) of any individuals or populations identified. Disclines or firefighting infrastructure shall be relocated to avoid any populations of these species.

Prescribed herbivory and prescribed burning shall be allowed in the habitats for these species if, in the professional opinion of a qualified biologist/botanist or biological monitor working under a qualified biologist, the activity shall provide a long-term benefit to the plant (e.g., by eliminating non-native plants).

Minimization of Impacts for All Other Special-Status Species

Midpen shall implement the following approach for all other special-status plant species that have been detected, or that are detected in the Program area during the pre-activity surveys conducted per MM Biology-1 (adding specificity to IPMP BMP 21, which requires developing site-specific measures):

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

- A qualified biologist/botanist or biological monitor working under a qualified biologist shall recommend spatial buffers or other management actions. The buffer size needed to protect a special-status plant from adverse edge effects (indirect impacts) is dependent on the specific species, threats to the species, existing disturbances, and the habitat's permeability to those threats (CBI 2000). Midpen shall implement the botanist's recommendations. Impacts to a special-status plant shall only occur if it is the botanist's professional opinion that the impact shall provide a long-term benefit to the plant (e.g., by eliminating non-native plants or another threat to the species). If Midpen is unable to implement the botanist's recommendations, or if there is uncertainty regarding the effects of a Program activity on the special-status plant population, Midpen shall assess subsequent effects on the plant population through post-activity monitoring. If the monitoring indicates the Program activity has negatively impacted the plant population, the compensatory mitigation terms of MM Biology-3 shall apply. If the monitoring indicates the effects were positive or neutral, no additional mitigation is required.
- If Program activities are proposed to be conducted in habitat for a special-status plant, the activities shall be conducted during the phenological stage least sensitive to disturbance, based on guidance from the botanist.
- If Program activities are proposed to be conducted in habitat for a special-status plant, and the work must be conducted when the plant is sensitive to disturbance (e.g., during the growing season), Midpen shall assume the plant could be permanently impacted and shall either:
  - 1a. Monitor the response of the plant post-construction. If the study indicates the Program activity has negatively impacted the plant population, the terms of MM Biology-3 shall apply.
  - 1b. Attempt to salvage any special-status plants that are permanently impacted by a Program activity (e.g., plants within a proposed discline). Salvaged plants (and seeds) shall be used for the compensatory mitigation required under MM Biology-3, and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. Any supplemental plants (or seeds) needed for a mitigation project, site rehabilitation, or other application shall be derived from locally appropriate genetic material and nurseries that comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible; or
  - 2. Provide compensatory mitigation in accordance with the terms of MM Biology-3.

General Minimization and Avoidance Measures

Burn piles shall not be located within 50 feet of a special-status plant except those species that a qualified biologist/botanist or biological monitor working under a qualified biologist determines shall benefit from burning (e.g., Kings Mountain manzanita). Propane flaming shall not be conducted within the vicinity of special-status plants that could be accidentally damaged by the flaming activities. Vegetative debris shall not be placed on top of special-status plants, unless the biologist/botanist determines this is acceptable.

MM Biology-3: Compensatory Mitigation for Impacts to Special-Status Plants

Midpen shall provide compensatory mitigation for any special-status plant population that is permanently and negatively impacted by Program activities (i.e., could not be avoided or benefited through activities and subsequent monitoring determines an adverse effect to the population where a decline in the population is attributable to the Program activities, per MM Biology-2). Compensatory mitigation may be accomplished through habitat preservation, creation, restoration, or enhancement as determined appropriate by Midpen's qualified biologist/botanist or biological monitor working under a qualified biologist, in consultation with CDFW. All compensatory mitigation projects shall include a mitigation plan outlining the strategy, and the plan must be approved by CDFW, including identification of the success thresholds established depending on the population and site conditions.

The compensation ratio for planting shall be no less than 3:1 (plants at mitigation site/plants at impact site). Under some circumstances a higher ratio may be needed, which shall be determined by Midpen's qualified biologist/botanist or biological monitor working under a qualified biologist, in consultation with CDFW.

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If habitat enhancement is selected, the compensation ratio shall be no less than 6:1. If possible, compensatory mitigation shall occur on lands under Midpen's control. Mitigation sites on Midpen land shall include provisions for protecting them from impacts caused by other projects or programs (existing and future). Compensatory mitigation shall not be allowed on lands outside of Midpen's control unless those lands have a legally enforceable mechanism that ensures they shall be protected and managed in perpetuity for the benefit of the target species (i.e., special-status plant requiring mitigation). Midpen shall hold responsibility for the success of mitigation projects conducted on lands outside of its control, unless mitigation is accomplished through an approved program (i.e., mitigation bank or in-lieu fee program).

Midpen shall apply the monitoring methods outlined in the Monitoring Plan of the Program to monitor the success of compensatory mitigation projects. To account for natural variability in the size of plant populations, Midpen shall also monitor a nearby reference population. Midpen shall prepare annual monitoring reports that document the monitoring methods and results. Monitoring reports shall be submitted to CDFW. Monitoring of compensatory planting shall be conducted for at least 5 years. If after 3 years, monitoring has determined that the planting success standards are met, the report shall make this determination and monitoring may cease. Monitoring of compensatory habitat enhancement shall be conducted for at least 1 year, after which time if the success standards are met, no further monitoring is required.

A mitigation project shall be considered successful if during the monitoring period, the qualified botanist or biological monitor working under a qualified biologist, determines the success threshold has been achieved. The success threshold may be adjusted downward commensurate with any decline observed at the reference population. For example, if a special-status species is detected in a planned work area, and Midpen is unable to reconfigure the treatment or treatment method to avoid impacts to the species, Midpen shall count the number of plants in the work area and at a nearby reference population. The compensation requirement shall be based on the number of plants impacted by the treatment, whereas the number of plants at the reference site shall serve as the baseline for evaluating natural fluctuations in the population. For example, if 100 plants of a given special-status species are located in the work area, the compensation requirement is 300 plants. However, if during the final 2 years of mitigation monitoring the reference population has 20 percent less plants than the baseline value, the threshold for success at the mitigation site shall also be 20 percent less (240 plants, assuming the success threshold was set to 300 plants).

To facilitate the likelihood of success, Midpen shall:

- Ensure materials used for plant establishment (e.g. seed sources, container plantings) are sourced from genetically appropriate material and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. Container plants shall only be sourced from a nursery that complies with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible.
- Maintain less than 10 percent cover of invasive plants at the mitigation site until the target species has successfully established. Thereafter, Midpen shall conduct invasive plant removal on an as-needed basis.
- Implement measures (e.g., close restoration areas, install signage) to restrict public access within mitigation zones, at least until the target species has successfully established.
- Conduct visual inspections of the mitigation site to identify any major problems (e.g., unauthorized trespass) requiring remedial actions. The frequency of visual inspections shall be commensurate with threats to the ecological integrity of the site. The site shall be inspected annually until the success criteria of the permitting agencies (e.g., CDFW) are met, after which the site shall be monitored in accordance with Midpen's Monitoring Plan for the WFRP.

MM Biology-4: Invasive Plants and Soil Pathogens

General Invasive Plant Measures

In addition to Midpen's standard invasive species practices under the IPMP (i.e., IPMP BMPs 11 through 18), Midpen shall implement the following invasive plant measures:

- Data on populations of invasive weed species in the work area and along access roads shall be collected and reviewed prior to implementation of the Program activity. Data shall include the distribution, abundance, and seral stage of invasive

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

weed species. Pre-activity general surveys conducted according to MM Biology-1 shall be designed to detect all weeds on the CDFA noxious weed list, and Cal-IPC species with a rank of High and Moderate.

- Invasive weed species that occur within or immediately adjacent to the boundaries of proposed treatment areas shall be removed prior to the treatment—unless the treatment has been specifically designed to control or eliminate those species. For example, yellow star thistle removal shall not be required for a grazing treatment designed to control yellow star thistle. Midpen shall identify the appropriate disposal location for weeds that are removed. In determining the disposal location, Midpen shall assess the potential for spread of plant pathogens that might be present.
- Schedule activities to maximize the effectiveness of control efforts and minimize introduction and spread of invasive plants (e.g., install and maintain fuelbreaks, disclines, and other VMAs before non-native plants set seeds).
- Implement vegetation methods favorable to native plants.

Prescribed Fire and Planning Invasive Plant Measures

- A qualified biologist/botanist or biological monitor working under a qualified biologist shall evaluate the likely effects of a prescribed burn on invasive species in the proposed burn area based on the species that are known to occur in the area or that are found during the pre-activity survey (MM Biology-1). If the burn might promote spread of an invasive species, Midpen shall implement measures (e.g., manual treatments) to proactively reduce the threat or invasive species spread following the burn.
- A qualified biologist/botanist or biological monitor working under a qualified biologist shall assess the effects of the burn to determine whether revegetation is needed in any areas to speed recovery of the desired plant community.
- A qualified biologist/botanist or biological monitor working under a qualified biologist shall monitor vegetation recruitment on control lines. If vegetation recruitment is not on a trajectory for restoration of the impacted community, Midpen shall implement remedial measures such as planting or seeding.
- An interdisciplinary team shall determine when activities (including conservation grazing and public access) may resume in burned areas. The team shall include natural resource staff knowledgeable about invasive plants.

General SOD and Soil *Phytopthoras* Measures

Midpen shall implement the latest BMPs recommended by the California Oak Mortality Task Force (2020) and the Phytophthoras in Native Plant Habitats Work Group, as determined appropriate by the qualified biologist/botanist or biological monitor working under a qualified biologist.

MM Biology-5: Invasive Plant Detection and Response

Early Detection and Rapid Response

Midpen shall conduct routine monitoring of work areas (e.g., VMAs, prescribed burn areas) in accordance with the Early Detection Rapid Response (EDRR) Protocol and the IPMP (generally every 3 to 5 years). If invasive or potentially invasive species are detected, Midpen shall conduct rapid response dependent upon the circumstances and according to the EDRR Protocol.

Baseline Data and Reference Sites

A Midpen-approved biologist/botanist shall select a reference site for each sensitive natural community affected by the Program. The reference site shall be on Midpen lands that are not directly or indirectly affected by Program activities. Prior to Program impacts in an area, an initial assessment shall be conducted to select a reference site that possess characteristics similar to the impact sites. If a suitable reference site does not exist and when feasible, Midpen shall collect 3 years of vegetation sampling data at the proposed impact site. Quadrat sampling shall occur for up to 5 years at a reference site, if located. This pre-impact or reference site data shall serve as the baseline for comparison with post-impact data.

Sampling shall be conducted within quadrats at both the impacted site and reference sites. Quadrat sizes vary depending upon habitat type and shall be determined by the qualified botanist or biological monitor working under a qualified biologist, but typical sizes are 0.5 to 1 square meter for short grassland, 2 square meters for shrublands, and up to 20 square meters for

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

woodlands. The qualified botanist or biological monitor working under a qualified biologist shall conduct power analysis to estimate the minimum number of quadrats needed to determine a statistically significant difference between the impact site and reference sites (at a significance level of 0.05 and a power level of 0.80). Quadrat sampling locations shall be randomly selected through use of a random number generator in GIS. Within each quadrat, absolute cover of plants shall be visually estimated and recorded for the quadrat as a whole and for each individual plant species using the California Native Plant Society's (CNPS's) method for estimating cover values (CNPS 2020). The CNPS method for estimating cover values uses a "bird's eye view," looking from above and estimating cover for the living plants only. Litter and duff shall not be included in these estimates, and the porosity of the vegetation shall be taken into consideration when estimating percent cover. Percent cover diagrams shall be used to facilitate cover estimates. All invasive species that are incidentally detected during sampling (but outside of the quadrats) shall be documented.

Cover data shall be entered into a spreadsheet for analysis. Total cover, percent cover contributed by natives, total cover contributed by non-natives, and cover contributed by invasive weed species shall be calculated from these data.

Success Criteria

- Eradication of invasive or potentially invasive species with a California Invasive Plant Council high rating or designated as noxious that were not detected during the baseline surveys. The target species is considered eradicated after 5 consecutive years with no observations of the target species.
- Within 5 years of the impact, cover of non-native species is less than or equal to cover of non-native species at the reference sites.

MM Biology-6: San Francisco Garter Snake Protection Measures

- All practicable measures shall be taken to avoid killing or injuring San Francisco garter snake during Program activities. Any project-related, human-caused injuries to San Francisco garter snake shall be immediately reported to CDFW and USFWS.
- Within riparian habitat or Waters of the State and/or U.S. and one (1) mile of a known San Francisco garter snake occurrence, Program activities shall be conducted consistent with permit terms and conditions of the current versions of the USFWS Recovery Permit Number: TE225974-2 and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander".
- In suitable habitat where San Francisco garter snake has not been documented:
    a. **Biological Awareness Training.** A biological awareness training shall be provided in accordance with MM Biology-1. A biological monitor shall remain on-site in sensitive areas identified during the pre-survey. If at any time a San Francisco garter snake is observed, work shall stop immediately until a qualified biological monitor is contacted. Biological monitor(s) and/or qualified biologist(s) shall remain on the work area while initial ground disturbing activities are being conducted, after which biological monitor(s) and/or qualified biologists shall be on-call while Program activities are being conducted at these sites.
    b. **Vegetation Removal by Mechanized Equipment**. Mowing in areas of San Francisco garter snake habitat shall be conducted outside the peak San Francisco garter snake activity season as determined by a qualified biologist or biological monitor working under a qualified biologist (work typically occurs late October through mid-March or mid-June to end of August). The qualified biologist or biological monitor working under a qualified biologist shall precede the mowing equipment and inspect vegetation for San Francisco garter snake individuals. The mower head shall be kept at 6 inches above ground. Prior to use of a masticator or other heavy equipment in discrete areas with San Francisco garter snake habitat, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for San Francisco garter snake shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a San Francisco garter snake is observed, all activities shall cease and Midpen shall coordinate with USFWS and CDFW

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

immediately. Prior to the start of work, areas shall be identified by the biological monitor and approved by USFWS and CDFW as acceptable locations to which San Francisco garter snake may be relocated if these species are encountered within a work area. Relocation areas shall be a minimum of 100 feet from the boundary of any work area and shall not include staging areas or roads. No San Francisco garter snake shall be removed from the site or maintained in captivity overnight without prior notification and written approval by the USFWS and CDFW unless the animal is in need of emergency medical assistance. Medical assistance shall be provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. When transporting individual San Francisco garter snake, precautions shall be taken to ensure that the animals are not over-stressed and are maintained in safety. Such measures include: keeping animals in a cool, dark, and safe location (snake bag for San Francisco garter snake), providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, keeping animals isolated to prevent them from harming one another, and ensuring holding tanks or bags are kept clean to prevent the spread of any diseases.

c. **No Stockpiling of Vegetation.** Viable vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.

d. For all work occurring within 50 feet of ponds, streams, and wetlands suitable for San Francisco garter snake, visual surveys shall be conducted by walking at least a 50-foot buffer area around the pond in an attempt to locate individual San Francisco garter snake no more than 24 hours prior to conducting work. A trained and permitted professional biologist shall capture, transfer, and release in a safe area any San Francisco garter snake deemed to be in danger of being harmed by Program activities. If an San Francisco garter snake is located during the pre-treatment surveys but escapes capture, the area where the snake was lost shall be marked by flag and a 50-foot (15 meter) radius shall be actively patrolled during the work. If necessary, individual San Francisco garter snake may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the work has been completed. After the pre-treatment survey, an avoidance strategy shall be devised and presented to all individuals involved in Program activities prior to the start of work. The number of San Francisco garter snake encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS, and each individual snake shall be photographed for use in identification.

MM Biology-7: California Red-Legged Frog Protection Measures

Handling of California Red-legged Frog

Handling of California red-legged frog will be done by permitted and qualified biologists or biological monitor working under a qualified biologist in an expedient manner with minimal harm to the individuals being handled. Handling of California red-legged frog will be done with wet hands. The hands and arms of all workers handling California red-legged frog will be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm California red-legged frog. Larval California red-legged frog will not be handled out of the water for longer than 30 seconds unless rewetted and will not be retained for longer than 5 minutes for processing. If captured California red-legged frog exhibit signs of distress (e.g., lack of response to stimuli or erratic behavior), they will be immediately released at the point of capture. All captured California red-legged frog will be released at the point of capture unless that location puts them in imminent danger, in which case they will be placed in a nearby refugium sufficient to protect them. The number of California red-legged frog to be captured is no more than 30 adults per habitat location (defined as the area that specific work is conducted such as a pond site or OSP) per year. In the course of monitoring associated with the activities, if California red-legged frog egg masses are observed in ponds or wetted areas that are going to dry naturally before tadpoles develop (as determined by a qualified biologist or biological monitor working under a qualified biologist), emergency salvage of egg masses by the qualified biologist or biological monitor working under a qualified biologist is permitted to relocate egg masses into deeper waters that will not be

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

affected by the proposed activities. USFWS shall be notified of the emergency salvage per the terms of the recovery permit. Amplexing pairs of California red-legged frog will not be captured, handled, or disturbed. The permittee will disinfect sampling and field gear to minimize the spread of pathogens as follows:

1. Sampling and field gear will be disinfected after exiting one aquatic habitat and before entering the next aquatic habitat, unless the waters are hydrologically connected to one another.
2. All organic matter will be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water or potentially contaminated sediments. These items will then be rinsed with clean water before leaving each study site.
3. Boots, nets, traps, hands, etc., will be scrubbed with a bleach solution (0.5 to 1.0 cup per 1.0 gallon of water), Quat-128™ (1:60), or a 3 to 6 percent sodium hypochlorite solution and thoroughly rinsed clean with water between study sites. Equipment will be rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of aquatic habitats will be avoided (e.g., clean in an area at least 100 feet from aquatic features). Care will be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.
4. Used cleaning materials (liquids, etc.) will be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves will be retained for safe disposal in sealed bags.

California red-legged frog will not be removed from the wild and held in captivity for any reason unless prior written approval is acquired by the appropriate USFWS Office or unless the severity of an injury to the California red-legged frog obviates immediate care. Animals will be transported according to accepted methods, in moist cloth bags or in terrarium with moisture gel or non-cellulose sponge to minimize desiccation.

Protocols for California Red-legged Frog Depending Upon Location of Activity

For activities conducted within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known California red-legged frog occurrence:

- Prior to and within 48 hours of the planned start of Program activities, a focused survey for California red-legged frog using an agency approved protocol will be conducted by a qualified biologist or biological monitor working under a qualified biologist to determine if they are in the area. If California red-legged frog are found, Midpen will coordinate with CDFW and USFWS immediately to determine the correct course of action and Program activities at that location will not commence until after May 30 or authorized by CDFW and USFWS.
- If California red-legged frog are found, biological monitor(s) and/or qualified biologists will be on site while Program activities are being conducted. Midpen will implement the following measures:
    a. **Inspection of Parked Vehicles:** Any vehicle parked on-site for more than 15 minutes will be inspected by the biological monitor or qualified biologist before it is moved to ensure that California red-legged frog has not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist.
    b. **Vegetation Removal by Mechanized Equipment at California Red-legged Frog Sensitive Sites (areas within or adjacent to wetted aquatic sites):** For vegetation removal on berms or other wetted sites with known California red-legged frog observations, vegetation will be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for California red-legged frog will be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a California red-legged frog is observed that is in harm's way, all activities shall cease and Midpen will notify CDFW and USFWS immediately or the California red-legged frog can be relocated by a person permitted by the USFWS and approved by CDFW for this project to handle California red-legged frog.
    c. **Vegetation Disposal:** Vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

d. **No Stockpiled Soil:** Soil shall not be stockpiled on the ground unless it is on a paved surface or staging area where there are not burrows. Soils stockpiled for more than a single day near potential habitat should be covered or surrounded by exclusion fencing as directed by a qualified biologist to prevent burrowing animals from entering the stockpile.

e. **California Red-legged Frog Exclusion for Sediment Removal with Large Equipment:** California red-legged frog will be excluded from the project site prior to Program activities at sites involving the use of large equipment for sediment removal. USFWS and CDFW-approved exclusion fencing will be installed around the sediment removal site, staging areas, and any areas where fill may be dumped. After installation of the fence barrier, a biological monitor or qualified biologist will inspect the project work area, staging and stockpiling areas daily prior to the commencement of activities. If the biological monitor or qualified biologist determines that sensitive species are not within the work area, equipment or materials may be moved into the project site and Program activities may commence under the observation of the biological monitor.

For activities conducted in ponds:

- **Focused Surveys Prior to Work Activities.** Prior to and within 48 hours of the planned start of Program activities, a focused survey for California red-legged frog using agency approved protocol will be conducted by a qualified biologist or biological monitor working under a qualified biologist to determine if California red-legged frog is in the area. The pond will be sampled by a qualified biologist to ensure that all California red-legged frog from that pond are in the post metamorphic stage and will be minimally affected by draining the pond. If a California red-legged frog is located during the pre-treatment surveys but escapes capture, the area where the frog was lost will be marked by flag and a 50-foot (15 meter) radius will be actively patrolled during the work. If California red-legged frog are found, Midpen will coordinate with CDFW and USFWS immediately to determine the correct course of action and Program activities at that location will not commence until after May 30 or authorized by CDFW and USFWS. After the pre-project survey, an avoidance strategy will be devised and presented to all individuals involved in the pond enhancement prior to starting any activities. The number of California red-legged frog encountered and transferred to safe areas or held in captivity by a permitted and qualified biologist during treatment will be reported to the Sacramento USFWS Office and CDFW.
- **Number of On-Site Biologists.** The minimum number of qualified biological monitors required at each pond site will be determined in advance by either the ranch manager or a permitted biological consultant based on pond size, the amount and complexity of work to be performed, and the equipment to be used. This number of monitors will be approved by USFWS prior to the start of any work.
- **Travel Corridors.** Corridors for travel of vehicles and heavy machinery to the pond site will be established at least 24 hours in advance of the proposed work. Corridors that are not established, marked, and improved roads (paved or unpaved) require special consideration for use by any vehicle. During the use of these off-road corridors by vehicles and machinery, a monitor shall proceed directly before the vehicle or machinery to ensure all California red-legged frog and observable wildlife is cleared from the pathway of the oncoming vehicle. Monitors shall signal vehicles to stop if a California red-legged frog is on the pathway, and shall allow the animal to clear the pathway by its own direction. Any handling of the red-legged frog must only be done by a qualified permitted individual. Measures shall be taken to minimize the number of vehicles allowed on the property. All vehicles involved with the site-specific work that are not transported to the work site will be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor will ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads.
- **Seasonal Work Period in Ponds**. If California red-legged frog are found in the pond and water is present in the pond, sediment removal and berm or outfall repair activities shall be performed from August 15 to November 1. Midpen will coordinate with CDFW and USFWS prior to dredging or de-watering activities. Sediment will be removed from ponds by hand to the extent feasible. Sediment removal from ponds will occur as soon as the ponds are dry (if prior to August 15).
- **Vegetation Removal at Ponds**. If California red-legged frog is found, tule and emergent vegetation will be removed by hand when feasible. If mechanized equipment is used, one or more biological monitors or qualified biologists will be onsite

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

monitoring the scoop bucket while scooping and watching each load unload. Midpen will coordinate with CDFW and USFWS during the annual project notification process regarding anticipated mechanized equipment use for vegetation removal at ponds. In areas where egg masses are known, Midpen and contractor personnel will not enter the channel/pond to avoid dislodging egg masses. Trimming activities shall be performed from the banks, if possible.

- **Inspection for Egg Masses**. In work areas containing emergent vegetation (e.g., tules, cattails), vegetation will be inspected for California red-legged frog eggs masses prior to Program activities. If work cannot be postponed, a buffer of vegetation at least 10 feet in diameter shall be left around any egg masses found. Midpen will keep a record of sites where egg masses are found and conduct vegetation removal at these sites prior to November 1 in subsequent years.

If California red-legged frog is not found during the focused survey, or for activities conducted in suitable habitat where California red-legged frog has not been documented:

- The biological monitor shall remain on-site if sensitive areas are identified during the presurvey. A biological awareness training shall be provided to all persons prior to beginning work. If at any time a California red-legged frog is observed, work shall stop immediately until a biological monitor is contacted. Biological monitor(s) and/or qualified biologists shall then remain be on the project site while Program activities are being conducted. If California red-legged frog is observed, the applicable California red-legged frog measures procedures described above will be followed.

General California Red-legged Frog Avoidance Measures

- If California red-legged frog enters the project area, all work shall stop until the animal leaves on its own. If a person is permitted by the USFWS and approved by CDFW for this specific project to handle California red-legged frog, they can handle and relocate California red-legged frog. Midpen will coordinate with CDFW and USFWS to develop site appropriate avoidance measures utilized for relocation. Prior to the start of work, areas will be identified by the biological monitor-in-charge and approved by the USFWS and CDFW as acceptable locations to which California red-legged frog may be relocated if these species are encountered within a work area. Relocation areas will be a minimum of 500 feet from the boundary of any work area and will not include staging areas or roads. No California red-legged frog will be removed from the site or maintained in captivity overnight without prior notification and written approval by the USFWS and CDFW unless the animal is in need of emergency medical assistance. Medical assistance will be provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. When transporting individual California red-legged frog, safe handling precautions will be taken to ensure that the animals are not over-stressed. Safe handling measures include: keeping animals in a cool, dark, and safe location (terrarium for California red-legged frog), providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, keeping animals isolated to prevent them from harming one another, and ensuring holding tanks or bags are kept clean to prevent the spread of any diseases.
- All practicable measures shall be taken to avoid killing or injuring any life stage of California red-legged frog during habitat enhancement activities.
- The biological monitor and/or qualified biologist shall have the authority to halt work activities that may affect California red-legged frog adults, tadpoles or egg masses until they can be moved out of harm's way.
- Any project-related, human caused injuries to California red-legged frog will be immediately reported to CDFW and USFWS.

MM Biology-8: Foothill Yellow-Legged Frog Protection Measures

If foothill yellow-legged frog are found during the general survey conducted per MM Biology-1, biological monitor(s) and/or qualified biologists shall remain in the work area while Program activities are conducted.

For activities conducted within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known foothill yellow-legged frog occurrence (within the last 20 years):

- Information on foothill yellow-legged frog shall be included in the biological awareness training provided in accordance with MM Biology-1.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		• Any vehicle parked on-site for more than 15 minutes shall be inspected by the biological monitor or qualified biologist before it is moved to ensure that foothill yellow-legged frog have not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist. Vehicles shall not be moved if a frog is found, until the frog has moved out of harm's way as determined by the biological monitor or qualified biologist. • For vegetation removal at sites with known foothill yellow-legged frog observations, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for foothill yellow-legged frog shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a foothill yellow-legged frog is observed, all activities shall cease and Midpen shall notify CDFW immediately. Foothill yellow-legged frog can only be relocated by an individual permitted by CDFW for this Program to handle foothill yellow-legged frog. • Vegetation that is to be removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed. **MM Biology-9: Western Pond Turtle Protection Measures** Within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known western pond occurrence: • Information on western pond turtle shall be included in the biological awareness training provided in accordance with MM Biology-1. • A focused survey for western pond turtle and western pond turtle nests shall be conducted prior to and within 48 hours of the planned start of Program activities by a qualified biologist or biological monitor to determine if any individuals are in the area. • In the event western pond turtle are found in the work area, Midpen shall exercise measures to avoid direct injury to western pond turtle as well as avoid areas where they are observed to occur. • If a western pond turtle is observed during the Program activity, it shall be left alone to move out of the area on its own. If it does not move on its own, it can be relocated to a safe location at least 100 feet away from the work area. Relocation areas shall be of suitable habitat, on shallow banks with slow moving water and shall be far enough away so as not to be affected by Program activities. • If a western pond turtle nest was not found during focused surveys but is observed after initiation of Program activities and its habitat is determined to be unavoidable, all activities shall cease and Midpen shall coordinate with CDFW to develop site-appropriate avoidance and minimization measures. **MM Biology-10: California Giant Salamander, Santa Cruz Black Salamander, and Red-Bellied Newt Protection Measures** • In primary suitable habitat where Santa Cruz black salamander, California giant salamander, or red-bellied newt were observed or are known to occur: • Information on these species shall be included in the biological awareness training provided in accordance with MM Biology-1. • A qualified biologist and biological monitor shall be available and on-call for the duration of Program activities. • A biological monitor shall be present on-site when working within 50 feet of wetted areas including stream channels, seeps, and springs. • For Santa Cruz black salamander only, a biological monitor is also required in areas of talus slopes or areas having human stacked rocks and other suitable materials acting as talus. • Work in wetted areas, talus slopes, or human stacked rocks or other suitable materials acting as artificial talus should be completed prior to July to avoid displacement of Santa Cruz black salamander females laying eggs and attending to clutches.	

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

- Dismantling of talus and human-stacked rocks and other suitable materials acting as artificial talus shall be avoided and minimized whenever possible. If removal is required to meet project objectives, these materials shall be dismantled by hand whenever possible.
- Whenever possible, individual Santa Cruz black salamander, California giant salamander, and red-bellied newt shall be allowed to leave the area on their own.
- Individual Santa Cruz black salamander, California giant salamander, or red-bellied newt (not with eggs) that are in harm's way or do not leave the work site on their own may be relocated by a qualified biologist or biological monitor to predetermined sites located outside of the work area but within the same subwatershed.
- If heavy equipment is required to remove talus, human stacked rocks or other suitable materials acting as artificial talus, this shall be done in the presence of a qualified biological monitor.
- If at any time, Santa Cruz black salamander, California giant salamander, or red-bellied newt eggs are found, the area shall be flagged for avoidance. If the area cannot be avoided to meet Program objectives, Midpen shall coordinate with CDFW to determine the best course of action.
- In all other areas of suitable habitat for Santa Cruz black salamander, California giant salamander, and red-bellied newt:
- Information on these species shall be included in the biological awareness training provided in accordance with MM Biology-1.
- A qualified biologist and biological monitor shall be on-call with suitable availability to respond to calls for the duration of Program activities.
- A pre-survey of the work area is required prior to starting work. If no Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed, work may proceed.
- If an individual Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed at any time, all activities shall stop and the biologist and/or biological monitor shall be notified and the above measures shall be implemented.

MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet)

- Implement IPMP BMP 22 with the additional provisions listed here.
- To avoid potential impacts to nesting birds, all Program activities shall be conducted between September 1 to February 14 unless a preconstruction nesting bird survey has been conducted by a qualified biologist or biological monitor. Work should be done during the non-breeding season whenever possible. The bird nesting seasons for smaller birds and raptors are defined per IPMP BMP 22 as follows:
  - March 15 to August 30 for smaller bird species such as passerines; and
  - February 15 to August 30 for raptors.
  - Earlier surveys may be needed for specific species such as owls, hummingbirds, herons and egrets and/or other species if nesting activity shifts due to climate change, as determined by a qualified biologist or biological monitor working under a qualified biologist.
- If Program activities are scheduled during the nesting season of raptors and/or migratory birds, a focused survey for active nests of such birds shall be conducted by the qualified biologist or biological monitor within 15 days prior to the beginning of project-related activities. Surveys shall be conducted in all suitable habitat located at work areas and in staging and storage areas. The minimum survey radius for each bird type surrounding the work area shall be the following:
  - 250 feet for passerines;
  - 500 feet for other small raptors such as accipiters;
  - 1,000 feet for larger raptors such as buteos and eagles.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

- The bird survey methodology and the results of the survey shall be submitted to the CDFW prior to commencement of Program activities.

- If an active nest (i.e., a nest having eggs or chicks present, or a nest that adult birds have staked a territory and are displaying, constructing a nest, or are repairing an old nest) is found and work cannot be postponed, Midpen shall designate active nest sites as "Ecologically Sensitive Areas" and protected (while occupied) during Program activities with the establishment of flagging or a fence barrier surrounding the nest site. No trees or shrubs that contain active bird nests shall be disturbed until all eggs have hatched, and young have fully fledged (are no longer being fed by the adults, and have completely left the nest site). No habitat removal or modification shall occur within the Ecologically Sensitive Area fenced nest zone even if the nest continues to be active beyond the typical nesting season for the species, until the young have fully fledged and shall no longer be adversely affected by the Program. The minimum distances of the protective buffers surrounding each identified nest site shall be the following per IPMP BMP 22, with some considerations depending on nest location and substrate:
  - 500 feet for large raptors such as buteos;
  - 250 feet for small raptors such as accipiters;
  - 250 feet for passerines; and
  - 1,000 feet for eagles.
- A biological monitor or qualified biologist shall monitor the behavior of the birds (adults and young, when present) at the nest site to ensure that they are not disturbed by Program-related activities. Nest monitoring shall continue during Program-related construction work until the young have fully fledged, are no longer being fed by the parents and have left the nest site and surrounding area, as determined by a biological monitor. If a protective buffer must be modified, Midpen shall coordinate with the CDFW and/or the USFWS as appropriate prior to resumption of Program activities.
- If a lapse in Program-related work of 15 days or longer occurs, another focused survey shall be conducted before Program activities are reinitiated.

MM Biology-12: Marbled Murrelet Nest Protection Measures

a. Implement IPMP BMP 22 with the additional provisions listed here.

b. In areas within the range of marbled murrelet habitat as identified in the Midpen 2007 maps, Midpen shall conduct a survey of habitats within 0.25-mile of the work area for trees that meet the Pacific Seabird Group definition of potential marbled murrelet nesting trees. If such trees are present within 300 feet of the work area or if a marbled murrelet nest is detected, Midpen shall coordinate with CDFW and USFWS before proceeding. If habitat trees are present within 0.25-mile of the work area but are greater than 300 feet from the work area, Midpen shall implement the following conditions:

c. Work within the work area shall be confined to the period of September 15 to November 1 when possible.

d. If activities cannot be conducted outside the breeding season, and must occur during the marbled murrelet breeding season (March 24 to September 15) Midpen shall:

   i. Coordinate with CDFW and USFWS.

   ii. Implement seasonal disturbance minimization buffers as listed in the table below and in the July 26, 2006 document, Estimation of the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California (table below).

Existing Pre-Program (Ambient) Sound Level[a]	Anticipated Action Generated Sound Level[b]			
	Moderate (71-80 dB)	High (81-90 dB)	Very High (91-100 dB)	Extreme (101-110 dB)

Impact Description	Level of Significance Before Mitigation	Mitigation Measure				Level of Significance After Mitigation
		Natural Ambient (<=50 dB)[c]	165 feet	500 feet	1,320 feet	1,320 feet
		Very Low (51-60 dB)	40 feet	330 feet	825 feet	1,320 feet
		Low (61-70 dB)	40 feet	165 feet	825 feet	1,320 feet
		Moderate (71-80 dB)	40 feet	165 feet	330 feet	1,320 feet
		High (81-90 dB)	40 feet	165 feet	165 feet	500 feet

Notes:

[a] Existing (ambient) sound level includes all natural and human-induced sounds occurring at the work area prior to the proposed action, and are not causally related to the proposed action.

[b] Action-generated sound levels are given in decibels (dB) experienced by a receiver, when measured at 15.2 m from the sound source.

[c] "Natural Ambient" refers to sound levels generally experienced in habitats not substantially influenced by human activities.

iii. Conduct a sound level monitoring study to determine the level of ambient and construction activity noise anticipated during construction activities to calculate seasonal disturbance minimization buffer widths. Midpen shall provide a description of methods and results of the study to USFWS and CDFW to coordinate site-specific avoidance measures 30 days prior to commencement of Program activities at the applicable location(s). In order to alert work crews to their presence, marbled murrelet seasonal disturbance buffers, as determined by the sound study and table above, shall be flagged in the field where they enter the work area. If Midpen chooses not to conduct the sound study, no Program activities shall occur within 0.25-mile of potential nest trees during the marbled murrelet breeding season (March 24 to September 15).

iv. If noise generating construction activity takes place during the breeding season (March 24 to September 15) within suitable Redwood and Redwood/Douglas-fir forests, construction activities shall be restricted to 2 hours after sunrise to 2 hours before sunset to minimize disturbance of potential nesting marbled murrelet using forest habitat as a travel corridor between inland nesting and coastal habitat.

v. Midpen or its contractor shall not conduct Program activities within a visual line-of-sight distance of 40 meters or less from a suitable nest tree as designated by a qualified biologist or biological monitor.

e. If marbled murrelet protocol level surveys are conducted and do not indicate that the habitat is occupied by marbled murrelet, the seasonal and distance work restrictions may be lifted with approval from CDFW and USFWS. Protocol level survey procedures and information can be found at: http://www.pacificseabirdgroup.org/publications/PSG_TechPub2_MAMU_ISP.pdf. If Midpen chooses to conduct marbled murrelet protocol level surveys, Midpen shall coordinate with CDFW and USFWS regarding the survey stations to ensure all contiguous suitable habitat is covered and good visuals of the sky and nearby flyways, if present, are provided. If marbled murrelet protocol level surveys are conducted, Midpen shall submit the report consistent with *Methods for Surveying Marbled Murrelets in Forests: A Revised Protocol for Land Management and Research*.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

MM Biology-13: Special-Status Insect Host Plant Protection

- Prior to conducting treatments in suitable habitat for special-status butterfly and moth species, surveys shall be conducted for the following host plant species during the appropriate blooming period:
  - Bay checkerspot butterfly: dwarf plantain (*Plantago erecta*), purple owl's clover (*Castilleja densiflora*), and exserted paintbrush (*Castilleja exserta*).
  - Smith's blue butterfly: coast buckwheat (*Eriogonum latifolium*) and seacliff buckwheat (*Eriogonum parvifolium*)
  - Monarch butterfly: all milkweeds (*Asclepias* sp.)
  - Unsilvered fritillary butterfly: violets (*Viola* sp.)
  - Opler's longhorn moth: California cream cups (*Platystemon californicus*)
  - Callippe silverspot butterfly (not known to be present but the host plant has potential to be present): Johnny Jump up (*Viola pedunculata*)
- Host plants containing eggs, larvae, or pupae of special-status butterfly or moth species shall be avoided, and shall be protected with an appropriately-sized buffer as determined by a qualified biologist, taking into account the characteristics of the plant species and the nature of the proposed treatment.
- Vegetation treatment may proceed if a qualified biologist determines that the host plants (1) are not occupied by special-status butterflies or moths, and (2) may benefit from treatment (such as if the host plants have already set seed and post-treatment conditions will favor them over non-native weed species).

MM Biology-14: Salmonid Protection Measures

- Vegetative debris shall not be stockpiled in areas where it could enter a stream, wetland or riparian area.
- Corrective actions, such as repairs to erosion control BMPs necessary to preserve water quality and revegetation activities, are allowable year-round.
- **Seasonal Work Period in Salmonid Critical Habitat:** Program activities within streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon shall be limited to June 15 to October 31.
- **Seasonal Work Period in Aquatic Habitats Outside of Critical Habitat.** Program activities within streams and associated riparian corridors that are not designated Critical Habitat for salmonids shall be limited to April 15 to October 31, or are permissible from November 1 to April 14 under the following conditions:
  a. Work shall not occur until the site has received no rainfall for a period of 10 days and there is no rain in the forecast for a period of 7 or more days, and work requires no greater than 5 days to complete.
  b. Work started during this period must be at least 50 percent complete within 2.5 days of beginning work.
  c. Winterization materials must be on hand and installed if unanticipated rainfall begins (defined as 0.5 inches of rain in a 24-hour period).

MM Biology-15: Monarch Butterfly Overwintering Aggregation Protection

Prior to any Program activities in tree groves comprised primarily or entirely of pine, cypress, fir, or eucalyptus that are within 2 miles of the Pacific Coast, a qualified biologist or biological monitor working under a qualified biologist shall survey the grove for aggregations of monarch butterflies during the overwintering season according to the Xerces Society's Western Monarch Count Protocol (Xerces Society 2019), available at https://www.westernmonarchcount.org:

Two surveys shall be conducted during the overwintering season, one during the Western Monarch Thanksgiving Count period (the three-week period centered on the Thanksgiving holiday), and a second during the New Year's Count period (the two-week period beginning the weekend prior to New Year's Day).

- Each survey shall be conducted by two surveyors to provide multiple independent estimates of monarch numbers.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

- Surveys shall be conducted in the morning while temperatures are below 55˚ F (13˚ C) and monarchs are more likely to be clustered.
- Surveys shall not be conducted during rain or strong winds due to poor visibility and the chance that individual monarchs shall be scattered on the ground.
- If no monarch overwintering aggregations are observed, Program activities may proceed pursuant as long as they occur prior to November 1. If Program activities are delayed beyond November 1, then the grove shall be re-surveyed.
- If a monarch overwintering aggregation of any size is detected, then no Program activities may take place inside the tree canopy within 200 feet of the aggregation, when present. Activities outside of the canopy line but within 200 feet may proceed (i.e., treatment of low-growing vegetation outside of the tree grove) if a qualified biologist or monitor determines that the activity does not pose a threat to the monarch aggregation.
- Once the aggregation disperses (typically by March), treatment of vegetation within 200 feet of tree(s) where monarch aggregations were observed may proceed if, as determined by a qualified biologist or monitor, it shall not result in significant alteration to wind and sunlight patterns within the grove.
- If monarch overwintering aggregations are detected in eucalyptus removal areas, then a long-term tree planting strategy is necessary (see *Protecting California's Butterfly Groves* [Xerces Society 2017]).
- Native tree species suitable for monarchs must be planted many years prior to eucalyptus removal with the understanding that they may not reach functional heights to provide wind protection and suitable dappled lighting for 15-30 years. Transplanting saplings from a local source may speed this process. Planting of eucalyptus shall be prohibited. Removal of eucalyptus may proceed once native replacement trees have reached sufficient size to provide wind protection within the grove.
- Standing dead trees generally do not contribute to monarch overwintering habitat (Xerces Society 2017) and may be removed within the grove between April 1 and August 31, outside of the overwintering period, as determined appropriate by a qualified biologist or monitor. Sites where invasive dead trees have been removed may create opportunities for native tree planting within the interior of the grove.
- If a eucalyptus grove where a monarch overwintering aggregation was previously detected is re-surveyed using the Western Monarch Count Protocol (Xerces Society 2019) and found to be unoccupied for 5 consecutive years, then the grove may be removed before native replacement trees have reached full size.

MM Biology-16: Prescribed Burns and Biological Resource Avoidance

- All participants in the burn shall be briefed by a Resource Advisor on the special-status species potentially present, where they would likely be found, and who to contact if one is sighted. Resource Advisors shall (1) work with the ignition teams, (2) be a part of any ignition sequence planning, and (3) be in radio contact with either the Ignition Specialist or the Incident Commander directly to ensure quick communication and decision-making regarding the safety of sensitive wildlife.
- Prescribed burns shall maintain the following buffers from various sensitive species and wildlife habitats:
  - Active bird nests shall be given species-appropriate buffers matching those outlined in MM Biology-11 and IPMP BMP 22:
    i. 250 feet for passerines
    ii. 500 feet for other small raptors such as accipiters
    iii. 1,000 feet for larger raptors such as buteos and eagles
  - A 10-foot buffer from San Francisco dusky-footed woodrat nests
  - A 20-foot buffer from occupied bat roosting trees
  - A 10-foot buffer from patches of special-status butterfly and moth host plants if prescribed burns occur before the plants have set seed. Patches of host plants that may benefit from fire may be burned if determined appropriate by a qualified biologist or biological monitor working under a qualified biologist.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		• The listed buffer areas may be managed using other vegetation management techniques following each burn (e.g., cattle grazing), but are to remain completely undisturbed during prescribed fire events. Every reasonable attempt shall be made to maintain 0.25 to 0.5 acre (0.1 to 0.2 hectare) of unburned habitat for every 10 acres (4 hectares) of burned habitat (e.g., 4 to 8 acres of retreat habitat are needed for a 160-acre burn, and 9 to 18 acres are needed for a 350-acre burn). Retreat areas shall be conserved randomly throughout the treatment area, especially in areas with known populations of San Francisco garter snake and California red-legged frog. These retreat areas may be naturally occurring areas such as rock formations, ponds and other wetland/riparian areas, areas with a high density of burrows, and other areas not prone to burn, or these areas may be created and maintained using hand tools or water to create fire-breaks or wet-lines. • No more than 24 hours prior to conducting prescribed fires, visual surveys shall be conducted by walking transects throughout the proposed burn area in an attempt to locate individual special-status reptile and amphibian species, including San Francisco garter snake, California red-legged frog, foothill yellow-legged frog, California tiger salamander, western pond turtle, Blainville's horned lizard, California giant salamander, Santa Cruz black salamander, and red-bellied newt. With permission from CDFW and/or USFWS, a permitted biologist or biological monitor shall capture, transfer, and release in a safe area any special-status reptiles or amphibians deemed to be in danger of being harmed by the prescribed fire activities. If individuals are located during the pre-treatment surveys but escape capture, an area approximately 50 feet (15 meters) in diameter around the individual shall be protected from the burn. If necessary, individuals may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the burn has been completed. The numbers of special-status reptiles and amphibians encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS and CDFW. If San Francisco garter snakes are captured, each individual shall be photographed for use in identification. • All vehicles involved with the site-specific burn shall be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor shall ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads, and if it is necessary for a vehicle to travel off the designated main road, a monitor shall precede the vehicle to clear wildlife from the pathway of the vehicle. Only biological monitors specifically authorized by the USFWS and CDFW to handle San Francisco garter snake or California red-legged frog (normally these shall be individuals holding a federal recovery permit for the species) shall be allowed to handle, transport, and relocate individuals of these species. • Below ground temperature monitoring shall be conducted during the burn to monitor air temperatures in a representative subset of suitable San Francisco garter snake refugia. One or more biologists or biological monitors shall place ground temperature monitoring devices (e.g. "hobo thermocouples" in rodent burrows throughout the burn area to monitor changes in temperature in the burrows as fire moves across the landscape. The knowledge gained shall be useful in determining how to conduct future prescribed fires in San Francisco garter snake habitat in a manner that shall minimize potential effects to the species. • Immediately following each prescribed fire, the permittee shall search the affected post-treatment area to identify dead or injured individuals of all vertebrate taxa. Dead individuals of special-status species shall be collected and deposited at an approved repository. Injured individuals shall be handled only by a permittee authorized to capture and handle the species. Midpen shall ensure medical assistance is provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. • Prescribed fire shall not be employed in tidal marsh habitats. • If an emergency situation necessitates the use of water from a pond occupied by California red-legged frog, a striker pump and intake hose may be used to draw water from one of the small wetland ponds in the burn area to fill engines or back pumps. The intake hose shall be screened with 0.25-inch mesh to prevent intake of California red-legged frogs. The burn plan details the use of lake and ocean water to fill helicopter buckets to aid suppression efforts. If a helicopter bucket is used, it shall draft from the center of the pond, to prevent uptake of California red-legged frogs that may potentially be present.	

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		• Within San Francisco garter snake habitat, post-burn monitoring shall be conducted as part of the Program activity and shall include (1) vegetative response to the burn, (2) wildlife response to the burn, and (3) fire behavior and burn conditions. Because the burn is intended to enhance San Francisco garter snake habitat, the monitoring emphasis for vegetation and wildlife shall be on the wildlife and habitat features that are considered to be necessary to support San Francisco garter snakes. The variables measured for San Francisco garter snake response to habitat are pre- and post-burn data on the (1) vegetation community in the burn area in order to determine vegetative response to the burn and (2) the frequency of valley pocket gopher (*Thomomys bottae*) burrows and other burrows. As part of its standard post-fire evaluation, CAL FIRE and/or Midpen shall provide an analysis of the burn, including how the fire responded to weather and other burn conditions, and percent coverage of the burn within the boundaries of the burn unit. • Beginning immediately after the burn, the frequency (number) of rodent burrows shall be measured during the vegetation transect monitoring. Vegetation monitoring shall include the establishment of four transects within and three transects outside of the burn area for comparative analysis. Transects shall be randomly established in burned and unburned areas and each transect shall measure 50 meters in length. A meter-square plot shall be established at 5-meter intervals along the transects. Vegetative composition and percent cover for all plant species shall be recorded for each plot. Transect sampling shall take place prior to the burn and at least once per year after the burn for 3 years. Response of native and non-native grasses and coyote brush to the burn shall be of particular interest. Data collected before, during, and after the burn, and the observations made during the evaluation of the burn shall be compiled into a report within 1 year following the burn. Upon completion, the report shall be submitted to USFWS.	
Impact Biological Resources-2: Substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS, or State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. Actions implemented under the Program could directly and indirectly impact sensitive communities, including sensitive grassland communities, native chaparral and coastal scrub communities, forest communities, oak savanna communities, and riparian communities. Use of equipment and vehicles, and installation of fuelbreaks near wetland and other aquatic communities could adversely impact the wetland plant community. Prescribed herbivory has the potential to adversely impact native grassland if grazing is not properly managed. Implementation of any of the plans within the Program has the potential to introduce non-native and invasive species that could adversely impact sensitive communities. MM Biology-1 identifies training, monitoring, and reporting requirements. MM Biology-4 and MM Biology-5 require Midpen to implement techniques to minimize the spread of invasive species and forest diseases, including expansion of IPMP's EDRR program to VMAs. MM Biology-17 requires provisions for a qualified biologist to review and assess each project for impacts to sensitive natural communities and to identify spatial buffers or other management actions to reduce potentially significant impacts on the sensitive community. MM Biology-18 requires compensatory mitigation for any impacts to sensitive natural communities that cannot be avoided. MM Biology-19 includes measures to ensure that any impacts to jurisdictional waters are properly evaluated and permitted. Implementation of these measures would reduce impacts on sensitive communities to less than significant.	Potentially significant	**MM Geology-1: Prescribed Herbivory Land and Trail Control (see Section 4.6: Geology and Soils below)** **MM Biology-1: Training, Monitoring, and Reporting (see above)** **MM Biology-4: Invasive Plants and Soil Pathogens (see above)** **MM Biology-5: Invasive Plant Detection and Response (see above)** **MM Biology-17: Sensitive Natural Communities** • Before a Program activity is implemented, a Midpen approved botanist shall: (1) assess the site- and Program-specific threats to each sensitive natural community that might be impacted by the Program activity; and (2) recommend spatial buffers or other management actions that shall reduce potentially significant impacts on the sensitive natural community to less than significant levels. The botanist's recommendations shall be site-specific, and shall consider the specific Program activity being proposed, the resiliency of the community, and its susceptibility to potentially significant impacts associated with the Program activity. Midpen shall implement the botanist's recommendations, to the extent feasible. If Midpen is unable to implement the botanist's recommendations, or if there is uncertainty regarding the effects of a Program activity on the community, Midpen shall monitor the treatment areas after treatment at an interval determined appropriate by the qualified biologist or biological monitor working under a qualified biologist. If the monitoring indicates the Program activity has negatively impacted the community by resulting in substantial loss or degradation of the community, the terms of MM Biology-18 shall apply. • To the extent feasible, VMAs, fire management logistics areas, and firefighting infrastructure improvements shall be configured to minimize habitat fragmentation, especially in areas with unique structural components or habitat elements and frequency of treatment shall be carefully defined to reduce or minimize the likelihood of type conversion. If conversion is occurring, conditions of MM Biology-18 for compensatory mitigation shall be applied. • All vegetation removal within tidal marsh or in uplands within 50 feet of tidal marsh shall be conducted with hand tools only. No heavy equipment is permitted. • Vegetative debris (e.g., slash, chips) shall not be placed on top of vegetation in sensitive communities, unless prescribed in the VMP or PFP and determined by a qualified biologist or biological monitor working under a qualified biologist to not have negatively affect the community.	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

- Personnel shall not walk through wetlands or other vegetation communities susceptible to trampling.
- Prior to approving an off-road travel route, Midpen shall survey the route to ensure avoidance of sensitive biological resources, including special-status species and sensitive natural communities (or habitats).
- If it is not feasible to locate staging areas in previously disturbed areas, they shall be located outside of sensitive communities (or habitats) that could suffer long-term impacts due to staging activities. Staging areas shall not be located in riparian or wetland communities, nor in any of the Group 1 sensitive communities identified for avoidance.
- Burn piles shall be placed in areas away from any live vegetation that might be damaged by the burn.
- Grazing shall be carefully managed, should it occur in or near a sensitive natural community, to limit the grazing duration and to ensure that erosion and sedimentation of waterways and riparian areas does not occur (in accordance with MM Geology-1).

MM Biology-18: Compensatory Mitigation for Impacts to Sensitive Natural Communities

Midpen shall provide compensatory mitigation for Program impacts to Group 1 and Group 2 communities. The baseline ratio for impacts to Group 1 communities shall be 3:1 (e.g., 3 acres compensation for each acre impacted). The baseline ratio for impacts to Group 2 communities shall be 2:1. Several factors may dictate the need for a higher ratio (Clement et al. 2014, USACE 2015, USFWS 2016, State Water Resources Control Board 2019). They are:

1. **Mitigation Strategy:** The baseline ratio applies to mitigation projects that entail creation or restoration of the impacted community. One half point shall be added to any mitigation project that involves only enhancement of an existing community as recommended by a Midpen-approved biologist (e.g., seed within native species, removal of human-made infrastructure such as fences or hardscape, treatment of invasive species).
2. **Temporal Loss:** The baseline ratio assumes there shall be no temporal loss of the community. Therefore, the baseline ratio only applies to mitigation projects that are completed within a year after impacts occur. If the mitigation project is not initiated within a year after impacts occur, the ratio shall be increased by 0.2 for each year of lag time between the time of impacts, and the start of mitigation. For example, if mitigation for a Group 2 community is not expected to be initiated until two years after the impacts occur, the mitigation ratio shall be 2.2:1.
3. **Uncertainty:** There is inherent uncertainty in whether a mitigation project will fully replace the functions that are lost from the impact site. As a result, the mitigation ratio must be commensurate with the risk that a mitigation project will not achieve the designated goal, which is generally to replace the functions that are lost from the impact site. The baseline ratios account for the uncertainty inherent in all mitigation projects because they shall achieve "no net loss" of sensitive community functions even if some (relatively small) portions of the mitigation site fail to achieve the desired conditions. However, the baseline ratios assume a relatively high probability of success. Due to Midpen's expertise and experience with mitigation projects, Midpen assumes the mitigation project shall succeed if: (a) Midpen has successfully completed comparable mitigation projects, or (b) scientific literature supports the inference that the mitigation project is likely to be successful (e.g., due to its simplicity). If the proposed mitigation project does not satisfy either criterion, one point shall be added to the baseline ratio (e.g., the ratio for a Group 2 community shall be increased to 3:1).
4. **Distance:** Compensatory mitigation ratios are generally dependent on the distance of the mitigation site from the impact site. To the extent feasible, Midpen shall mitigate on Midpen property, and within the same watershed as the impact site.
5. **Kind:** The baseline ratios assume "in-kind" mitigation (i.e., the mitigation site replaces the same sensitive natural community or wetland type as the one impacted by the Program). In some instances, there may be ecological benefits to "out-of-kind" mitigation. There shall be no increase in the mitigation ratio for mitigation projects that restore, create, or enhance a Group 1 community as compensation for impacts to a Group 2 community. Midpen shall document the scientific justification for all proposed out-of-kind mitigation projects. No out-of-kind mitigation

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

shall be allowed for impacts on wetland or riparian communities unless authorized by the regulatory agency(ies) with jurisdiction over the impacted resource.

6. **Other Impacts:** A mitigation ratio greater than 1:1 may be needed to account for a project's indirect impacts, and for its contribution to cumulative impacts.[1] The baseline ratios account for these impacts.

To determine the appropriate mitigation ratio for a given project (e.g., treatment), Midpen shall apply the factors described above, in the order listed.

Midpen shall maintain a ledger that documents:

1. Impacts on sensitive communities, including type of community impacted, acreage impacted, year(s) impacts occurred, and activity that caused the impact.
2. The mitigation ratio applied to each Program activity, and the rationale for that ratio. The rationale shall include a formula that incorporates the variables outlined above.
3. Any additional mitigation requirements imposed by the regulatory agencies (e.g., in a Streambed Alteration Agreement from CDFW) beyond what is already described above.
4. Mitigation projects, including the mitigation strategy, type, location, acreage, and date completed.

The ledger shall be used to document compliance with the compensatory mitigation requirements. A copy of the ledger shall be made available to the regulatory agencies.

Any plants or seeds needed for a mitigation project shall be derived from sources determined appropriate by the Midpen-approved botanist. Dependent upon the species, plants or seeds shall be sourced from locally-appropriate genetic material and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible.

Performance Standards. Projects designed to mitigate significant impacts to sensitive natural communities shall be considered successful once they achieve the membership rules described in the most current version of the Manual of California Vegetation. A District Approved botanist shall implement the Relevé and Rapid Assessment (RA) vegetation sampling techniques (CDFW and CNPS 2019) to monitor sensitive natural community development at mitigation sites until the site achieves the membership rules (e.g., percent relative cover) described in the most current version of the Manual of California Vegetation, after which the site shall be monitored in accordance with Midpen's monitoring program.

MM Biology-19: Wetlands and Other Potential Jurisdictional Aquatic Resources

Wetlands and other potential jurisdictional waters that may be impacted by the Program shall be formally delineated by a biologist with expertise in wetland science. In addition to conducting the delineation, and in accordance with the recommendations provided by Castelle et al. (1994), the biologist shall assess the following criteria to determine the buffer size needed to protect the jurisdictional resource from indirect impacts: (1) resource functional value, (2) intensity of adjacent land use, (3) buffer characteristics, and (4) specific buffer functions required. The biologist shall document the results of this assessment and the buffer recommendations in a report to Midpen.

Midpen shall not conduct any Program activities that might directly or indirectly impact jurisdictional wetlands and waters unless it possesses permits from the appropriate State and federal regulatory agencies. Midpen shall make every attempt to avoid direct and indirect impacts to wetlands and other jurisdictional waters. If complete avoidance is not possible, a

[1] Under CEQA, mitigation must be roughly proportional to the level of impacts.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		biologist with expertise in wetland science shall document baseline conditions according to the California Rapid Assessment Method (CRAM) prior to any potential impacts. According to the U.S. Army Corps of Engineers (2015): • CRAM is a standardized, cost-effective tool for assessing the health of wetlands and riparian habitats. The overall goal of CRAM is to provide a rapid, scientifically defensible, and repeatable assessment method that can be used routinely for wetland monitoring and assessment. CRAM consists of assessing aquatic resources with respect to four overarching "attributes," i.e., buffer/landscape context, hydrology, physical structure, and biotic structure. A number of "metrics" address more specific aspects of aquatic resource condition within each of these attributes. Each metric is assigned a numeric score based on either narrative or schematic descriptions of condition or thresholds across continuous values. Metric descriptions are based on characteristics of aquatic resources observed across a range of conditions, such that the highest score for each metric represents the theoretical optimum condition obtainable for the aquatic resource feature being evaluated. • The baseline CRAM assessment shall be used in two ways: (1) to monitor the effectiveness of the buffer in preventing indirect impacts to the wetland community; and (2) to ensure compensatory mitigation replaces the wetland functions impacted by the Program. Compensatory mitigation for impacts to wetland and other jurisdictional waters shall be provided in accordance with USACE guidelines, including: (1) *Guidelines for Preparing a Compensatory Mitigation Plan*; (2) *Attachment 12501.6 – SPD Mitigation Ratio Checklist*; (3) *Regional Compensatory Mitigation and Monitoring Guidelines*, and (4) *2501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios* (USACE 2010, 2012, 2015, 2017). If possible, compensatory mitigation for impacts to wetlands and other jurisdictional waters shall restore a comparable aquatic feature within the same watershed as the impact. Midpen shall adopt performance standards consistent with the USACE's *Uniform Performance Standards for Compensatory Mitigation Requirements* (USACE 2012). Mitigation monitoring shall adhere to the *Regional Compensatory Mitigation and Monitoring Guidelines* (USACE 2015).	
Impact Biological Resources-3: Substantial interference with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. Vegetation management activities could be located in areas used as wildlife movement corridors or nurseries; however, the nature of work, which would retain a thin vegetation cover, would not entirely inhibit wildlife movement. Prescribed fires and installation of firefighting infrastructure could modify existing natural habitats and cause destruction, siltation, or spills into native wildlife nursery sites. The Program includes designation of refugia in some treatment areas (i.e., FRAs) to protect resident wildlife, but impacts could still be significant. MM Geology-2 and MM Geology-3 require implementation of design features to minimize erosive effects of livestock trails and a buffer distance between prescribed and pile burns around streams and other erosion control measures to minimize effects from sedimentation on aquatic breeding species. MM Biology-7 requires surveys for California red-legged frog egg masses prior to activity in suitable habitat. MM Biology-9 requires avoidance of western pond turtle nests. MM Biology-11 identifies specific survey radii and monitoring protocol for nests and nesting birds. MM Biology-16 identifies buffer distances needed to avoid harm to birds from burning. With the implementation of these measures, impacts on native wildlife nursery sites would be less than significant.	Potentially significant	**MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils below)** **MM Geology-3: Fire Lines During Prescribed Burns (see Section 4.6: Geology and Soils below)** **MM Biology-7: California Red-Legged Frog Protection Measures (see above)** **MM Biology-9: Western Pond Turtle Protection Measures (see above)** **MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet) (see above)** **MM Biology-16: Prescribed Burns and Biological Resource Avoidance (see above)**	Less than significant
Impact Biological Resources-4: Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or adopted HCP, Natural Community Conservation Plan (NCCP), or other approved local, regional, or State HCP. The proposed Program activities have the potential to adversely impact several species, including those covered by the Santa Clara Valley Habitat Plan. Implementation of MM Biology-1 through MM Biology-17	Potentially significant	**MM Biology-1: Training, Monitoring, and Reporting (see above)** **MM Biology-2: Special-Status Plants (see above)** **MM Biology-3: Compensatory Mitigation for Impacts to Special-Status Plants (see above)** **MM Biology-4: Invasive Plants and Soil Pathogens (see above)**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
would ensure that impacts on special-status wildlife and plants as well as nesting birds are reduced to less than significant. The proposed Program activities could conflict with local tree ordinances if trees were removed in violation of those ordinances. MM Biology-20 would be implemented to require a survey of trees in removal areas to identify if any trees meet the requirements of the local jurisdiction's significant or heritage tree ordinances. With implementation of the mitigation, impacts would be less than significant.		**MM Biology-5: Invasive Plant Detection and Response (see above)** **MM Biology-6: San Francisco Garter Snake Protection Measures (see above)** **MM Biology-7: California Red-Legged Frog Protection Measures (see above)** **MM Biology-8: Foothill Yellow-Legged Frog Protection Measures (see above)** **MM Biology-9: Western Pond Turtle Protection Measures (see above)** **MM Biology-10: California Giant Salamander, Santa Cruz Black Salamander, and Red-Bellied Newt Protection Measures (see above)** **MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet) (see above)** **MM Biology-12: Marbled Murrelet Nest Protection Measures (see above)** **MM Biology-13: Special-Status Insect Host Plant Protection (see above)** **MM Biology-14: Salmonid Protection Measures (see above)** **MM Biology-15: Monarch Butterfly Overwintering Aggregation Protection (see above)** **MM Biology-16: Prescribed Burns and Biological Resource Avoidance (see above)** **MM Biology-17: Sensitive Natural Communities (see above)** **MM Biology-20: Significant and Heritage Tree Ordinances** Prior to conducting any work that involves tree removal, biologist or other personnel qualified in tree identification shall identify if any County or local protected and heritage tree ordinances are relevant to the area of work. If an ordinance would apply to the area of work, the area of work shall be investigated by the biologist or personnel qualified in tree identification to identify if any trees subject to the ordinance are found in the project area. If a tree subject to the ordinance is in the area of work, the tree shall be clearly marked as a "Leave Tree" so that it is not accidentally damaged or removed during work. If a tree that qualifies as a protected or heritage tree must be removed, the appropriate steps shall be implemented to obtain the appropriate permits for tree removal.	
4.5 Cultural and Tribal Cultural Resources			
Impact Cultural Resources-1: Substantial adverse change in the significance of a historical or archaeological resource pursuant to CEQA Guidelines Section 15064.5. Vegetation management activities under the Program would occur on lands that contain known and likely previously undiscovered historic or archaeological resources and tribal cultural resources. Use of mechanical methods and prescribed herbivory would result in ground disturbance of at least the top layer of soil and could unearth and damage cultural resources. Clearing of skid trails to access management areas could expose and damage cultural resources. Prescribed burns would involve use of heavy equipment and vehicles during suppression and mop-up activities, which would damage superficially deposited cultural resources. Heat from prescribed burns could damage resources on or very near the surface. MM Geology-3 requires implementation of design features to minimize erosion effects of livestock trails that could result in erosion that could expose and damage resources. Midpen requires worker training and halting work within 50 feet of a cultural resource discovery until it can be assessed (IPMP BMP 26; Contract Conditions), which is not likely sufficient to reduce potential impacts and would not reduce impacts caused by prescribed burns. Impacts could be potentially significant. MM Cultural-1 requires a desktop review, a pre-activity survey, and avoidance or evaluation of found resources. MM Cultural-2 requires data collection in accordance with a Treatment Plan if any resources cannot be avoided.	Potentially significant	**MM Geology-3: Fire Lines During Prescribed Burns (see Section 4.6: Geology and Soils below)** **MM Cultural-1: Pre-Activity Surveys and Avoidance of Impacts to Cultural Resources** Prior to conducting any work associated with the WFRP that could disturb the ground surface or subsurface, the work areas shall be compared against Midpen's GIS data to determine if the area has been previously surveyed and, if it has been surveyed, if any historic or archaeological resources or tribal cultural resources are found in the work area. Any resources that have not been evaluated shall be assumed eligible for listing in the CRHR and assumed significant. If the GIS data shows that the proposed areas where soil disturbance below the surface via heavy equipment or burning (i.e., for VMP activities involving heavy equipment, prescribed fires under the PFP, and any work that involves grading under the Wildland Fire Pre-Plans) have not been previously surveyed, then a discretionary archival-records search at the California Historical Resources Information System, Northwest Information Center, can be completed. If the area is still not found to have been previously surveyed, a pre-activity cultural-resources survey shall be conducted by a qualified archaeologist or cultural resources specialist in accordance with industry standards prior to performing work unless vegetation is too dense, making a survey impossible. In the event vegetation is too dense, making a pre-activity survey challenging or impossible, the training conducted under IPMP BMP 26 shall be sufficient to permit work to be conducted using only manual techniques accessed on foot.	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Implementation of these measures would reduce impacts on cultural resources to less than significant.		New resources noted during the field survey shall be recorded and mapped on appropriate California Department of Parks and Recreation 523 forms. In the case of a previously recorded resource, an updated California Department of Parks and Recreation 523 form detailing current condition shall be completed, as appropriate. Any historical or archaeological resources (not including built-environment historic features) located in the work area (as identified in either previous surveys, in a discretionary records search, or during pre-activity surveys) plus a 50-foot buffer shall be identified on any activity plans. The boundaries around the resource/buffer shall be temporarily marked, such as with fencing or flagging. If work must commence in the sensitive area, it can only be performed using hand tools or hand- powered tools, cannot include ground disturbance below the topsoil layer, and can only be accessed on foot. Alternatively, the resource can be evaluated for eligibility under the CRHR. If found ineligible and not a tribal cultural resource, work could proceed as normal. If found eligible or to be a tribal cultural resource, impacts on the resource must be avoided (through total avoidance of the area or through use of hand methods only in the area of the resource, as described here). If not avoidable, MM Cultural-2 shall be implemented. After work is completed, all cultural resource delineators (e.g., flags or fencing) shall be removed in order to avoid potential vandalism, unauthorized excavation(s), etc. Midpen shall contact and consult with local Native American groups identified by the Native American Heritage Commission and request input on Tribal Cultural Resources within the project areas if any prehistoric resources are identified during pre-activity surveys and impacts to these resources cannot be avoided or minimized (such as through the use of hand tools). The Midpen Project Manager shall have the discretion to consult, depending on the potential impacts anticipated from the Program activity. Information on the proposed activity, the results of the information review(s) and field inventory, and any Native American input shall be reported in a Memo to the File with the implemented mitigation measures based on anticipated impacts. **MM Cultural-2: Treatment of Unavoidable Resources** For any resources either discovered during implementation of activities (per IPMP BMP 26) or found during pre-activity surveys under MM Cultural-1 and that cannot be avoided, recordation, additional archaeological testing, Native American consultation (if pre-historic), and data recovery shall be implemented. Data recovery for any significant cultural resources that cannot be avoided or preserved in place shall be guided by a Treatment Plan, to be submitted to Midpen for approval and completion. Impacts shall be assessed for the installation of new permanent infrastructure under the Wildland Fire Pre-Plans near a built-environment historic feature, landscape, or district. The new infrastructure shall either be relocated if an effect is likely or data recovery implemented in accordance with a Treatment Plan (as previously discussed). A report of the findings and resource interpretation, disposition of any recovered cultural materials, and recommendations for future resource protection shall be completed and filed with Midpen, interested Native Americans, the California Historical Resources Information System (if pre-historic), and the Northwest Information Center.	
Impact Cultural Resources-2: Disturbance of human remains, including those interred outside of formal cemeteries. Several Program activities, in particular use of heavy equipment for vegetation removal and installation of new firefighting infrastructure, have some potential to directly disturb human remains. Areas near perennial creeks in lowland valleys have a higher potential for encountering human remains than other areas, such as along peaks and ridgelines. MM Cultural-3 requires work to halt within 50 feet of the discovery of human remains, coordination with the County Coroner's office, and appointment of a Most Likely Descendent. The impact on human remains due to disturbance would be reduced to less than significant with implementation of mitigation.	Potentially significant	**MM Cultural-3: Human Remains** If human remains and associated or unassociated funerary objects are exposed during vegetation management, work within 50 feet of the discovery shall be halted and the find protected from further disturbance in accordance with Midpen protocols for resource protection. The County Coroner or Medical Examiner shall be notified immediately and, in the event of the determination that the human remains are Native American remains, notification of the Native American Heritage Commission shall be undertaken to obtain a most likely descendant (MLD) (PRC § 5097.98) for treatment recommendations. Midpen, the archaeological consultant, and the MLD shall make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines Section 15064.5[d]). The agreement shall take into consideration the appropriate removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects.	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		Implementation of the Treatment Plan shall be undertaken by Midpen, and any findings shall be submitted in a report to the MLD and filed with the California Historical Resources Information System, NWIC.	
Impact Cultural Resources-3: Adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k); or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. Implementation of the Program has the potential to significantly impact known and previously undiscovered prehistoric resources eligible for listing in the California Register of Historic Resources (CRHR), which could also be considered tribal cultural resources. Midpen requires worker training and halting work within 50 feet of a cultural resource discovery until it can be assessed (IPMP BMP 26; Contract Conditions), in the absence of mitigation measures, this BMP alone is not likely sufficient to reduce potential impacts and would not reduce impacts caused by prescribed burns. Impacts could be potentially significant. MM Cultural-1 requires a desktop review, a pre-activity survey, and avoidance or evaluation of found resources. MM Cultural-2 requires data collection in accordance with a Treatment Plan if any resources cannot be avoided. Implementations of these measures would reduce impacts on cultural resources to less than significant. MM Cultural-3 would ensure that Native American human remains, if discovered, are properly addressed in accordance with law. The impact would be reduced to less than significant with implementation of these mitigation measures. Midpen sent notification letters regarding the Program to eight Native American tribes on May 23, 2020. No tribes requested formal notification of projects within the Program area per AB 52. Midpen is engaged in informal consultation with the Amah Mutsun Tribal Band. The Tribe's representatives expressed interest in the PFP component of the Program and requested to be informed when preparation of the detailed PFP begins.	Potentially significant	**MM Cultural-1: Pre-Activity Surveys and Avoidance of Impacts to Cultural Resources (see above)** **MM Cultural-2: Treatment of Unavoidable Resources (see above)** **MM Cultural-3: Human Remains (see above)**	Less than significant
		4.6 Geology and Soils	
Impact Geology and Soils-1: Direct or indirect potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; ii) Strong seismic ground shaking; iii) Seismic-related ground failure, including liquefaction; or iv) Landslides. The Program area is located within earthquake fault zones and Midpen lands are also designated as zones of required investigation under the Seismic Hazards Mapping Act. Seismic ground shaking events are unpredictable and the potential occurrence of such events coinciding with Program activities is minimal. The proposed Program involves implementation of various vegetation management activities and does not include any substantial new structures or operational activities that could create or exacerbate a ground shaking risk to the surrounding population. Implementation of Program activities would not cause an increased risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, or seismic related ground failure, including liquefaction. Refer to Impact Geology and Soils-3 below for discussion of landslides impacts.	Less than significant	No mitigation measures are required.	N/A
Impact Geology and Soils-2: Substantial soil erosion or the loss of topsoil. Manual and mechanical methods, prescribed herbivory, and prescribed burning could result in erosion and loss of topsoil. BMP IPMP 28 requires that erosion control measures be implemented before or	Potentially significant	**MM Geology-1: Prescribed Herbivory Land and Trail Control**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
after vegetation treatment near sites with loose or unstable soils, on steep slopes (greater than 30 percent), where a large percentage of the groundcover would be removed, or near aquatic features that could be adversely affected by an influx of sediment. MM Geology-1 requires implementation of design features to minimize creation of livestock trails and congregation of livestock in any one location. MM Geology-2 requires that prescribed burns are performed outside of perennial streams and intermittent streams, riparian forest, and woodlands and requires a 50-foot buffer be maintained around perennial and intermittent streams when the prescribed burn is proposed upslope on slopes greater than 35 percent to reduce impacts from erosion contaminating nearby riparian areas or waterbodies. MM Geology-3 requires use of existing facilities for fire lines where they occur, implementation of erosion control measures during and after prescribed burns, follow up inspections, and restoration actions for new fire lines. Implementation of these measures would minimize the potential adverse impacts to less than significant.		Livestock will be used for vegetation management to reduce the use of chemical herbicides, to control invasive vegetation, and to promote the growth of native vegetation. Methods shall be implemented to reduce the potential creation of prescribed herbivory trails and erosional features, including the following: • Limit or prohibit prescribed herbivory within 100 feet of lakes/reservoirs, creeks, streams, riparian corridors, and wetlands, using fencing or natural features to prevent livestock from entering streams and riparian areas, depending upon a qualified professional's assessment. The following measures would be considered by the qualified professional and implemented where appropriate: – In riparian areas, livestock shall be excluded from the top of bank of a defined channel by installing fencing on the edge of riparian canopy where topography does not naturally exclude access. – Water and feed troughs shall be installed away from natural water sources. – In wetlands, livestock shall be excluded only where the percent cover of vegetation is low. • Implement methods, which could include rotating or providing multiple feeding areas to minimize excessive congregation of animals in any one location for too long, as determined by a qualified professional. • Limit the number of animals in a particular-sized area using the stocking-rate equation taking into account days assumed to graze, slope, yield of the land, number of animals, weight of animals, and other appropriate factors. • Conduct surveys of the prescribed herbivory area during active grazing; identify if trails or other erosion features are forming. • Ensure there are appropriate rest periods between active prescribed herbivory in any one area to allow regrowth of plants and appropriate amounts of residual dry matter (RDM) to remain on the ground to achieve desired vegetation-management objectives. • If prescribed herbivory trails or damaged areas form, the bare area shall be remediated by decompacting the soil and discontinuing prescribed herbivory in the area until the trails are revegetated, as determined by a qualified professional. • Excessive livestock grazing on steep slopes (generally slopes with more than 35 percent grade) shall be discouraged or avoided using the methods described above (e.g., water and feed trough locations, stocking-rate equation) or fencing where determined appropriate by a qualified professional. • During surveys of active prescribed herbivory, conduct ongoing surveillance of installed erosion control features around riparian areas and any fences installed. • Repair damaged fencing or erosion-control features as necessary. **MM Geology-2: Erosion Control and Slope Stability Measures** In addition to Midpen's erosion-control measures (IPMP BMP 28), control measures shall be implemented to ensure vegetation management does not result in erosion, loss of topsoil, or slope instability in areas where work could expose bare soils or create loss of root-soil matrix strength. If groundcover or native mulch/organic matter is determined to be less than 70 percent following work or work is proposed to occur on steep slopes (over 35 percent slope), then control measures, as identified here, shall be implemented as determined appropriate by the qualified personnel. Prior to conducting work in any given area under any management action that could result in erosion or slope instability (e.g., prescribed burns, tree removal, weed removal, or forest treatments that could reduce the groundcover and expose soil, or for infrastructure creation such as new roads, pipelines, or water storage tanks) the area shall be inspected for existing signs of erosion or slope instability (e.g., rills, slumped soil). Depending on the slope and the downslope resources (roads that could be impacted if a slope failed, waterbodies or habitat that could be impacted from erosion, important habitat, etc.), erosion and slope stabilization measures shall be determined prior to implementation of work, based on the list below. Generally, if an action would expose soils (leaving groundcover or native mulch/organic matter less than 70 percent), then measures to protect soils, minimize erosion, and prevent slope instability shall be implemented. The measures to be implemented shall depend on the site's specific characteristics and the type and extent of vegetation management work to be performed. The	

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation

inspection and determination of appropriate measures shall be made by qualified personnel with knowledge and experience (a person with a qualified SWPPP developer [QSD] or a qualified SWPPP practitioner [QSP]) in the application of erosion and slope-stabilization control measures through training or field experience with control measure installation. The qualified personnel shall memorialize in writing their field observations and corresponding recommendations regarding installation of control measures.

General Control Measures

The following measures shall be considered for implementation and required as determined appropriate by the qualified personnel during work as applicable:

- Minimize areas to be disturbed to the greatest extent feasible.
- Shut down use of heavy equipment, skidding, and truck traffic when soils become saturated and unable to support the machines.
- No substantial ground disturbing work (e.g., use of heavy equipment, pulling large vegetation) shall occur during rain events and 48 hours after a rain event, defined as 0.5 inch of rain within a 48-hour or greater period, using the NOAA website as the official record for rain events.

Reduced Groundcover Control Measures

The following measures shall be considered for implementation and required as determined appropriate by the qualified personnel during work if the activity may leave less than 70 percent of groundcover or native mulch/organic material and as applicable:

- Sow native grasses and other herbs on denuded areas where natural colonization or other replanting will not occur rapidly; use slash or chips to prevent erosion on such areas.
- Use surface mounds, depressions, logs, rocks, trees and stumps, slash and brush, the litter layer, and native herbaceous vegetation downslope of denuded areas to reduce sedimentation and erosion, as necessary to prevent erosion or slope destabilization.
- Install approved, biodegradable erosion-control measures and non-filament-based geotextiles (e.g., coir, jute) when:
  - Conducting substantial ground-disturbing work (e.g., use of heavy equipment, pulling large vegetation) within 100 feet and upslope of currently flowing or wet wetlands, streams, lakes, and riparian areas;
  - Causing soil disturbance on moderate to steep (10 percent slope and greater) slopes; and
  - Following the removal of invasive plants from stream banks to prevent sediment movement into watercourses and to protect bank stability.
- Sediment control devices, if installed, shall be certified weed-free, as appropriate. Sediment control devices shall be inspected daily during active construction to ensure that they are in good repair and working as needed to prevent sediment transport into the waterbodies (and repaired as needed).

Once work is completed, the areas shall be inspected as needed and as accessible but at least annually until groundcover exceeds 70 percent and it is clear that significant erosion and slope instability are not occurring. At that time, erosion control and slope stability devices may be removed at the discretion of District staff.

Steep Slopes Control Measures

The following measures, in addition to the ones described above, shall be considered for implementation and required as determined appropriate by the qualified personnel during work conducted on steep slopes (greater than 35 percent) and as applicable:

- Avoid use of heavy equipment on slopes greater than 35 percent unless specialized equipment is used that does not impact slope stability.

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		• Prescribed and pile burns shall be performed outside of perennial and intermittent streams and of riparian forest/ woodland. A 50-foot buffer around perennial and intermittent streams shall be maintained when the burn is proposed upslope of the stream on slopes greater than 35 percent. • Avoid installation of cleared areas, including spur roads or staging areas, on steep slopes, particularly over 50 percent slope, where feasible. Where not feasible, implement appropriate design and control measures including but not limited to those identified in *Low-Volume Roads Engineering* (Keller & Sherar, 2003) or other suitable engineering guidance, such as: – Locate roads on well-drained soils and slopes where drainage moves away from the road – Provide adequate surface drainage – Avoid wet and unstable areas (seeps, springs, etc.) – Use the natural topography to control or dictate the ideal location of road or cleared area (e.g., staging area); use saddles, follow ridges, use bench areas, etc. In areas of steep slopes (greater than 35 percent) that are located above infrastructure or sensitive habitat, a geologist shall perform an assessment if intensive tree removal (e.g., eucalyptus removal) is proposed to evaluate whether erosion and/or slope instability could occur from tree removal. Recommendations provided in the assessment shall be implemented as needed to ensure that slope instability does not occur. Recommendations could include measures such as stabilizing slopes with mats or natural materials after tree removal and replanting to bind soils. **MM Geology-3: Fire Lines During Prescribed Burns** The following measures shall be implemented during prescribed burns to reduce erosion from fire lines: • Use existing barriers such as roads, trails, or wet lines as fire lines. If new fire lines must be established for a prescribed burn, fire lines shall be restored as described below. • Restore fire lines upon completion of the burn if they are not used again (unless they are existing roads, trails, or other permanent elements). Utilize erosion-control measures, such as sediment traps, during restoration to reduce sedimentation impacts. Complete restoration activities within one month after a fire line is created unless the fire line is planned to be used during another burn within one year. Restore all fire lines that do not use existing infrastructure (i.e., roads, trails, or other permanent elements) within one year of use. Rehabilitation methods may include use of a hydromulch with locally collected, genetically appropriate, native species; pulling duff, litter, and cut material back over lines; and/or distribution of locally chipped fuels on the lines. • Design prescribed burn boundaries to avoid gullies and highly erodible soils to the fullest extent possible.	
Impact Geology and Soils-3: Instability of a geologic unit or soil that could potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse. Use of manual and mechanical techniques, prescribed herbivory, and prescribed burning would result in removal of vegetation and trees, which would cause soil instability and loss of root strength. Soil instability and loss of root strength could cause slope failure and increased landslide risks. Creating VMAs, installing fire lines, using heavy equipment, and clearing of access roads would remove vegetation and disrupt soils which could lead to increased landslide risk. Implementation of IPMP BMP 28 would reduce some risks but risks could still remain. MM Geology-2 and MM Geology-3 would minimize the potential for landslides to occur during or after Program activities are completed. Implementation of these measures would minimize the impacts to less than significant.	Potentially significant	**MM Geology-2: Erosion Control and Slope Stability Measures (see above)** **MM Geology-3: Fire Lines During Prescribed Burns (see above)**	Less than significant
Impact Geology and Soils-4: Impacts from expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), or corrosive soil, creating substantial direct or indirect risks to life or property. Expansive soils may be present in Ravenswood OSP and Stevens Creek Shoreline Nature Area where saturated bay mud occurs. New infrastructure may be constructed in these areas, which could create risk to infrastructure or property if located on an expansive soil.	Potentially significant	**MM Geology-4: Soil Assessment for Construction of New Water-Supply Pipelines** The following soil-assessment measures shall be implemented to ensure significant risks to life or property do not occur as a result of water-supply pipeline construction in an expansive soil in Ravenswood OSP or Stevens Creek Shoreline Nature Area:	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Implementation of MM Geology-4 would reduce the impact to less than significant level through conducting soils assessments prior to construction of new infrastructure and incorporating design standards to reduce the potential risk associated with soil expansion. Implementation of mitigation would minimize the impacts to less than significant.		1. Consult GIS data to determine if expansive soils may be present within the proposed construction site. 2. Conduct a field assessment using a proven scientific test or method, such as a soil expansion index test, to verify presence of expansive soils on the site. 3. If verified to be present, determine if the expansive soils can be avoided through design specifications. If appropriate design measures cannot be utilized to avoid expansive soils, no excavated soil shall be used for fill during construction; instead, clean fill soils with a low expansion potential shall be used.	
Impact Geology and Soils-5: Soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. No septic tanks or alternative wastewater disposal system would be installed as part of the Program. No impact would occur.	No impact	No mitigation measures are required.	N/A
Impact Geology and Soils-6: Direct or indirect impacts on a unique paleontological resource or site or unique geologic feature. No unique paleontological resources have been recorded within the Program area. Pleistocene alluvium has a moderate potential to yield paleontological resources within the Program area and the largest deposits are found in Sierra Azul and Rancho San Antonio OSPs. Several additional OSPs that contain Pleistocene alluvium only feature a small amount of this geologic unit and these areas are not likely to yield unique paleontological resources. Vegetation removal would not disturb soil depths in excess of shrub or tree roots. The potential for ground-disturbing activities to uncover, much less destroy, a unique paleontological resource, is unlikely.	Less than significant	No mitigation measures are required.	N/A
4.7 Greenhouse Gas Emissions			
Impact GHG-1: Generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment. GHG emissions associated with the Program implementation would be generated from emissions from mechanical equipment and vehicles, emissions from pile burning, and emissions from prescribed burning (Table 4.7-7). The majority of the GHG emissions are caused by the proposed prescribed burning activities. No thresholds for GHGs apply to the Program areas. GHG emissions impacts from implementation of the Program would be significantly increased through prescribed burning and would be potentially significant. Prescribed burning is becoming a more frequently used tool to reduce fuel loads and to improve ecosystem health in ecosystems that are adapted to periodic, low-intensity fire. The comparative GHG emissions of a catastrophic wildland fires in an area that did not previously benefit from reduced fuel loads due to VMA activities and prescribed fire are not quantifiable but are assumed to be much greater than the emissions from prescribed burning. MM Air Quality-2 requires consideration and implementation of measures to minimize prescribed burn and pile burn emissions, when and where appropriate. The impact would remain potentially significant and unavoidable.	Potentially significant	**MM Air Quality-2: Burn Emission Reduction Techniques (see Section 4.3: Air Quality above)**	Potentially significant and unavoidable
Impact GHG-2: Conflict with an applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. The Program would be consistent with applicable plans, policies, and regulations adopted for the purpose of reducing GHG emissions, including 2017 Scoping Plan, California Forest Carbon Plan, 2017 CAP, Midpen's Resource Management (RM) Polies, and San Mateo, Santa Clara, and Santa Cruz County's General Plans policies. The purpose of the Program is to reduce wildland fire risk, which could reduce GHG emissions and increase carbon sequestration over the long term.	Less than significant	No mitigation measures are required.	N/A

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
4.8 Hazards, Hazardous Materials, and Wildland Fire			
Impact Hazards-1: Significant hazard to the public or the environment through emission of or exposure to hazardous materials. Manual, mechanical, and chemical treatment options associated with the Program would result in activities that could require the transportation, use, and storage of herbicides, fuel, and other hazardous chemicals (see Table 4.8-3). Midpen would comply with all relevant regulatory requirements pertaining to the handling of hazardous materials, including herbicides. In addition, Midpen requires implementation of BMPs (IPMP BMPs 7, 9, 10, 34, 35; MO Manual Section 13.010, 14.005 17.005 and 17.006; Safety Manual Sections 1.6.5 and 1.6.6; Contract Conditions) to minimize the potential for adverse impacts to non-target species (i.e., humans, animals, and special-status species). Treatment options that require the transportation, use, and storage of hazardous materials associated with the Program would not result in the exposure of the public or environment to adverse conditions associated with the use of these materials. Impacts from emissions of or exposure to hazardous materials would be less than significant with implementation of BMPs.	Less than significant	No mitigation measures are required.	N/A
Impacts Hazards-2: Hazard to the public or the environment on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Three hazardous-materials sites listed on government databases remain open on Midpen lands at Sierra Azul OSP, Miramontes OSP, and Ravenswood OSP. Program activities are unlikely to occur around the Cooley Landing site at Ravenswood OSP. The VMP would involve some fire-management activities in and around the area of the former Almaden AFS in Sierra Azul OSP and the Madonna Creek Ranch site in Miramontes OSP. Disturbance of contamination at listed sites could pose a significant hazard to the public, workers, or the environment. Midpen would comply with all relevant regulatory requirements pertaining to the handling of asbestos-containing material. Furthermore, MM Hazards-1 requires preparation of a map showing the areas of residual contamination within the sites listed on government databases (e.g., former Almaden AFS) prior to any fire-management activities and avoidance of all contaminated areas unless they are remediated in the future and no hazardous materials remain. Implementation of MM Hazards-1 and compliance with applicable regulations would reduce the impacts on workers and the environment from existing hazards to less than significant.	Potentially significant	**MM Hazards-1: Avoidance of Contaminated Sites** To prevent exposure of workers to hazards or release of contamination into nearby waterways or clean soils, the following shall be conducted prior to any work within the boundary of any known contaminated sites or contaminated sites listed on government databases (e.g., the former Almaden AFS, Madonna Creek Ranch): • Existing data and reports on the areas of contamination and remediation, or the SFBRWQCB, shall be consulted and a map prepared identifying any areas with residual contamination (e.g., lead paint, asbestos, petroleum) that are still present after remediation. This map shall be updated at least annually if any fire management activity is proposed in the area. • The areas identified on the map as containing residual contamination shall be avoided either entirely (e.g., no cutting or entrance into site) or ground disturbing activities avoided (e.g., vegetation cutting allowed), depending upon a determination made by qualified personnel.	Less than significant
Impact Hazards-3: Safety hazard or noise related to project area located within an area covered by an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, affecting people residing or working in the project area. The majority of Midpen lands are not located within an airport land use plan or within the vicinity of a private airstrip. Ravenswood OSP is within 2 miles of the Palo Alto Airport, but it is not within the airport influence area. No impact would occur.	No impact	No mitigation measures are required.	N/A
Impact Hazards-4: Impairment of implementation or physical interference with an adopted emergency response plan or emergency evacuation plan. Fire management activities such as prescribed burning or conducting roadside mowing may require lane or full road closures that could interfere with evacuation along designated routes on Midpen lands. Hindering evacuation and emergency response could be a significant impact. MM Transportation-1 requires Midpen to make provisions to allow emergency responders through any work area or to clearly designate alternate routes. Implementation of MM Transporation-1 would ensure that unattended authorized work vehicles are not parked in such a way that blocks the road when there are no operators in attendance to move them and that the fire district and emergency response agencies have prior	Potentially significant	**MM Transportation-1: Emergency Responders and Access (see Section 4.12: Transportation below)**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
notification of temporary access road closures. Impacts would be less than significant with mitigation.			
Impacts Hazards-5: Exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. Some vegetation management activities could increase some risks of wildland fire ignition and spread during the actual performance of work, which requires the use of vehicles and equipment that could ignite a fire through generation of sparks or heat. Certain parts of Midpen lands could be more susceptible to fire ignition and spread, such as areas on steep slopes, south-facing slopes, and areas where significant fuel is found (e.g., dead trees and thick understories of weeds). Pile and prescribed burns also have a higher potential for starting a wildland fire, if the burns were to become uncontrolled, although this risk is very low and happens extremely rarely in practice. Midpen would implement several fuel spill prevention BMPs (Maintenance Operations Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Workers would not be permitted to smoke on Midpen lands, except in certain designated areas (LU Regulations 404.2). Midpen implements strict practices for operation of equipment and ensures that staff and contractors are trained in fire prevention and suppression techniques in the event operation of equipment ignites a fire (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0). Activities that could cause sparks within Midpen lands are required to cease during extreme fire weather (RM Policy WF-1). MM Hazards-2 and MM Hazards-3 require implementation of several measures to reduce risk of wildland fires associated with pile burning and prescribed burning. Impacts of exposing people or structures to a significant risk of loss, injury, or death involving wildland fires would be less than significant with implementation of BMPs and mitigation measures.	Potentially significant	**MM Hazards-2: Fire Risk Reduction for Stockpiling and Pile Burning** The following measures shall be implemented to reduce hazards associated with pile burning: • Pile burning shall only be allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph). • Piles shall not be constructed in areas where burning cannot be safely controlled, such as bottoms of steep, vegetated hills. • Piles shall be set back from roads and trails at a distance specified by Midpen to minimize risk to recreationalists and other users. • All requirements of the BAAQMD or MBARD shall be met, including any permit, notification, and reporting requirements. • Public notification shall be provided at least 24 hours in advance of a burn to individuals within one mile and at trailheads and access roads leading to the area with piles proposed for burning. The public notification shall include current contact numbers to the appropriate burn coordinator. **MM Hazards-3: Safety Around Prescribed Burns** **Trails and Midpen-Owned or Managed Roads** Midpen-owned or managed roads and trails shall be closed to public recreational and other unaffiliated private vehicle (e.g., County or private landowner vehicles on Midpen managed but not owned land) access within at least 500 feet of the outermost edges of a prescribed burn (or less with Burn Boss and Midpen concurrence). Midpen-owned or managed roads and trails shall be posted and blockaded with temporary fencing or the like. Notices of closures shall be posted at the trail heads or road entrances and on Midpen's website. Additional measures, such as staffing trail head closures, can be implemented as needed. **Public Roads** If possible, public roads within 500 feet of the outermost edges of a prescribed burn shall be closed in coordination with the appropriate agency (e.g., Caltrans). In the event this is not feasible due to volume of traffic or lack of alternative routes, a Traffic Control Plan shall be prepared and adopted in coordination with the appropriate agency. The Traffic Control Plan shall be designed to allow safe passage along roads adjacent to a prescribed burn and shall include the following at a minimum: • Requirement to coordinate with local law enforcement (e.g., County Sheriff, California Highway Patrol). • Installation of temporary signage at intervals ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress. • Use of flaggers to slow traffic during the burn or stop traffic if wind conditions shift, resulting in smoke crossing the road.	Less than significant
Impact Hazards-6: Exacerbation of wildland fire risks due to slope, prevailing winds, or other factors, that could expose project occupants to pollutant concentrations from a wildland fire or the uncontrolled spread of a wildland fire. Some activities, including prescribed burning and use of vehicles and equipment, could increase the risk of wildland fire ignition during implementation of the activity, which could be considered significant. Midpen would comply with applicable policies and regulations to minimize wildland fire risk by requiring implementation of Midpen fuel spill prevention measures and IPMP BMPs, preparation of Smoke Management Plans, and avoidance of activities that could spark a fire during extreme fire weather. MM Hazards-2 requires implementation of several measures to reduce risk of wildland fire associated with pile burning. These measures would reduce risk of activities associated with activities starting a wildland fire to less than significant.	Potentially significant	**MM Hazards-2: Fire Risk Reduction for Stockpiling and Pile Burning (see above)**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
Impact Hazards-7: Installation or maintenance of roads, fuel breaks, emergency water sources, power lines or other utilities that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment. Several activities proposed under the Program would involve installation, construction, or maintenance of infrastructure, such as fuelbreaks, roads, and water tanks or pipelines. The VMAs and proposed firefighting infrastructure would minimize spread of wildland fires and aid in firefighting efforts. The infrastructure, once installed, would not exacerbate fire risks and would be beneficial. The potential environmental impacts of installing and constructing the proposed infrastructure are analyzed throughout this EIR under the VMP and Wildland Fire Pre-Plan. Mitigation measures are identified as applicable to minimize impacts to less than significant.	Potentially significant	**MM Aesthetics-1: Reduction of Visual Impacts from Scenic Roads, Corridors, Trails, and Viewpoints from VMAs (see Section 4.2: Aesthetics above)** **MM Aesthetics-2: Guidelines for Design of Roads, Landing Zones, or Staging Areas (see Section 4.2: Aesthetics above)** **MM Air Quality-1: Fugitive Dust Control Measures for Infrastructure Installation (see Section 4.3: Air Quality above)** **MM Air Quality-3: Asbestos Management (see Section 4.3: Air Quality above)** **MM Biology-1: Training, Monitoring, and Reporting (see Section 4.4: Biological Resources above)** **MM Biology-2: Special-Status Plants (see Section 4.4: Biological Resources above)** **MM Biology-3: Compensatory Mitigation for Impacts to Special-Status Plants (see Section 4.4: Biological Resources above)** **MM Biology-4: Invasive Plants and Soil Pathogens (see Section 4.4: Biological Resources above)** **MM Biology-5: Invasive Plant Detection and Response (see Section 4.4: Biological Resources above)** **MM Biology-6: San Francisco Garter Snake Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-7: California Red-Legged Frog Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-8: Foothill Yellow-Legged Frog Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-9: Western Pond Turtle Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-10: California Giant Salamander, Santa Cruz Black Salamander, and Red-Bellied Newt Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet) (see Section 4.4: Biological Resources above)** **MM Biology-12: Marbled Murrelet Nest Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-13: Special-Status Insect Host Plant Protection (see Section 4.4: Biological Resources above)** **MM Biology-14: Salmonid Protection Measures (see Section 4.4: Biological Resources above)** **MM Biology-15: Monarch Butterfly Overwintering Aggregation Protection (see Section 4.4: Biological Resources above)** **MM Biology-17: Sensitive Natural Communities (see Section 4.4: Biological Resources above)** **MM Biology-18: Compensatory Mitigation for Impacts to Sensitive Natural Communities (see Section 4.4: Biological Resources above)** **MM Biology-19: Wetlands and Other Potentially Jurisdictional Aquatic Resources (see Section 4.4: Biological Resources above)** **MM Biology-20: Significant and Heritage Tree Ordinances (see Section 4.4: Biological Resources above)** **MM Cultural-1: Pre-Activity Surveys and Avoidance of Impacts to Cultural Resources (see Section 4.5: Cultural and Tribal Cultural Resources above)** **MM Cultural-2: Treatment of Unavoidable Resources (see Section 4.5: Cultural and Tribal Cultural Resources above)** **MM Cultural-3: Human Remains (see Section 4.5: Cultural and Tribal Cultural Resources above)** **MM Geology-1: Prescribed Herbivory Land and Trail Control (see Section 4.6: Geology and Soils above)** **MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils above)** **MM Geology-4: Soil Assessment for Construction of New Water-Supply Pipelines (see Section 4.6: Geology and Soils above)** **MM Hazards-1: Avoidance of Contaminated Sites (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire)** **MM Hydrology-1: Water Quality Protection During Waterway Crossing or Work Near Waterbodies (see Section 4.9: Hydrology and Water Quality below)**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		MM Noise-1: Noise Restrictions (see Section 4.10: Noise below) **MM Transportation-1: Emergency Responders and Access (see Section 4.12: Transportation below)**	
Impact Hazards-8: Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. Prescribed burns have the potential to change the soil profile, resulting in the top layer eroding in the short-term before new growth comes back, which could increase slope instability. MM Geology-2 and MM Geology-3 require installation of erosion control measures to stabilize the soils and use of existing facilities for fire lines where they occur to reduce the potential for landslides, which would reduce impacts to less than significant.	Potentially significant	**MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils above)** **MM Geology-3: Fire Lines During Prescribed Burns (see Section 4.6: Geology and Soils above)**	Less than significant
		4.9 Hydrology and Water Quality	
Impact Hydrology-1: Violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality, or substantially alter the existing drainage pattern of the area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on or off site. Vegetation management activities would result in some minor modification to the hydrologic conditions in the Program area. Water quality impacts from sedimentation and siltation of waterbodies or waterways would occur primarily from the actions associated with vegetation treatments and non-native shrub and understory removal. Sedimentation can increase downstream turbidity, which is considered a water quality impact. Sediment runoff can carry heavy metals (e.g., mercury, arsenic and copper) and nutrients (e.g., phosphorus and nitrogen), and biological pathogens (e.g., coliform, cryptosporidium, and giardia). Several waterways and waterbodies that currently do not meet water quality objectives under Section 303(d) are located within and surrounding Midpen lands. The impaired waterbodies and waterways are included in Table 4.8-3. MM Geology-1 requires that prescribed herbivory not be located within 100 feet of a waterbody or waterway. MM Geology-2 and MM Geology-3 require implementation of additional erosion control measures to avoid or minimize erosion associated with sedimentation of waterways or waterbodies specifically where groundcover would be reduced to less than 70 percent. MM Hydrology-1 includes measures that pertain to stream or other waterway crossings that could be needed on a rare occasion when working on FRAs. Implementation of these measures would reduce impacts on water quality to less than significant.	Potentially significant	**MM Geology-1: Prescribed Herbivory Land and Trail Control (see Section 4.6: Geology and Soils above)** **MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils above)** **MM Geology-3: Fire Lines During Prescribed Burns (see Section 4.6: Geology and Soils above)** **MM Hydrology-1: Water Quality Protection During Waterway Crossing or Work Near Waterbodies** Vehicles and heavy equipment shall avoid instream crossings. On rare occasions, such as to perform work to create or maintain FRAs, equipment may need to access off an existing road into a treatment area through a waterbody. If instream (waterway) crossings must occur because no other options for access are reasonably available, the crossing shall be performed when the stream is dry and soils are not saturated. The crossing shall be performed in a way that does not result in any permanent alteration of the stream bank or bed (e.g., choosing areas with stable soils and the least slope or with vegetation to protect the bed and bank). If water is flowing or the stream has flow or saturation, temporary plates or the equivalent shall be installed from bank to bank for equipment access across the waterway. If an instream crossing that could impact the bank or bed or riparian vegetation is needed, the crossing shall only be performed after and in accordance with the appropriate 1602 Streambed Alteration Agreement from CDFW and Section 404 and 401 Clean Water Act permits. All soils shall be restored after the instream crossing and banks revegetated, as needed, after the work is completed, in accordance with permits.	Less than significant
Impact Hydrology-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Program may impede sustainable groundwater management of the basin. The majority of Midpen lands are located upgradient of the Santa Clara Valley groundwater basin and no substantial groundwater basins are located beneath Midpen lands. The Santa Clara subbasin (Basin 2-009.03) is rated as high priority under the Sustainable Groundwater management Act (SGMA). Valley Water is the groundwater sustainability agency (GSA) for the Santa Clara subbasin, which is sustainably managed through the comprehensive activities described in Valley Water's 2016 Groundwater Management Plan. Midpen currently does not use groundwater because of limited groundwater production capabilities in the area. Implementation of the Program would not result in impacts related to depletion of groundwater supplies nor the implementation of Valley Water's 2016 Groundwater Management Plan.	Less than significant	No mitigation measures are required.	N/A
Impact Hydrology-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) substantially increase the rate or amount of surface runoff	Potentially significant	**MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils above)** **MM Hydrology-1: Water Quality Protection During Waterway Crossing or Work Near Waterbodies (see above)**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
in a manner which would result in flooding on- or off-site; ii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iii) impede or redirect flood flows. Physical alteration of streams or rivers and substantial increase of impervious surface are not proposed for the Program. However, unintentional alteration of streams or rivers could occur from landslides or debris flows resulting from vegetation management activities or from sedimentation caused by erosion. The minor addition of impervious surface from proposed infrastructure would occur as a part of Program implementation. Implementation of prescribed burns could expose soils and potentially alter drainage patterns through increased surface runoff. Surface water flows may also increase in areas where new or expanded roads and wildland fire infrastructure are added. MM Geology-2 and MM Hydrology-1 would be implemented to reduce impacts to less than significant.			
Impact Hydrology-4: Risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. The Program covers a hilly, mountainous, primarily inland area, which precludes the chance of the area being inundated by tsunami. Midpen participates in flood protection programs throughout the region. Risk of tidal flooding is prevalent in Ravenswood and Stevens Creek OSPs; however, vegetation management and soil disturbing activities are not proposed for these areas under the VMP. Seiche events are not likely to occur within Midpen lands due to site elevation and distance from the Pacific Ocean and San Francisco Bay.	Less than significant	No mitigation measures are required.	N/A
Impact Hydrology-5: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. All surface waterbodies identified in Table 4.8-3 downstream of Midpen lands could be impacted by additional contaminants as a result of Program implementation. Increased contamination of an impaired waterbody or waterway, such as additional sedimentation in San Gregorio Creek or San Francisquito Creek, would conflict with the Basin Plan. A small portion of Midpen lands are located within the Santa Clara subbasin and are subject to Valley Water's 2016 Groundwater Management Plan goals and strategies. As discussed under Impact Hydrology-2, Program activities would not result in impacts related to depletion of groundwater supplies. MM Geology-1, MM Geology-2, and MM Geology-3 require implementation of additional erosion control measures to minimize erosion associated with specific Program activities including prescribed herbivory, prescribed burns and pile burns near waterways or waterbodies, and creation of new fire lines. MM Hydrology-1 requires that instream crossings be avoided to the greatest extent feasible. Implementation of these measures would reduce impacts on Basin Plan to less than significant.	Potentially significant	**MM Geology-1: Prescribed Herbivory Land and Trail Control (see Section 4.6: Geology and Soils above)** **MM Geology-2: Erosion Control and Slope Stability Measures (see Section 4.6: Geology and Soils above)** **MM Geology-3: Fire Lines During Prescribed Burns (see Section 4.6: Geology and Soils above)** **MM Hydrology-1: Water Quality Protection During Waterway Crossing or Work Near Waterbodies (see above)**	Less than significant
4.10 Noise			
Impact Noise-1: Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the program in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Use of mechanical tools, chemical application and prescribed burning equipment, generators, and other heavy equipment could generate daytime noise that exceeds general acceptable noise levels established by the counties where Midpen lands are located. If unnecessarily excessive noise is generated near sensitive receptors, it has the potential to conflict with local noise standards. MM Air Quality-3, MM Air Quality-4, MM Hazards-3, and MM Noise-1 require that the appropriate buffer distances are established when implementing prescribed burning and operating certain types of equipment near sensitive receptors. Noise can also have impacts on biological resources. Refer to Section 4.4 for	Potentially significant	**MM Air Quality-3: Asbestos Management (see Section 4.3: Air Quality above)** **MM Air Quality-4: Midpen Employee Protection from Prescribed and Pile Burn Air Pollutants (see Section 4.3: Air Quality above)** **MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet) (see Section 4.4: Biological Resources above)** **MM Biology-12: Marbled Murrelet Nest Protection Measures (see Section 4.4: Biological Resources above)** **MM Hazards-3: Safety Around Prescribed Burns (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire above)** **MM Noise-1: Noise Restrictions**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
a discussion of noise impacts on sensitive species, particularly marbled murrelet and nesting birds. These impacts are mitigated through MM Biology-11 and -12. Noise impacts would be reduced to less than significant with implementation of these measures.		**Construction Hours** All construction hours identified in the local noise ordinances shall be followed. **Buffer Zones (Santa Clara and Santa Cruz counties)** Buffer zones shall be established to reduce noise at sensitive receptors to the maximum extent feasible to reduce noise to the conditional limits identified by Santa Clara and Santa Cruz counties' noise ordinances. The buffer zone distances are shown below that identify the distances needed for noise levels to remain below 75 dBA L_{eq} for work occurring less than 10 days, and below 60 dBA L_{eq} for work occurring for 10 days or longer in Santa Clara County and below 75 dBA Leq for Santa Cruz County. These distances do not need to be implemented where it is not technically feasible to implement them per the applicable noise ordinances that requires that noise must only be reduced where it is possible to do so (i.e., Santa Clara County Noise Ordinance, or considering the necessity of the work in Santa Cruz County). A violation of the noise ordinances would only occur where the noise exceeded the conditional limits set by the jurisdiction, but there is a feasible way to reduce that noise (e.g., placing a chipper within 50 feet of a receptor when it could feasibly be placed 100 feet away is a violation, but using a chainsaw to cut a large hazard tree within 50 feet of a sensitive receptor would not be a violation assuming no other feasible methods to remove that tree are available).	

Equipment	Approximate Buffer Between Equipment and Sensitive Receptors (feet) – for Work Occurring in One Location for Less Than 10 Days (Not to Exceed 75 dBA L_{eq}) in Santa Clara County or for any work duration in Santa Cruz County	Approximate Buffer Between Equipment and Sensitive Receptors (feet) – for Work Occurring in One Location for 10 Days or Longer (Not to Exceed 60 dBA L_{eq}) in Santa Clara County
Chipper	100	568
Tractor	90	506
Generator/ water pump	71	402
Chainsaw/ excavator	64	358
Skid steer	--	284
Backhoe/ brushcutter	--	254
Fire engine/ crane	--	226
Leaf blower	--	201
Pickup truck	--	179
Power pole saw	--	80

Minimization Measures and Disturbance Coordinator
If these restrictions are not implementable between the receptors and a given location, Midpen shall notify the resident or contact at the sensitive receptor within one week of conducting the activity to schedule the activity. Activities shall be coordinated to minimize disturbance to the receptor, such as conducting the work when no one is there. Engineering controls could also be used, if feasible, to keep noise levels below 75 dBA Leq for work occurring in one location for less than 10 days

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
		or 60 dBA Leq for work occurring in one location for 10 days or longer. Midpen shall designate a disturbance coordinator to address any noise complaints under these circumstances. The noise coordinator can be the person performing the work.	
Impact Noise-2: Generate excessive groundborne vibration or groundborne noise levels. No equipment that could generate a substantial amount of vibration, such as an impact pile driver or compactor, would be used. Ground vibration from heavy equipment and trucks dissipates within a close distance of the source. Equipment and trucks would rarely be used within 10 feet of buildings. Activities would be temporary and periodic. The impact from vibration would be less than significant.	Less than significant	No mitigation measures are required.	N/A
Impact Noise-3: For a program located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, the proposed program could expose people residing or working in the project area to excessive noise levels. The majority of Midpen lands are not located within an area with an airport land use plan or within the vicinity of a private airstrip. Ravenswood OSP is within 2 miles of the Palo Alto Airport but is not within the airport influence area. Implementation of the Program would not result in excessive noise levels for receptors in the area from being located within an adopted airport land use plan or near public airports or private airstrips.	No impact	No mitigation measures are required.	N/A
		4.11 Recreation	
Impact Recreation-1: Increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or necessitate construction or expansion of recreational facilities. Activities proposed as part of the Program would involve prescribed burning and use of equipment and vehicles that may result in trail and road closures, limiting recreational opportunities within Midpen lands, which could increase use of other recreational facilities resulting in deterioration. Closures would not affect a substantial number of recreationalists or substantially limit use of Midpen lands due to the relatively small subset of the overall quantity of roads and trails that would be closed at any one time. Various activities could alter the visual character of some areas, potentially affecting the recreational experience if the visual character is significantly degraded or availability of recreational areas diminished on Midpen lands to the level that recreationalists would significantly increase use of other facilities leading to deterioration. Smoke and other related safety hazards caused by prescribed burns could impact the experience of recreationalists. Midpen requires use of warning signs or trail closure signs during operation of heavy equipment, as well as a spotter to warn the equipment operator of and control visitors around equipment (MO Manual Section 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). Implementation of MM Hazards-3 would reduce impacts from hazards to recreationalists from prescribed burns. The impacts on the recreational experience and availability of recreational areas to the extent that other resources would be used would be less than significant with mitigation.	Potentially significant	**MM Hazards-3: Safety Around Prescribed Burns (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fires above)**	Less than significant
		4.12 Transportation	
Impact Transportation-1: Increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) or conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities. Roads and intersections would not be modified, redesigned, or require maintenance as a part of the Program. No changes to the use of existing roadways would occur. Prescribed burn (staging or smoke) and roadside fuelbreak construction	Potentially significant	**MM Hazards-3: Safety Around Prescribed Burns (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire above)**	Less than significant

Impact Description	Level of Significance Before Mitigation	Mitigation Measure	Level of Significance After Mitigation
or maintenance could temporarily impact traffic through lane or road closures. Implementation of MM Hazards-3 would reduce traffic impacts to less than significant.			
Impact Transportaiton-2: Conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b). During typical vegetation management activities, the maximum number of workers would be 30. Average daily, one-way vehicle trips throughout the year would range from approximately 6 trips to 60 trips (or less). The net new, average daily number of one-way vehicle trips associated with the Program could increase nominally but would not exceed the screening threshold of 110 trips per day. Impacts would be less than significant.	Less than significant	No mitigation measures are required.	N/A
Impact Transportation-3: Inadequate emergency access. Fuelbreaks adjacent to identified evacuation routes and designated Wildland Type 3 routes would be created and maintained as a part of the Program, allowing for safer and more efficient emergency access. As part of the Program, firefighting infrastructure, including access roads and staging locations, would be improved upon and potentially created in areas where adequate access is lacking. Several of the methods and activities proposed as part of the Program, including prescribed burning and mowing, could require lane or full road and trail closures that could slow or prevent emergency access into or through Midpen lands. MM Transportation-1 requires Midpen to implement provisions to allow access for emergency responders across or through any work site. Implementation of mitigation would ensure that emergency vehicles are provided access resulting in a less than significant impact.	Potentially significant	**MM Transportation-1: Emergency Responders and Access** The following measures shall be implemented to ensure emergency access is maintained: 1. At least one week prior to temporary lane or full closure of a public road, Midpen shall contact the appropriate emergency response agency/agencies with jurisdiction (e.g., CalTrans, County, City) to ensure that each agency is notified of the closure and any temporary detours in advance. 2. In the event of an emergency, roads (public roads, and Midpen-owned or managed roads) or access trails blocked or obstructed by activities shall be cleared to allow emergency vehicles to pass. 3. During temporary lane or road closures on public roads, Midpen shall use flaggers equipped with two-way radios. During an emergency, flaggers shall radio to the crew to cease operations and reopen the public road to emergency vehicles. 4. In work areas, all vehicles and equipment shall be parked so the road is not blocked or obstructed when there is no operator present to move the vehicle.	Less than significant

3 Project Description

3.1 Introduction

The Wildland Fire Resiliency Program documents and permits the various planning efforts needed to meet Midpen's objectives for establishing wildland fire resiliency on its lands. It is meant to guide a comprehensive approach to vegetation management, including pre- and post-response activities to wildland fire on Midpen lands. The Program is a comprehensive document that includes the following components:

- **Introduction:** Provides an overview of Midpen lands, management, and purpose of the Program;
- **Background and Environmental Setting:** Describes the open space preserves and managed land system, resources, landscape, and other current site conditions;
- **Wildland Fire Resiliency Program Policies:** Identifies Midpen's Resource Management Policies (RM Policies) that require updating to support the Program;
- **Vegetation Management Plan (VMP):** Addresses creation and maintenance of fuelbreaks, fuel management zones, and defensible space zones using vegetation management techniques addressed in Midpen's IPMP;
- **Prescribed Fire Plan (PFP):** Addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health;
- **Wildland Fire Pre-Plans/Resource Advisor Maps:** Describes the creation of Resource Advisor maps for each open space preserve (OSP) and other managed land (or groups of managed lands) that would include information on existing conditions, infrastructure, and resources constraints to aid fire suppression activities and locate sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities;
- **Monitoring Plan:** Provides a framework for recording pre-project conditions, vegetation treatment response, and fuels inventories to inform future adaptive management techniques; and
- **Maximum Acreage of Annual Treatment:** Describes the maximum treatment areas by activity per year.

This Project Description incorporates the entire Program by reference and summarizes the key components necessary for CEQA analysis. The Program should be reviewed in its entirety, for a thorough understanding of all actions and components of the Program.

3.2 Program Location and Surrounding Area

3.2.1 Overview

Midpen is a public agency formed by voter initiative in 1972. Midpen's purpose is to acquire and permanently protect a regional greenbelt of open space lands, preserve and restore wildlife habitat, watersheds, viewsheds, and fragile ecosystems, and provide opportunities for low-intensity recreation and environmental education. In 2004, Midpen expanded to protect the San Mateo County Coast. Reflecting the interests of Coastside residents, Midpen's mission on the San Mateo County Coastside includes preserving the rural character and agricultural heritage of the coastside and encouraging viable agricultural use of land resources. Midpen's mission outlines the critical functions of the agency, balancing the preservation of open space with active land restoration, low-intensity public recreation, and viable agricultural use.

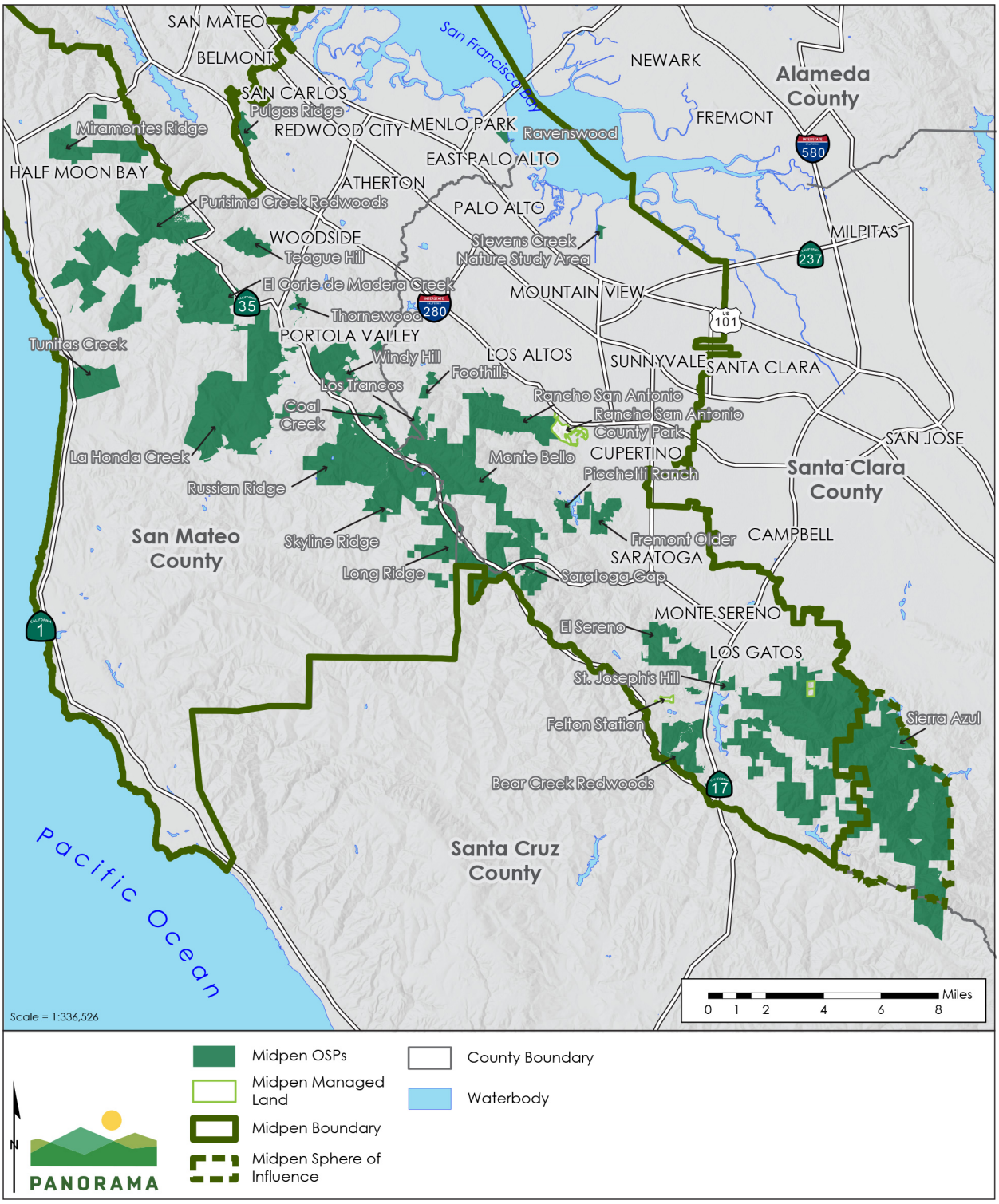
3.2.2 Preserve System

Midpen has preserved a regional greenbelt system of nearly 65,000 acres of public land and manages 26 OSPs and other land under management agreements (referred to as "Midpen lands" throughout this document) (Figure 3.2-1). The Program addresses wildland fire management across all Midpen owned and managed lands. Table 3.2-1 summarizes key information for each of the 26 OSPs and other Midpen-managed lands. As Midpen continues to expand its land holdings, the amount of vegetation management work conducted under the Program within its lands is expected to also increase. Midpen continues to actively acquire new lands to preserve as open space in perpetuity. Midpen lands depicted on maps throughout the Program EIR represent the conditions at the time of preparation. The lands covered by the Program are subject to change as Midpen continues to actively acquire new lands.

3.2.3 Nearby Communities and Development

Midpen's jurisdiction encompasses 17 cities (Atherton, Cupertino, East Palo Alto, Half Moon Bay, Los Altos, Los Altos Hills, Los Gatos, Menlo Park, Monte Sereno, Mountain View, Palo Alto, Portola Valley, Redwood City, San Carlos, Saratoga, Sunnyvale, and Woodside) and unincorporated areas in San Mateo, Santa Clara, and northern Santa Cruz counties with a combined population of over 700,000 residents. Although land uses within OSPs are predominantly natural open space and agriculture (primarily conservation grazing), many of the OSPs abut small areas of low-density residential development. The majority of land owned by Midpen is within the wildland-urban interface (WUI), which poses significant concern in the event of fire, as it combines the characteristics of wildlands (where larger fires generally occur) and developed areas (where lives, homes, and property are vulnerable).

Figure 3.2-1 Program Location



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a)

Table 3.2-1 Summary of Midpen Lands

Managed Land	Acres	Description
Bear Creek Redwoods OSP	1,437	• Major amenities: trails open to hiking and horseback riding, stables, historical/cultural artifacts, historic complex, Upper Lake, restrooms, parking lot • Major uses: recreation, horse boarding • Primary vegetation: redwood and fir forests, oak woodland
Coal Creek OSP	508	• Major amenities: trails open to hiking, horseback riding, biking, and dogs on-leash • Major uses: recreation • Primary vegetation: oak woodland, grassland
El Corte de Madera Creek OSP	2,906	• Major amenities: trails open to hiking, horseback riding, and biking; coastal views; sandstone formation; picnic tables; creeks; restrooms; parking lots • Major uses: recreation • Primary vegetation: mixed evergreen and redwood forest
El Sereno OSP	1,430	• Major amenities: trails open to hiking, horseback riding, biking, and dogs on-leash; creeks; permit parking • Major uses: recreation, fire escape route • Primary vegetation: chaparral
Felton Station	44	• Not currently open to the public
Foothills OSP	212	• Major amenities: trail open to hiking, horseback riding, and dogs on-leash; scenic viewpoint; roadside parking • Major uses: recreation • Primary vegetation: chaparral, oak woodland
Fremont Older OSP	739	• Major amenities: trails open to hiking, biking, and dogs on-leash; benches; restrooms; historic residence; parking lot and roadside parking • Major uses: recreation • Primary vegetation: chaparral, grassland, oak woodlands
La Honda Creek OSP	6,144	• Major amenities: trails open to hiking, horseback riding, and dogs on-leash; vista point; active grazing; creeks; restrooms; historic barns; residences; parking lots • Major uses: agriculture, recreation, coastal field office • Primary vegetation: redwood and oak forests, grassland
Long Ridge OSP	2,226	• Major amenities: trails open to hiking, horseback riding, biking, and dogs on-leash; benches; scenic vistas; ponds; creeks; roadside parking • Major uses: recreation • Primary vegetation: grassland, hardwood forest, oak savanna
Los Trancos OSP	274	• Major amenities: trails open to hiking and horseback riding, San Andreas fault trail, benches, creeks, restrooms, parking lot and roadside parking • Major uses: recreation • Primary vegetation: forest, grassland, oak woodland

Managed Land	Acres	Description
Miramontes Ridge OSP	1,716	• Not currently open to the public • Major uses: agriculture, horse stable • Primary vegetation: coastal scrub
Monte Bello OSP	3,537	• Major amenities: trails open to hiking, horseback riding, and biking; scenic vistas; campsite; creeks; benches; restrooms; parking lot • Major uses: recreation • Primary vegetation: chaparral, forest, grassland
Picchetti Ranch OSP	308	• Major amenities: trails open to hiking and horseback riding, vineyard, ponds, restrooms, historic homestead and ranch, Picchetti Winery, picnic tables, parking lots and roadside parking • Major uses: agriculture/winery, recreation, small events • Primary vegetation: chaparral, oak woodland
Pulgas Ridge OSP	366	• Major amenities: trails open to hiking and dogs on-leash, benches, restrooms, off-leash dog area, parking lot • Major uses: recreation • Primary vegetation: chaparral, hardwood forest
Purisima Creek Redwoods OSP	4,798	• Major amenities: trails open to hiking, horseback riding, and biking; creeks; scenic vistas; picnic tables; benches; restrooms; parking lots; active grazing • Major uses: agriculture, recreation • Primary vegetation: coastal scrub, redwood forest
Rancho San Antonio OSP	3,988	• Major amenities: trails open to hiking, horseback riding, and (limited) biking; benches; water troughs; vista points; Deer Hollow Farm and ranch buildings; Foothills Field Office; historic Grant Cabin; restrooms; parking lots • Major uses: education, agriculture/farming, recreation, maintenance and patrol field office • Primary vegetation: chaparral, hardwood forest
Rancho San Antonio County Park	287	• Major amenities: trails open to hiking, horseback riding, and (limited) biking; picnic tables; benches; model aircraft field; water troughs; vista points; restrooms; parking lots • Major uses: recreation • Primary vegetation: grassland, oak woodland
Ravenswood OSP	374	• Major amenities: trails open to hiking and biking, benches, observation decks, boardwalk, parking lot • Major uses: recreation, commuter route • Primary vegetation: marshland
Russian Ridge OSP	3,491	• Major amenities: trails open to hiking, horseback riding, and biking; viewing platforms; creeks; commemorative site; restrooms; parking lots; active grazing • Major uses: agriculture, recreation • Primary vegetation: conifer forest, grassland

Managed Land	Acres	Description
Saratoga Gap OSP	1,613	• Major amenities: trails open to hiking, horseback riding, and biking; sandstone rock outcrops; parking lots and roadside parking • Major uses: recreation • Primary vegetation: oak and Douglas fir forests
Sierra Azul OSP and Easements	19,023	• Major amenities: trails open to hiking, horseback riding, biking, and dogs on-leash; scenic vistas; shade structures; picnic tables; water troughs; Mount Umunhum Summit; Ceremonial Space; natural/cultural interpretation restrooms; parking lots and roadside parking • Major uses: recreation • Primary vegetation: chaparral, oak woodland forest, serpentine grassland
Skyline Ridge OSP	2,143	• Major amenities: trails open to hiking, horseback riding, and biking; picnic tables; Alpine Pond; Horseshoe Lake; creeks; multimedia nature tours; David C. Daniels Nature Center; Skyline field office; restrooms; parking lot • Major uses: agriculture, recreation, maintenance and patrol field office • Primary vegetation: grassland, mixed evergreen forest
St. Joseph's Hill OSP	270	• Major amenities: trails open to hiking, horseback riding, biking, and dogs on-leash; benches; scenic vistas; roadside parking • Major uses: recreation • Primary vegetation: chaparral, grassland, oak woodland
Stevens Creek Shoreline Nature Study Area	55	• Major amenities: trails open to hiking and biking, parking lots • Major uses: recreation • Primary vegetation: wetland
Teague Hill OSP	626	• Major amenities: trails open to hiking and horseback riding • Major uses: recreation • Primary vegetation: Douglas fir, oak, madrone forest
Thornewood OSP	167	• Major amenities: trails open to hiking, horseback riding, and dogs on-leash; Schilling Lake; parking lot; historic residence • Major uses: recreation • Primary vegetation: oak and redwood forest
Tunitas Creek OSP	1,660	• Not currently open to the public • Major uses: agriculture • Primary vegetation: coastal scrub
Windy Hill OSP	1,414	• Major amenities: trails open to hiking, horseback riding, biking, and dogs on-leash; benches; picnic tables; Sausal pond; restrooms; parking lots and roadside parking; historic complex • Major uses: recreation • Primary vegetation: grassland, oak, and redwood forest

Notes:

Midpen has actively preserved nearly 65,000 acres, of which approximately 60,000 acres are managed by Midpen; the remaining acreage is managed by other park and open space entities.

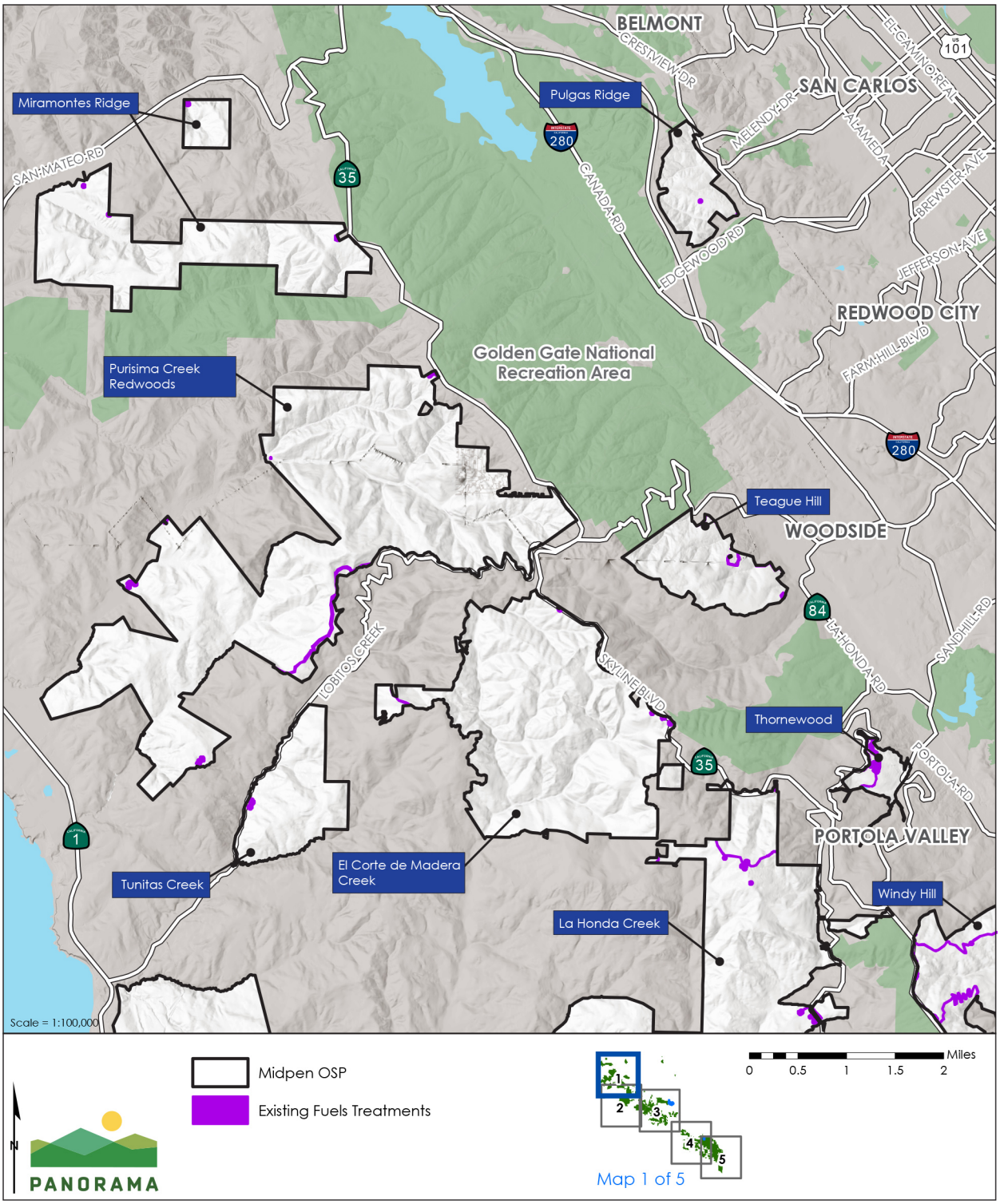
3.3 Background and History of Fuel Management on Midpen Lands

3.3.1 Overview

Prior to European contact, Native American tribes actively managed vegetation within their communities and surrounding areas using fire. These fires were lit intentionally at various times of the year to enhance vegetation growth, facilitate food collection, and improve forage for animals they hunted. Native American tribes did not actively suppress natural lightning ignitions at a landscape scale, which resulted in fires burning for days, weeks, and even months, shaping the patterns of vegetation cover and composition over the centuries (Anderson, 2013). This fire regime has been significantly altered due to fire suppression, which has been implemented by federal and state agencies throughout California for more than a century. Fire suppression has reduced biodiversity on lands that Midpen now owns or manages and has facilitated the spread of invasive plant species into grasslands and other plant communities. In the absence of decades of fire, both live and dead fuels have accumulated in some areas. This accumulation creates higher surface fuel loads, vegetation density, and varied species composition from what was seen prior to European contact. Midpen currently implements several fuel management programs across its lands, which include a wide variety of fuel management treatments that Midpen currently implements including the IPMP. Existing treatments on Midpen lands conducted according to these programs are shown in Figure 3.3-1 through Figure 3.3-5 (refer to Appendix 3.0-1 for detailed maps showing existing treatment areas). The actions related to fuel maintenance and reduction and fire management that are currently implemented include:

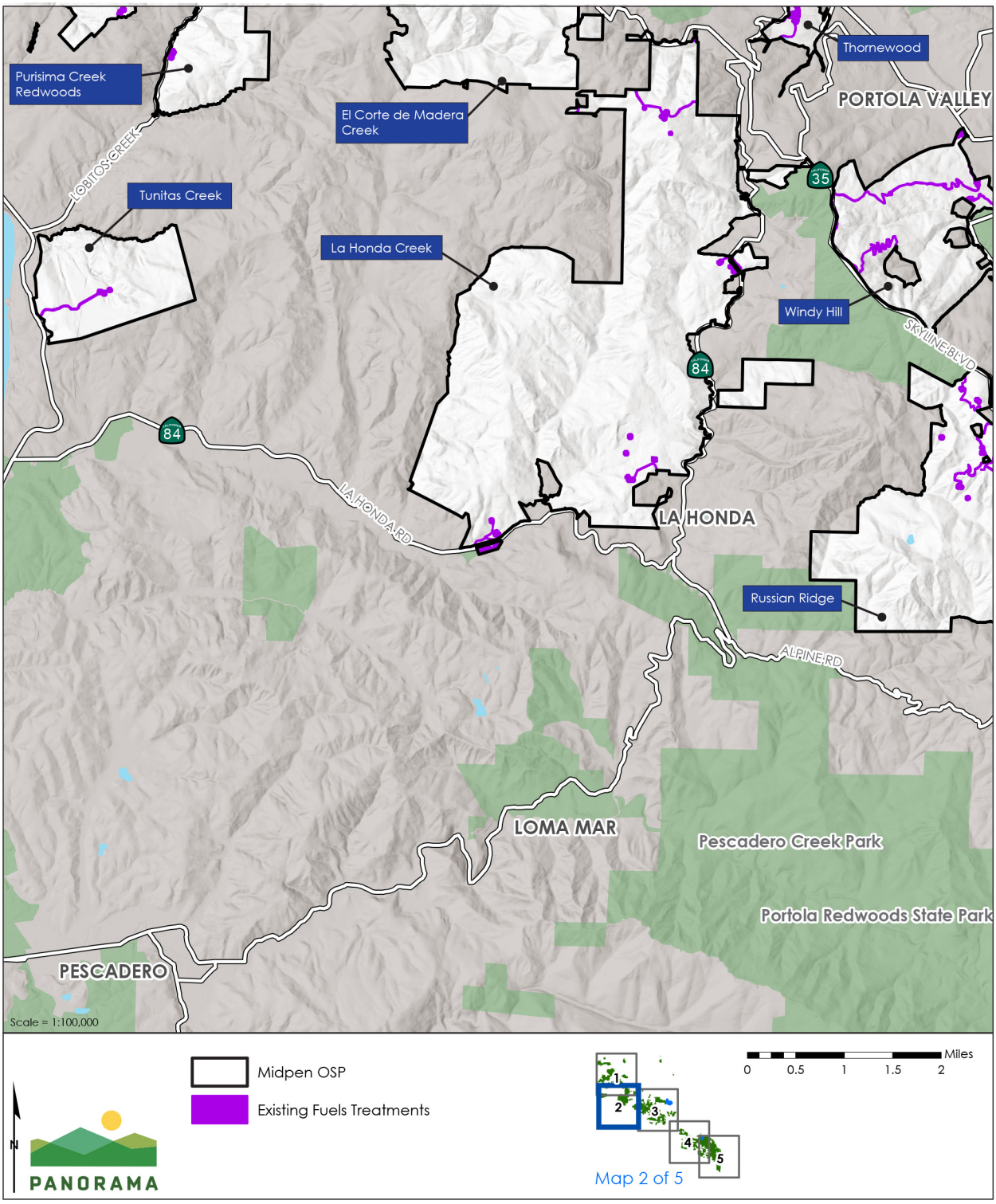
- Maintaining existing fuelbreaks in OSPs, including but not limited to fuelbreaks in Pulgas Ridge, Windy Hill, Sierra Azul, Saratoga Gap, and Monte Bello OSPs;
- Defensible space clearing around 117 Midpen-owned structures;
- Maintaining 47 landing zones;
- Maintaining hundreds of miles of fire roads; and
- Managing over 6,500 acres of grasslands using conservation grazing, in part to manage fuels.

Figure 3.3-1 Existing Treatments Within Midpen Lands (Map 1 of 5)



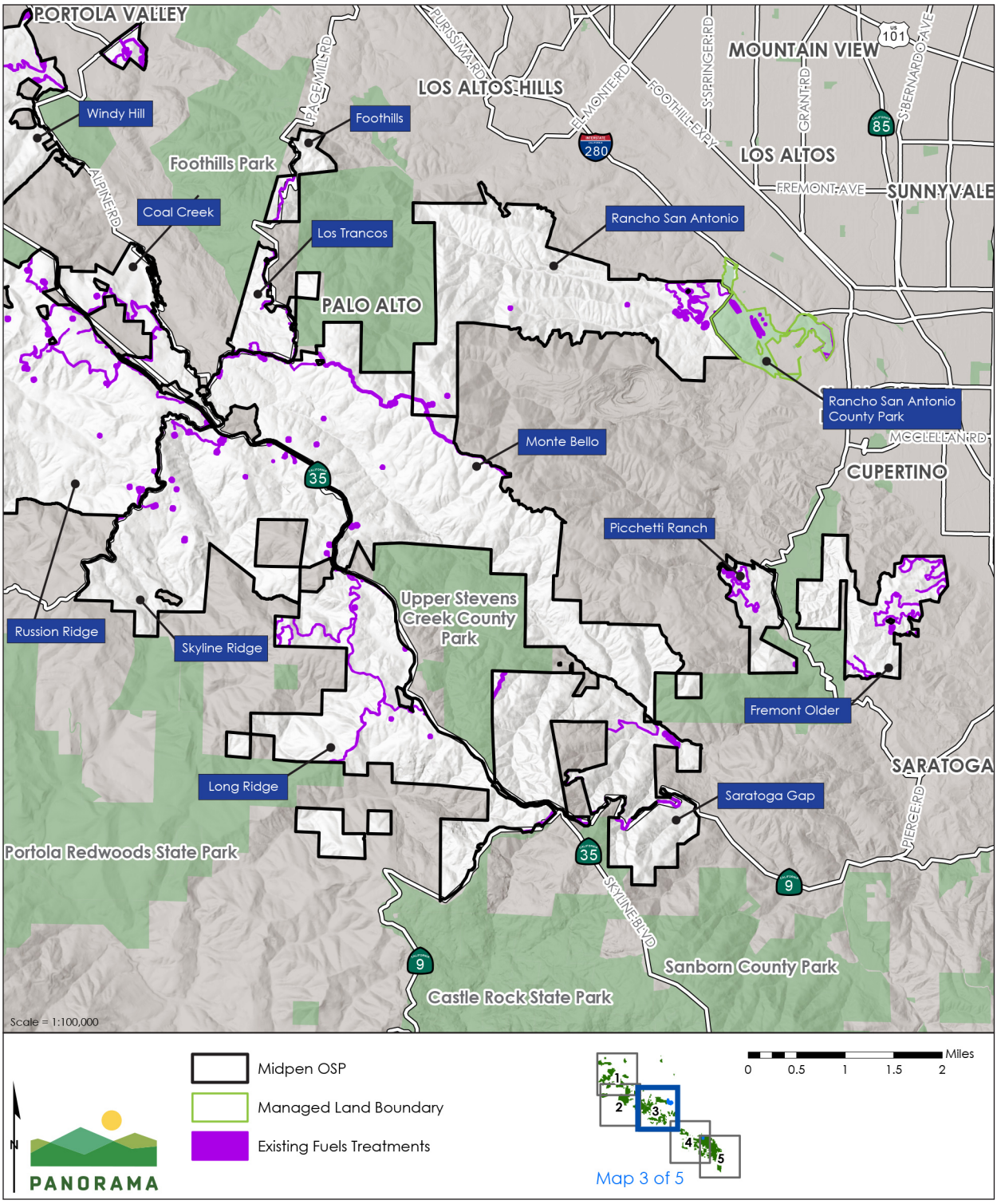
Source: (Midpen, 2019a; Midpen, 2020a; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.3-2 Existing Treatments Within Midpen Lands (Map 2 of 5)



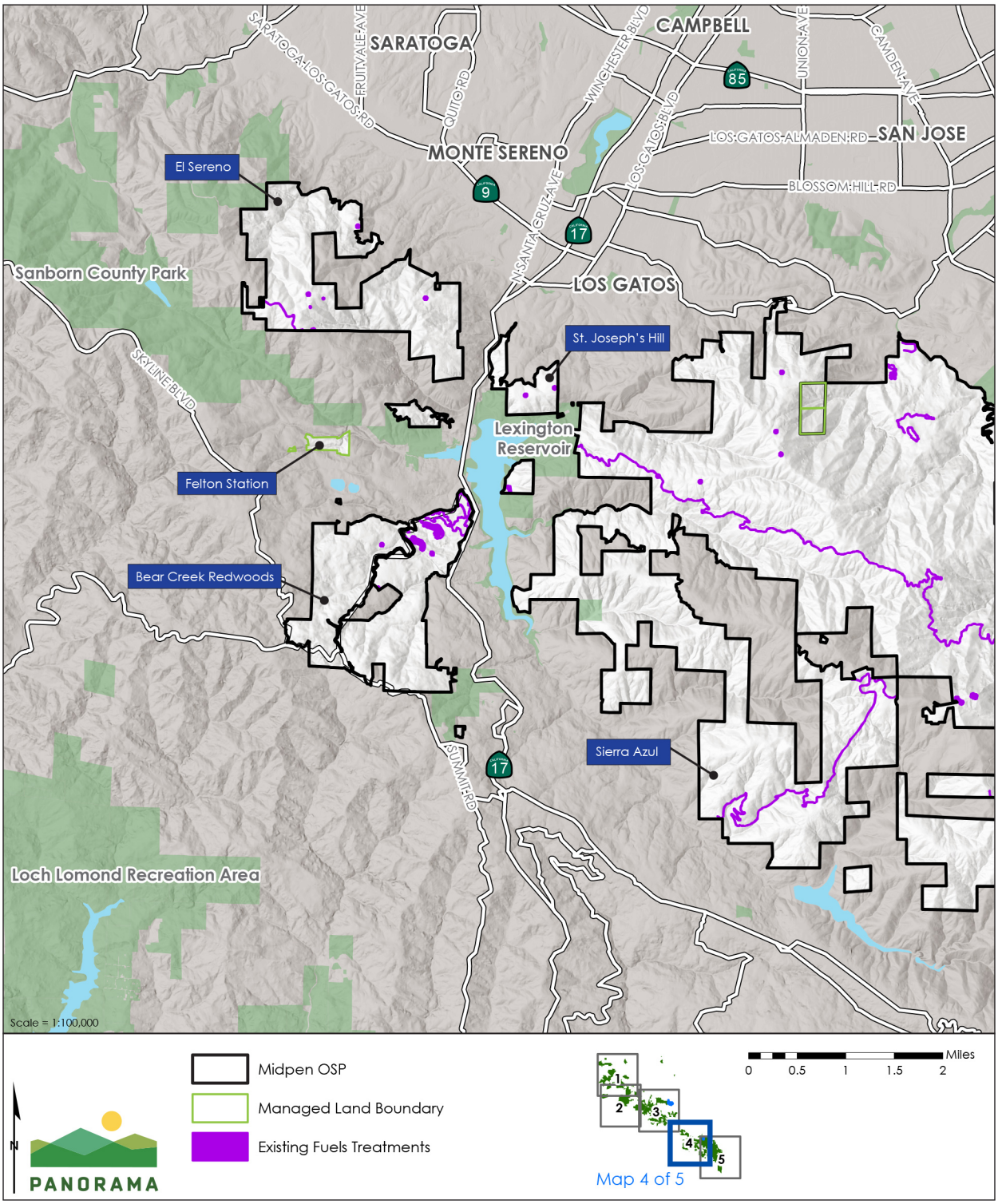
Source: (Midpen, 2019a; Midpen, 2020a; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.3-3 Existing Treatments Within Midpen Lands (Map 3 of 5)



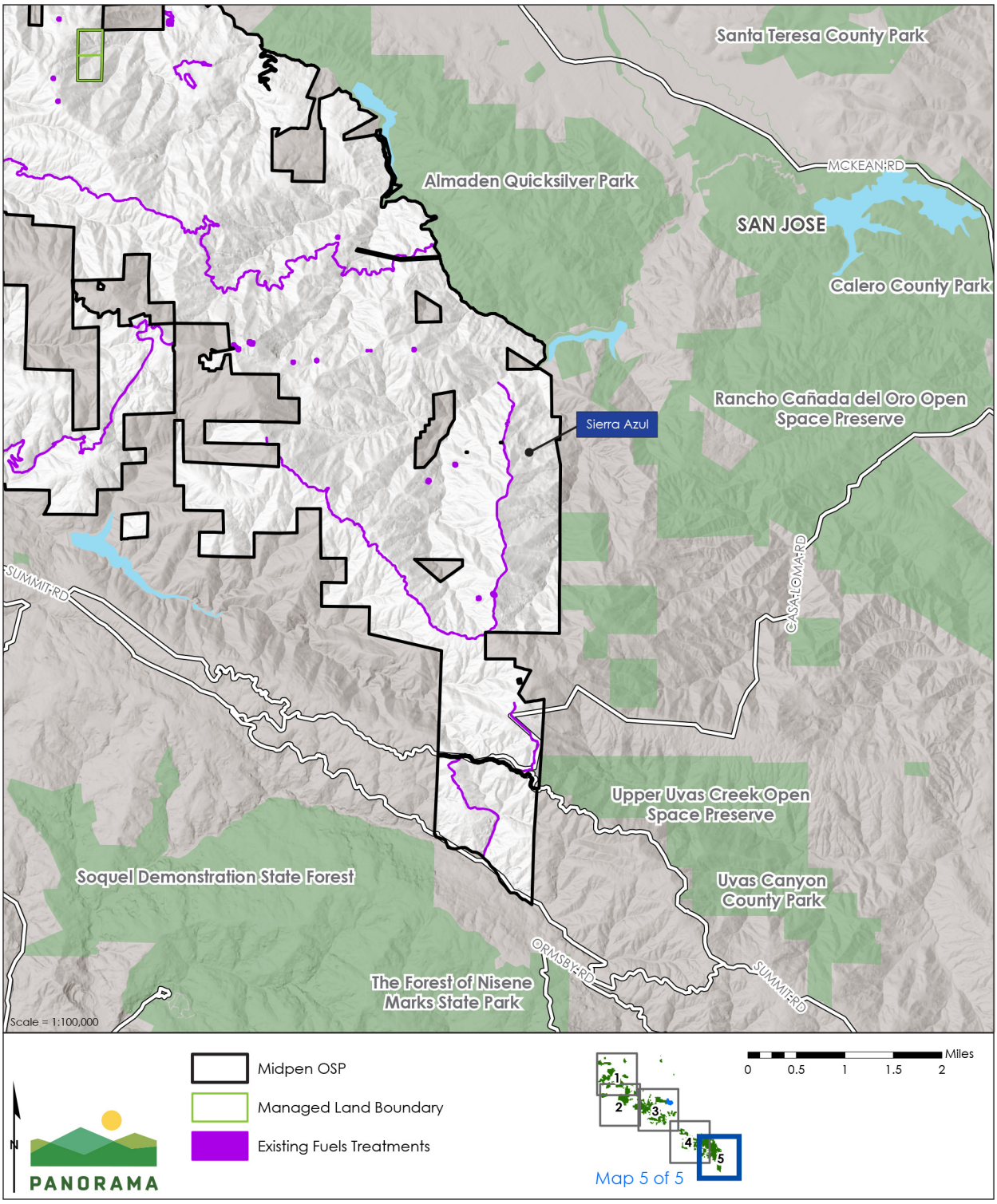
Source: (Midpen, 2019a; Midpen, 2020a; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.3-4 Existing Treatments Within Midpen Lands (Map 4 of 5)



Source: (Midpen, 2019a; Midpen, 2020a; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.3-5 Existing Treatments Within Midpen Lands (Map 5 of 5)



Source: (Midpen, 2019a; Midpen, 2020a; Bay Area Open Space Council, 2017; USGS, 2020)

3.3.2 2014 Integrated Pest Management Program

Midpen's IPMP, adopted in 2014 with an addendum certified and adopted in January 2019, prescribes pest management activities on Midpen lands covering five major categories of work, including fuel management (Midpen, 2019b; Midpen, 2014b). Vegetation management prescriptions identified in the IPMP for fire management are focused on vegetation within the WUI and around structures, which under the IPMP is considered a potential "pest" that warrants control. The prescriptions aim to control this vegetation and reduce the potential rates of spread and intensity and flame lengths of wildland fires within treated area. The IPMP specifically stated that no new major fuelbreaks or fuel management activities would be implemented and the fuel management included as part of the IPMP is not intended to replace a Fuel Management Plan. The majority of the fuel reduction work conducted under the IPMP is accomplished through mechanical means, other resources such as hand crews are also employed.

Treatments are implemented in grasslands, shrublands, forests, and agricultural land. While the IPMP allows for some degree of vegetation management for fuel reduction, it currently only covers maintenance of existing fuelbreaks and does not allow for construction of major new fuelbreaks. Table 3.3-1 provides a summary of the existing mowing, disclines, and fuels treatments on Midpen lands under the IPMP. Note that conservation grazing on Midpen lands is not included in the IPMP as it is a stand-alone program described in the following section.

3.3.3 Conservation Grazing Program

Midpen manages approximately 6,500 acres under its current Conservation Grazing Program in collaboration with small-scale, Bay Area ranchers. Midpen uses conservation grazing to manage vegetation to enhance the diversity of native plants and animals, help sustain the local agricultural economy, foster the region's rural heritage, and for fire protection. Grazing is an effective way to reduce fuel loads. Livestock eat dry vegetation across many acres, often on steep terrain that may be inaccessible to other treatment options.

Five Midpen OSPs (La Honda Creek, Russian Ridge, Purisima Creek, Skyline Ridge, and Tunitas Creek) use conservation grazing as a method of vegetation management, including wildland fuel reduction. These OSPs are along the San Mateo County Coast. Midpen leases suitable agricultural lands to tenants with expertise in managing livestock for this purpose. All leases are subject to grazing management plans to ensure that priority resource management goals are met. A map of the conservation grazing areas is shown in Figure 3.3-6.

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Table 3.3-1 Summary of Existing Treatments on Midpen Lands Under the IPMP (Acres)

Managed Land	Shaded Fuelbreaks	Non-Shaded Fuelbreaks	Ingress/Egress Route Fuelbreaks	Disclines	Defensible Space 100-foot	Defensible Space 30-foot	Fire Management Logistics Areas[a]	Grand Total
Bear Creek Redwoods OSP	1.6	1.0	--	7.0	8.1	2.8	0.8	21.2
Coal Creek OSP	16.9	0.1	--	--	1.0	0.2	--	18.2
El Corte de Madera Creek OSP	2.4	0.1	--	--	1.0	0.2	0.6	4.3
El Sereno OSP	1.5	0.2	--	--	--	--	2.2	3.9
Felton Station	--	--	--	--	--	--	--	--
Foothills OSP	2.4	--	--	0.1	--	--	--	2.5
Fremont Older OSP	--	0.1	--	14.1	2.3	0.6	1.0	18.1
La Honda Creek OSP	7.0	1.1	--	--	13.1	3.4	3.2	27.8
Long Ridge OSP	19.1	1.7	--	--	0.9	0.2	2.7	24.6
Los Trancos OSP	0.8	--	--	4.9	--	--	--	5.6
Miramontes Ridge OSP	--	1.3	--	--	1.8	0.3	--	3.4
Monte Bello OSP	28.5	0.5	--	4.4	2.9	0.6	2.8	39.6
Picchetti Ranch OSP	0.1	--	--	5.4	2.1	0.8	1.9	10.3
Pulgas Ridge OSP	--	0.1	--	--	--	--	0.7	0.8
Purisima Creek Redwoods OSP	19.8	0.5	--	--	6.8	1.9	0.3	29.3
Rancho San Antonio OSP	2.9	0.1	--	10.1	11.5	2.8	2.8	30.2
Ravenswood OSP	--	--	--	--	--	--	--	--
Russian Ridge OSP	22.5	0.3	--	5.8	10.6	2.4	3.4	45.0
Saratoga Gap OSP	17.7	4.8	--	--	1.0	0.2	--	23.7
Sierra Azul OSP	38.4	14.4	9.1	4.6	5.3	1.4	7.2	80.4
Skyline Ridge OSP	5.6	1.6	--	0.1	10.7	2.8	0.9	21.6
Saint Joseph's Hill OSP	--	--	--	--	--	--	1.4	1.4
Teague Hill OSP	7.8	--	--	--	--	--	--	7.8
Thornewood OSP	13.8	0.2	--	--	3.1	0.8	--	17.8
Tunitas Creek OSP	--	5.2	--	--	5.2	1.2	--	11.6
Windy Hill OSP	1.3	30.7	--	3.4	4.4	1.2	1.5	42.5
Other Areas Managed by Midpen	--	11.5	--	1.5	--	--	--	13.0
Grand Total	**210.0**	**75.2**	**9.1**	**61.5**	**91.8**	**23.8**	**33.3**	**504.6**

Notes:

[a] Currently maintained emergency staging areas, landing zones, and other fire management logistics areas are accounted for in this category.

Depending on habitat type, maintenance of existing treatment areas is typically completed on a 3- to 5-year rotation. Numbers may not add up to the total due to rounding.

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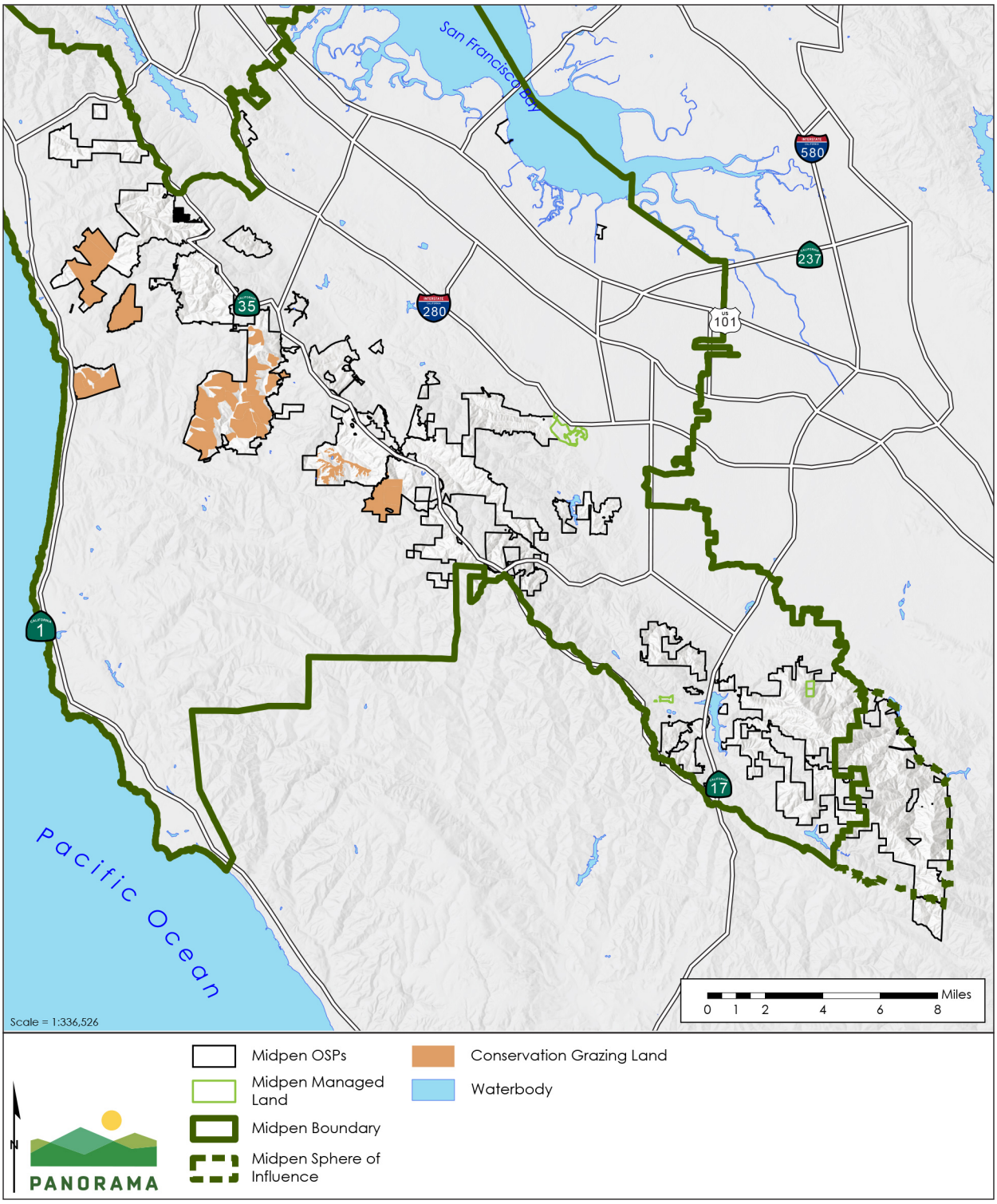
Figure 3.3-6 Conservation Grazing Program Within Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; Midpen, 2020b)

3.4 Program Purpose, Need, and Objectives

3.4.1 Program Purpose and Need

Wildland fire prevention, preparation, and response are a part of Midpen's land stewardship. California's fire season is now longer and more intense due in part to dense regrowth of historically logged forests, more than a century of fire suppression, increased development in the WUI, and a changing climate. To meet these current challenges, Midpen is expanding their environmentally sensitive vegetation management by developing this Program. Vegetation management on Midpen lands not only enhances ecological resiliency of the natural lands, it also reduces fire hazard for adjacent communities. Vegetation management activities can reduce the potential for severe wildland fire. A major wildland fire on unmanaged lands likely will have more substantial ecosystem, recreation, carbon, and resource impacts than the impacts from the work to manage the vegetation, based on impacts seen from other large wildland fires across the State in recent years.

The need for the Program is to identify the actions that would be undertaken to address the following current challenges facing Midpen and the surrounding areas:

- **Fire suppression and hazard**. The majority of land owned by Midpen is within the WUI and has a California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone rating of "High" or "Very High". Fire can spread rapidly throughout WUI areas via adjacent structures and/or vegetation, or by ember dispersion. The historic fire regime in the area at one time had greatly reduced much of the fuel load on the ground and significantly reduced the severity of fires within these fire-managed landscapes. The forest that has now grown back consists of a much higher density of trees, particularly Douglas-fir, that are more susceptible to fire. In addition, due to fire exclusion, fuels have accumulated within oak woodland, chamise, and grassland dominated vegetation types. Coupled with extensive development in the WUI, local fire risk is a critical regional issue that directly affects nearby communities through potential fire damage and evacuation orders and indirectly affects larger geographic regions through smoke and significant and prolonged air quality impacts. Increased development in the WUI also increases the potential for anthropogenic ignition sources.
- **Invasive species**. Invasive plants can alter ecosystem processes, such as reducing or changing seasonal food sources for wildlife, hydrological patterns, fire regimes, soil chemistry, or the genetic integrity of native species. Prominent non-native, invasive species found on the OSPs include French broom, jubata grass, and blue gum eucalyptus, which have the potential to increase the intensity and severity of wildland fires.
- **Climate change**. While the long-term ramifications of climate change are not fully understood, maintaining wildlands in a resilient state improves the ability of plants and animals to adapt to current and future changes (Micheli, Flint, Kennedy, Weiss, & Banciforte, 2010). Researchers are predicting decreases in the

extent of redwood forests and grasslands and increases in the extent of chamise shrublands over the next 100 years along the central coast of California. The shift may be hastened by changes in fire severity and frequency and would have implications for wildlife and biodiversity, as well as emergency response (Ackerly, et al., 2016).

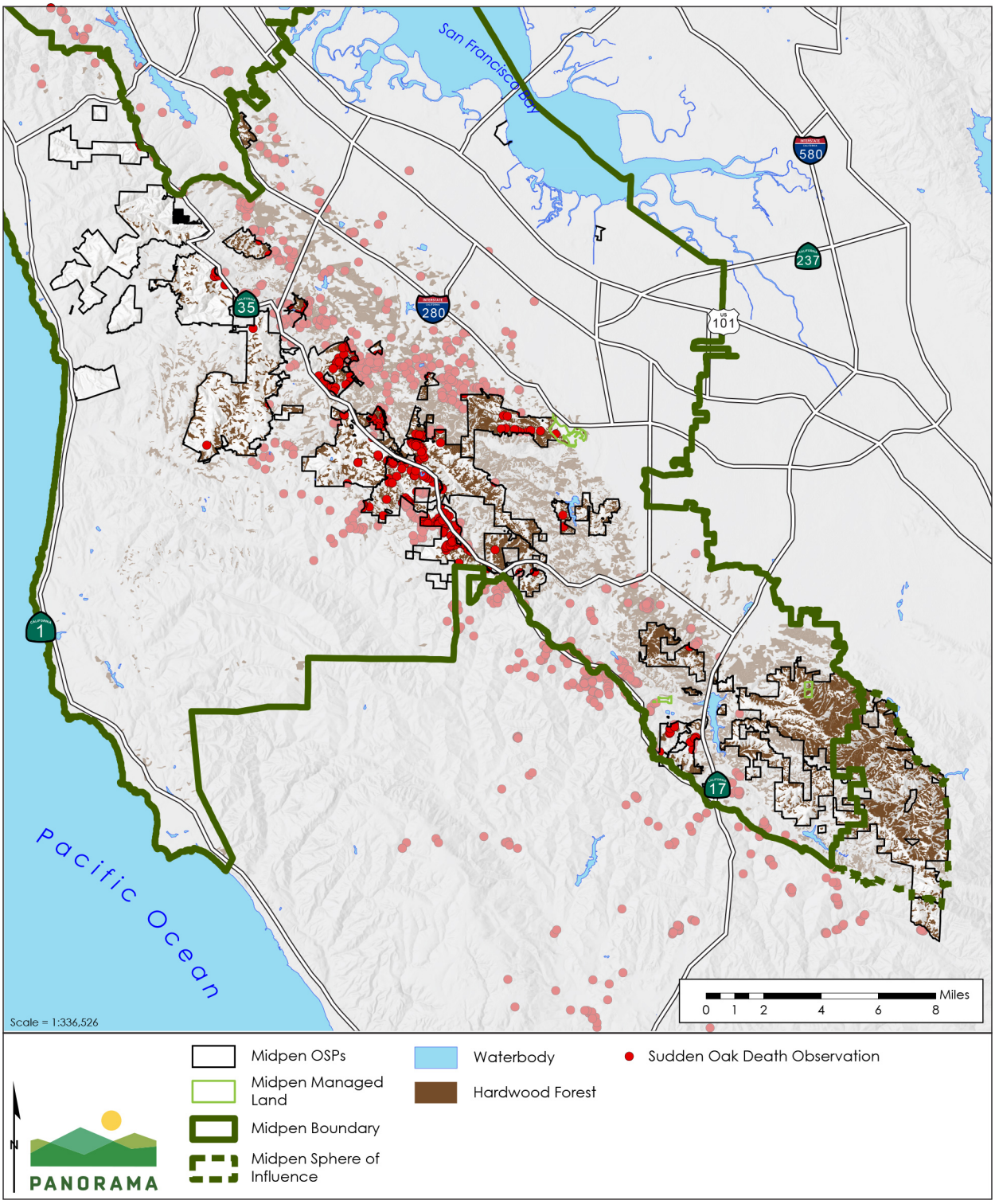
- **Sudden Oak Death (SOD)**. Sudden Oak Death (SOD) is a prevalent disease within forested lands. SOD has killed over one million native oak and tanoak trees and infests many other forest species in one Oregon and 15 coastal California counties. Hundreds of dead tanoak trees and other symptoms of the SOD pathogen, *Phytophthora ramorum*, are commonly seen on Midpen OSPs, contributing to greater fuel loads. In 2006, Midpen began its efforts to address SOD impacts by adopting a 10-year SOD plan to map oak trees on Midpen OSPs that are potentially resistant to the SOD pathogen, treat a selected number of specimen oak trees, and establish collaborative funding for SOD research to help guide land management decisions (Midpen, 2014a). SOD threatens to degrade the more than 47,000 acres of hardwood forest in the region, of which 18,000 acres occur in Midpen OSPs (refer to Figure 3.4-1). Since 2000, SOD has spread from what is believed to be its initial core in Long Ridge, Saratoga Gap, and Skyline Ridge OSPs in a northerly and easterly direction primarily as a result of weather conditions. Midpen employees continue to conduct research, monitor, and manage SOD in accordance with the IPMP.

3.4.2 Program Objectives

The objectives of the Program are as follows:

1. Manage vegetation (including invasive fire-prone trees) to establish healthy, resilient, fire-dependent or fire-adapted ecosystems, furthering Midpen's mission to protect and restore the diversity and integrity of the ecological processes on Midpen lands and facilitate healthy post-fire recovery.
2. Integrate Native American traditional ecological knowledge practices of natural resource management, particularly as they relate to prescribed fire, that promote ecological resiliency and enhance biodiversity.
3. Manage vegetation and infrastructure on Midpen lands to reduce wildland fire risks, improve wildland fire fighting capabilities and coordination, and improve overall safety to reduce the harmful effects of wildland fire on people, property, and natural resources.
4. Provide an adaptive framework for periodic review of and revisions to Midpen decisions in response to a changing climate, improved knowledge, and improved technology. This framework also considers competing Midpen priorities, capacity, funding and fiscal sustainability, and partnerships to determine the location, scale, and timing of future vegetation management activities.

Figure 3.4-1 Sudden Oak Death Observations in 2016 Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; Midpen, 2016a; Midpen, 2018a)

3.5 Description of the Program

3.5.1 Overview of Program Components

The Program would guide a comprehensive approach to vegetation management, including pre- and post-response activities to wildland fire on Midpen lands, and integrates the following four plans:

- **3.5.2 Vegetation Management Plan:** Addresses creation and maintenance of additional fuelbreaks, fuel management zones, and defensible space zones using vegetation management techniques identified in Midpen's IPMP.
- **3.5.3 Prescribed Fire Plan:** Addresses the methods and implementation of prescribed fire to manage fuel and improve ecosystem health.
- **3.5.4 Wildland Fire Pre-Plan/Resource Advisor Maps:** Describes the creation of Resource Advisor maps for each OSP and other managed land (or groups of managed lands) that include information on existing conditions, infrastructure, and resources constraints that can aid fire suppression activities and locate sensitive resource areas that merit protection from potential damage due to fire or fire suppression activities.
- **3.5.5 Monitoring Plan:** Provides a framework for recording pre-project conditions, vegetation treatment response, and fuels inventories to inform future adaptive management techniques.

The VMP and the PFP are the primary plans within the Program that could result in physical effects on the environment. The Wildland Fire Pre-Plan includes potential new infrastructure to support wildland fire response that could also result in physical effects on the environment. Each plan and the specific strategies and activities to be implemented are described in this section. The tools and techniques used to implement the strategies are then defined in detail in the following section.

3.5.2 Vegetation Management Plan

Overview

The need for vegetation management is primarily to reduce the presence of unnaturally high fuel loads and secondarily to manage vegetation near ignition sources (e.g., WUI, roads), thus reducing the intensity and harmful impacts of fires. Vegetation management may help to restore ecosystem fuel loads closer to pre-fire suppression conditions through the removal of dead and accumulated vegetation and treatment of forest disease and invasive species.

The purpose of the VMP is to define the suite of vegetation management activities that Midpen may implement to reduce the potential for and severity of ecologically-catastrophic wildland fires while also preserving biodiversity and minimizing the environmental effects. The VMP focuses on what is referred to as "non-fire" vegetation management. Only manual, mechanical, prescribed herbivory, and limited chemical methods of vegetation management are considered in this VMP. The best approach for managing fire risk and reducing fuel loads using non-fire

vegetation management methods on Midpen lands is to focus active management in areas that are affected by disease infestations and/or heavy, dense vegetation, as well as focus efforts near potential ignition sources (including along roads), and adjacent to critical infrastructure.

The VMP describes (1) treatments to enhance ecosystem resiliency, and (2) vegetation management work that facilitates fire management, reduces fire ignitions, and minimizes the intensity of wildland fires to reduce damage to ecological functions, which also serves to enhance public safety. Vegetation management on easements over Midpen lands is the responsibility of the easement holder unless there is a cost-share agreement in place. Pacific Gas and Electric (PG&E) is also responsible for their own vegetation management activities along transmission lines under the jurisdiction of the California Public Utilities Commission (CPUC) and General Order (GO) 95.

Types of Vegetation Management Areas

Overview

The Program expands Midpen's ability to create and treat new ecologically-sensitive vegetation management areas (VMAs) as resources allow. VMAs are categorized in two main ways depending upon the general goal of the treatment; ecosystem resiliency VMAs and enhanced fire management VMAs. Key types of VMAs include Fuel Reduction Areas (FRAs), fuelbreaks, and defensible space, which are described in detail below. Typical fuel treatment locations and sizes to be implemented under the VMP are summarized in Table 3.5-1. Existing treatments shown in Figure 3.3-1 through Figure 3.3-5 and described in Section 3.3 fall within the categorization of the VMAs described below.

Ecosystem Resiliency VMAs

FRAs

FRAs are the type of VMA that enhances ecosystem resiliency, which would be locations where fuels are manually or mechanically removed but not to the same extent as fuelbreaks. These areas would be less permanent than fuelbreaks and would typically be implemented in more natural areas where fuel load reduction achieves a combination of habitat enhancement goals and wildland fire risk reduction. Fuel ladders and surface fuels would be greatly reduced in FRAs, and overstory and understory vegetation would be spatially separated so that a ground fire would not, under normal fire conditions, burn too hot and/or climb into the canopy and turn into a crown fire. Examples of where FRAs could be implemented include in oak woodlands adjacent to a non-shaded fuelbreak where understory fuels are removed and over-topping conifers, such as Douglas fir, are removed, or in grasslands where shrubs are removed. FRAs can also enhance public safety when created near the WUI and/or adjacent to existing fuelbreaks.

Refugia

Prior to the creation of an FRA, a Midpen-approved biologist may designate sites within the FRA as "refugia" areas, which are areas where certain activities are prohibited, such as use of motorized equipment or artificial light. The purpose of these areas is to give wildlife a place to safely retreat to during implementation of FRA treatment.

Table 3.5-1 Typical Treatment, Sizes, and Locations

Type of Treatment	Maximum Treatment Size	Summary of Treatment Locations
Shaded Fuelbreaks	≤100-foot Fuelbreak	Along specified roads and trails, and around structures
Non-Shaded Fuelbreaks	≤60-foot Fuelbreak	Around selected meadows, grasslands, and parking lots; and along evacuation and other routes
Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	200-foot Fuelbreak [a]	Around designated evacuation routes, driveways for emergency egress, landing areas, staging areas, water tanks, communication locations, driveways for emergency egress, and sensitive resources
Target Hazards Fuelbreaks	300-foot Fuelbreak	Around schools, mobile home parks, assisted living facilities, camp sites, and community centers
Fire Agency Recommended Fuelbreaks	Variable	Near residential uses at specific locations as recommended by fire agencies
Ingress/Egress Route Fuelbreaks	≤30-foot Fuelbreaks	Around designated Wildland Type 3 fire engine routes
Disclines	Variable	Around selected meadows, grasslands, and parking lots and along evacuation and other routes
Midpen Structures and Facilities Defensible Spaces	30-foot and 100-foot Defensible Space	Around Midpen structures and facilities
Fire Management Logistics Areas[b]	200-foot Fuelbreak	Around staging areas and landing zones
Eucalyptus and Acacia Removal	Variable	Within eucalyptus and acacia groves
Fuel Reduction Areas	Variable	Within native forests or woodland areas of at least 100 acres

Notes:

[a] Includes some smaller ≤40-foot fuelbreaks around driveways.

[b] The size of existing or proposed emergency staging areas, landing zones, and other fire management logistics areas would be variable.

Enhanced Fire Management VMAs

Fuelbreaks

Overview. Enhanced fire management VMAs include various types of fuelbreaks. Fuelbreaks are linear strips of land where trees, vegetation, and dead material have been reduced or removed. These areas can slow and even stop the spread of a wildland fire because fewer fuels are present to combust. Fuelbreaks also provide firefighters with zones to take a stand against or control the spread of a wildland fire, or retreat from fire if the need arises. Fuelbreaks can reduce fire intensity and severity. Usually, fuelbreaks are strategically located considering terrain, existing roads, communities, critical infrastructure, presence of potential ignition sources, fire management logistics areas, evacuation routes, target hazards, sensitive resources, or other locations identified by fire agencies or Midpen employees as detailed by specific fuelbreak type in Table 3.5-1. Fuelbreaks vary in width. The two broad types of fuelbreak treatments are shaded and non-shaded fuelbreaks, as described below.

Shaded Fuelbreaks. A shaded fuelbreak is an area where the tree canopy is thinned to reduce the potential for a fire to move quickly through and/or to reduce fire spread into or through the canopy. Enough tall tree canopy would be retained to maintain shade, reduce the potential for rapid re-growth of shrubs and sprouting hardwoods, minimize erosion, and minimize habitat alteration. Ladder fuels and woody understory vegetation are thinned out. A shaded fuelbreak can be created manually or by using mechanical techniques (heavy equipment). Shaded fuelbreaks require follow-up maintenance along roads that includes annual mowing in grasslands adjacent to the road, clearance of brush and dead vegetation, and removal of ladder fuels to the canopy in forested areas. Herbicides may also be sparingly applied to control resprouting species.

Widths of fuelbreaks would vary depending on the presence of sensitive resources, the location of habitat transitions, slope, expected fire behavior, the features or infrastructure that need protection, and the capacity to create and maintain the fuelbreak (refer to Table 3.5-1 for a description of the types of fuelbreaks and maximum widths).

Non-Shaded Fuelbreaks. A non-shaded fuelbreak is a swath of land where fuels are reduced in areas without a tree canopy, typically at a change in vegetation type, such as from forest or shrubland into grassland, or within grasslands. Heavy equipment is used for construction, except on steep slopes, where manual treatments are employed. Non-shaded fuelbreaks are often implemented near structures where professional fire agency personnel deem they are critical for fire safety or necessary to meet defensible space requirements. Herbicides may also be sparingly applied in non-shaded fuelbreaks to control invasive plants.

Ingress/Egress Route Fuelbreaks. An ingress/egress fuelbreak is a zone located on both sides of roads identified as critical for emergency vehicle passage, usually designed to accommodate a smaller Wildland Type 3 fire engine. Vegetation management in this zone improves access and reduces radiant heat during a wildland fire, allowing improved firefighter access. These fuelbreaks are typically cleared of all understory vegetation for 10 to 30 feet from road edges

(on either side), using primarily manual and mechanical techniques initially, and then mowed annually.

Disclines

Disclines are a type of vegetation treatment that is conducted using a tractor attachment with a series of metal discs to disturb soil 6 to 12 inches deep. By turning over the soil and leaving mostly a dirt surface, a discline is intended to slow or stop fire progression. Midpen employees have previously documented disclines stopping ignitions on Midpen lands. A discline is typically placed along the perimeter of undeveloped land, ranches, and roadways. Herbicides may be sparingly applied to control invasive species. To avoid or reduce potential impacts to ground-dwelling species and surface erosion, disclines would only be installed in limited locations after a thorough evaluation of benefits and consequences.

Defensible Space

Defensible space is the area immediately surrounding a structure where vegetation management measures to reduce fuels are implemented, providing the key point of defense from an approaching wildland fire, or defense against escaping structure fires. Fuel loads are reduced within 100 feet of structures. The 100 feet of defensible space is subdivided into three zones. Zone 0 involves removal of all vegetation within 5 feet of structures, typically by hand or small equipment, and allows only non-flammable hardscaping or similar techniques. Zone 1 involves removal of all dead matter and dense fuels within 30 feet of buildings, decks, and other structures using primarily manual and mechanical techniques. Zone 2 involves mowing, removal of ladder fuels, and thinning of vegetation extending from 30 to 100 feet out from buildings and structures (California Government Code 51182 and PRC Sections 4290 and 4291).

Under the VMP, maintenance of defensible space would continue to occur on an annual basis around an estimated 117 Midpen-owned structures. The work would be performed by Midpen employees and/or by residential, commercial or agricultural/rangeland tenants. Defensible space around private property, including private homes located adjacent to Midpen lands, is the responsibility of the person or entity that owns, leases, controls, operates, or maintains the building or structure. Midpen works with communities, fire safe councils, and local fire agencies who wish to perform fuel reduction on Midpen lands to permit ecologically sensitive work by other parties.

Fire Management Logistics Areas

Emergency fire management logistics areas, such as emergency staging areas and landing zones, are key during a wildland fire where fire suppression resources may safely park, gather crews, or land a helicopter. Fire management locations may also serve as a temporary refuge area during a wildland fire. Landing zones allow helicopters to land in the event of an emergency. These areas would continue to be maintained annually or bi-annually via mowing with a tractor or brushcutter at 47 locations on Midpen lands. A 200-foot-wide fuelbreak around these logistics areas would be constructed or existing fuelbreaks expanded out to 200 feet using the methods described above.

Eucalyptus and Acacia Removal

Fallen eucalyptus leaves create dense carpets of flammable material, and the tree bark peels off in long streamers that drop to the ground. The debris from eucalyptus provide large amounts of fuel that draws ground fires up into the leaves, creating massive, fast-spreading "crown fires" in the upper story of eucalyptus forests. The leaves from some species of acacia contain resin and flammable oils, which can encourage fires. Eucalyptus and acacia trees may be removed from locations where they could pose a fire hazard. The potential areas within which removal could occur are shown in Figure 3.5-1. Approximately 200 acres of eucalyptus are mapped in the Program area; however, not all eucalyptus have been mapped so the total acreage is greater. These trees are removed using manual and mechanical methods. Limited herbicides may be applied to control re-sprouting from cut stumps. Replanting of native trees and vegetation would be conducted as appropriate with consideration for the type of vegetation community that should be in the area. Advisement from fire agencies in regards to fuel loads would also be considered prior to replanting.

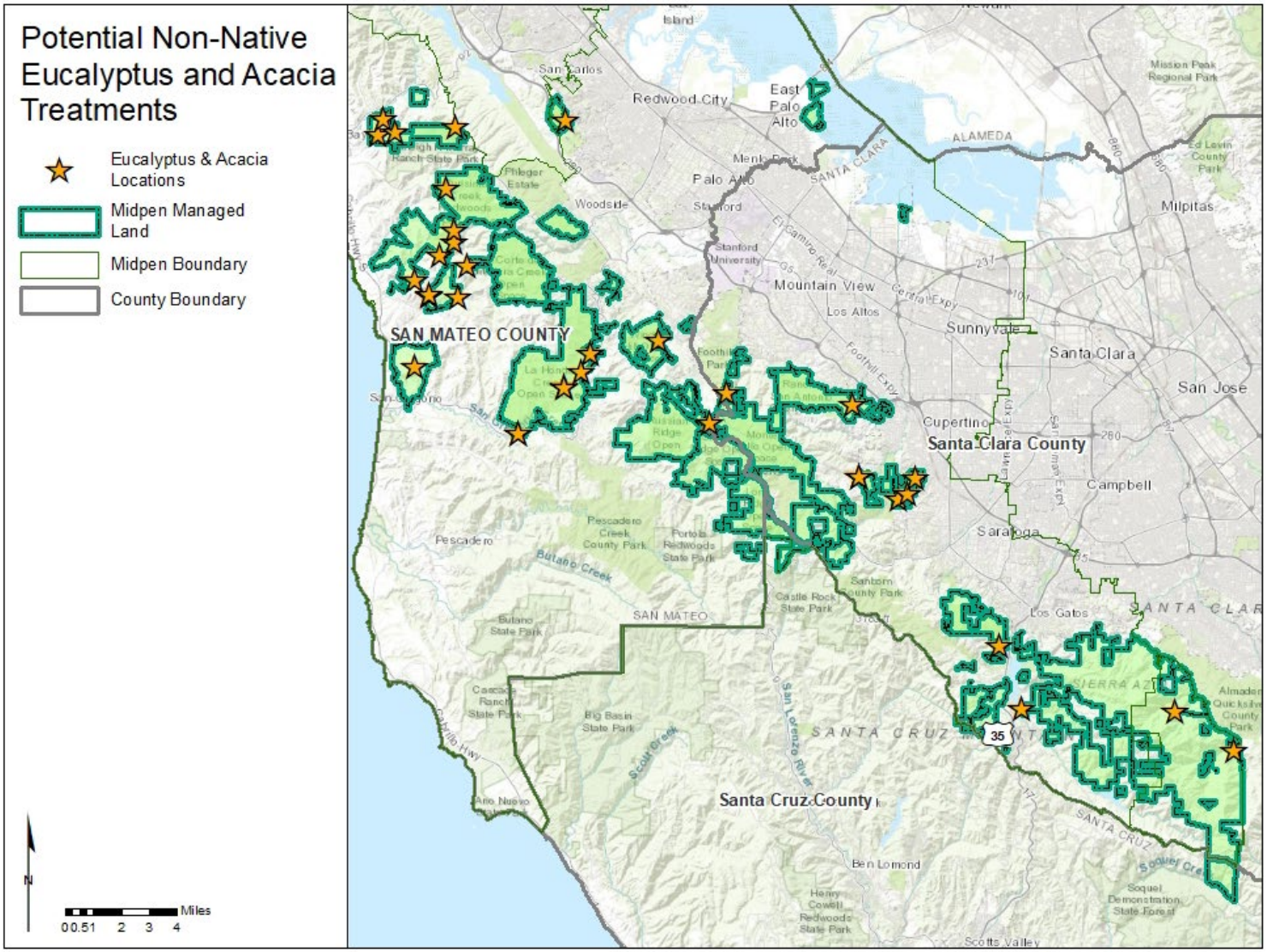
Riparian Habitat within Enhanced Fire Management VMAs

Any enhanced fire management VMAs that fall within or cross riparian areas would be modified such that the vegetation treatments performed would be limited to FRA-level management. A Midpen-approved or professional biologist would evaluate any areas where enhanced fire management VMAs (e.g., fuelbreaks) cross into riparian habitat and design the treatments to avoid loss of riparian habitat function and retain or improve habitat functions. Considerations could include, but are not limited to:

- Retain at least 75 percent of the overstory and 50 percent of the understory canopy of native riparian vegetation within the limits of riparian habitat. Retain native riparian vegetation in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of treatment activities.
- Limit treatments to removal of uncharacteristic fuel loads (e.g., removing dead or dying vegetation), trimming/limbing of woody species as necessary to reduce ladder fuels, and select thinning of vegetation to restore densities that are characteristic of healthy stands of the riparian vegetation types.
- Avoid removal of large, native riparian hardwood trees.
- Trees to be removed will be directed away from adjacent streams or waterbodies when cut and piled outside of the riparian vegetation zone (unless there is an ecological reason to do otherwise that is approved by applicable regulatory agencies, such as adding large woody material to a stream to enhance fish habitat)
- Avoid vegetation removal that could reduce stream shading and increase stream temperatures.

Typically, work in riparian corridors would be conducted by hand methods. Limited equipment may be used in cases where it would cause less disruption and/or is needed to achieve habitat and fire management objectives.

Figure 3.5-1 Potential Locations Where Eucalyptus and Acacia Removal Could Occur



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a)

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Creation of New VMAs

Areas Within which New VMAs Could be Defined

The potential areas within which new VMAs could be established in the future under the Program are identified in Figure 3.5-2 through Figure 3.5-6 (refer to Appendix 3.0-1 for detailed maps showing potential treatment areas). The areas shown are meant to represent the "envelope" within which the VMAs can be created. The actual acreages and areas of VMAs created are likely to be less than the full envelope shown.

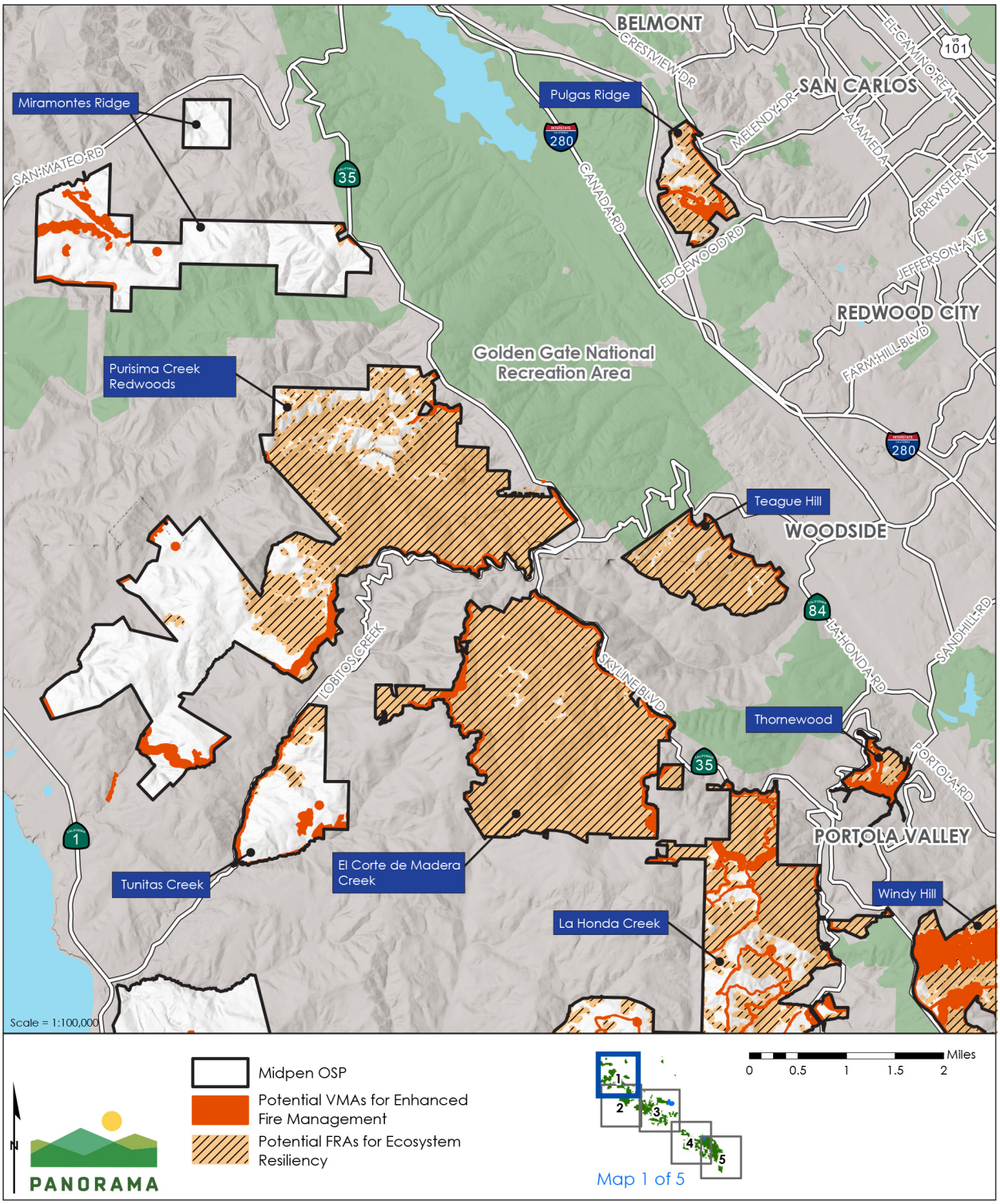
Several criteria are used to determine this "envelope" of potential VMA locations, as presented in the Program, Section 4.4.3: Method of Prioritizing the Establishment of New VMAs. New FRAs (i.e., ecosystem resiliency VMAs) could be created within native forests or woodland areas of at least 100 acres in size. Criteria considered to develop the envelope of potential enhanced fire management VMAs (e.g., fuelbreaks) include whether fuel treatments would facilitate fire suppression activities and ingress/egress safety for fire responding agencies, their personnel, and fire suppression equipment. Other criteria include whether the area is adjacent to or near existing or planned fuel treatment areas as identified by fire agencies. Fuel treatments within up to 300 feet of important structures (i.e., school, hospital, nursing home) are also important.

Prioritization of New VMA Creation

Vegetation management techniques to create new VMAs involve reducing the density of vegetation and strategically opening areas to reduce fire spread and improve fire management and response. Creation of VMAs (including FRAs) each year would be prioritized in accordance with detailed ranking methods, as presented in the Program, Section 4.4.3: Method of Prioritizing the Establishment of New VMAs. Prioritization of VMAs is established by assigning points for those specific factors detailed in the Program. The areas with the most points receive the highest priority ranking (e.g., Tier 1). VMAs to be treated each year would be identified through a prioritization process and defined in an Annual Work Plan. Midpen's ability to adequately maintain VMAs over the long-term is also factored into the decision-making process for where to create new VMAs. The initial highest priority VMAs, in accordance with the prioritization criteria, are summarized in Table 3.5-2.

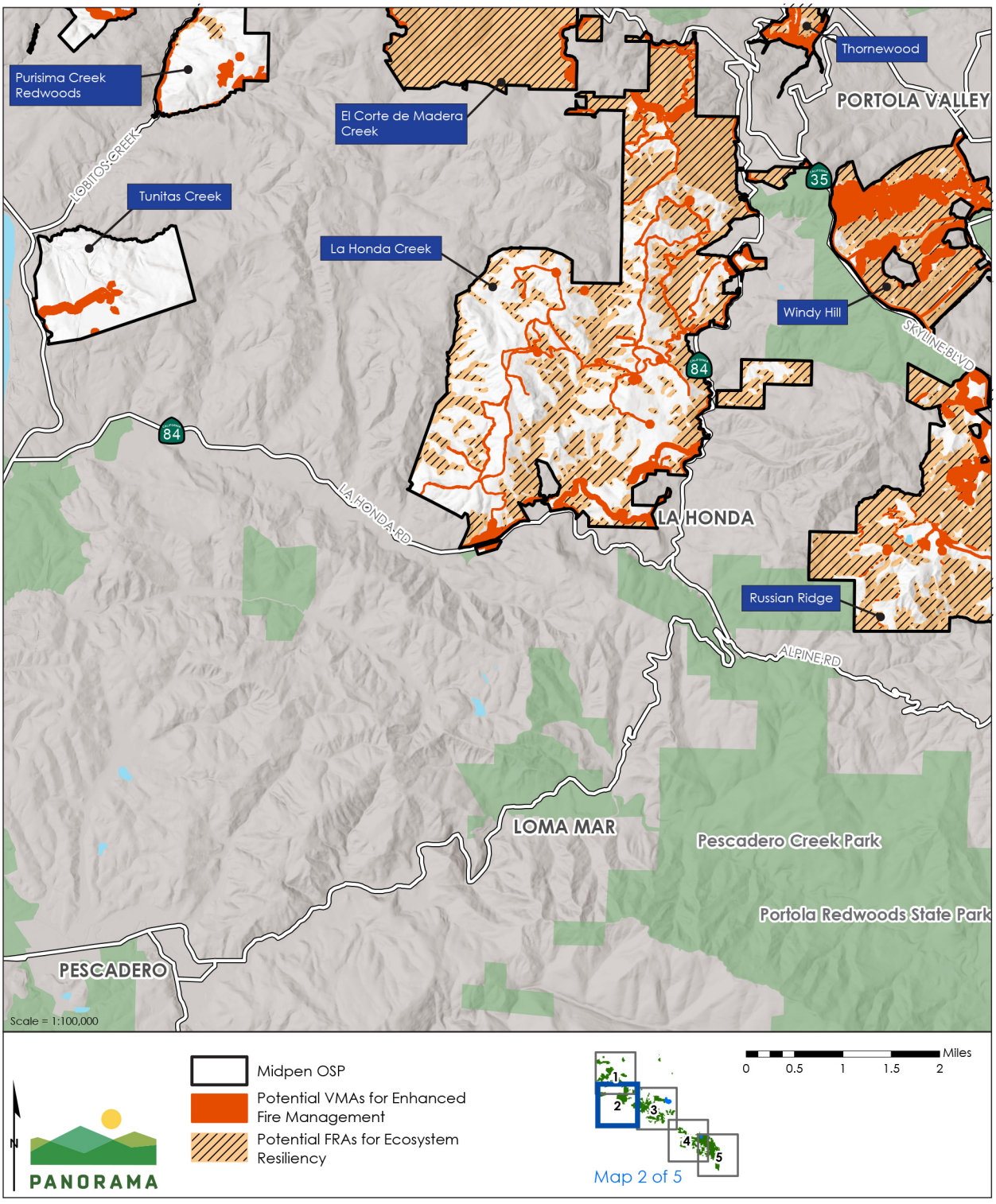
With new land acquisitions and/or changing environmental, operational, and other factors, annual priorities may change. Midpen anticipates targeting as many of the higher priority VMAs as soon as possible, but dependent on available resources. Tier 1 and Tier 2 VMAs would be prioritized for creation first. Contiguous lower prioritized VMAs may be created simultaneously with Tier 1 and Tier 2 VMAs for efficiency.

Figure 3.5-2 Potential Areas Within which New VMAs Could be Established (Map 1 of 5)



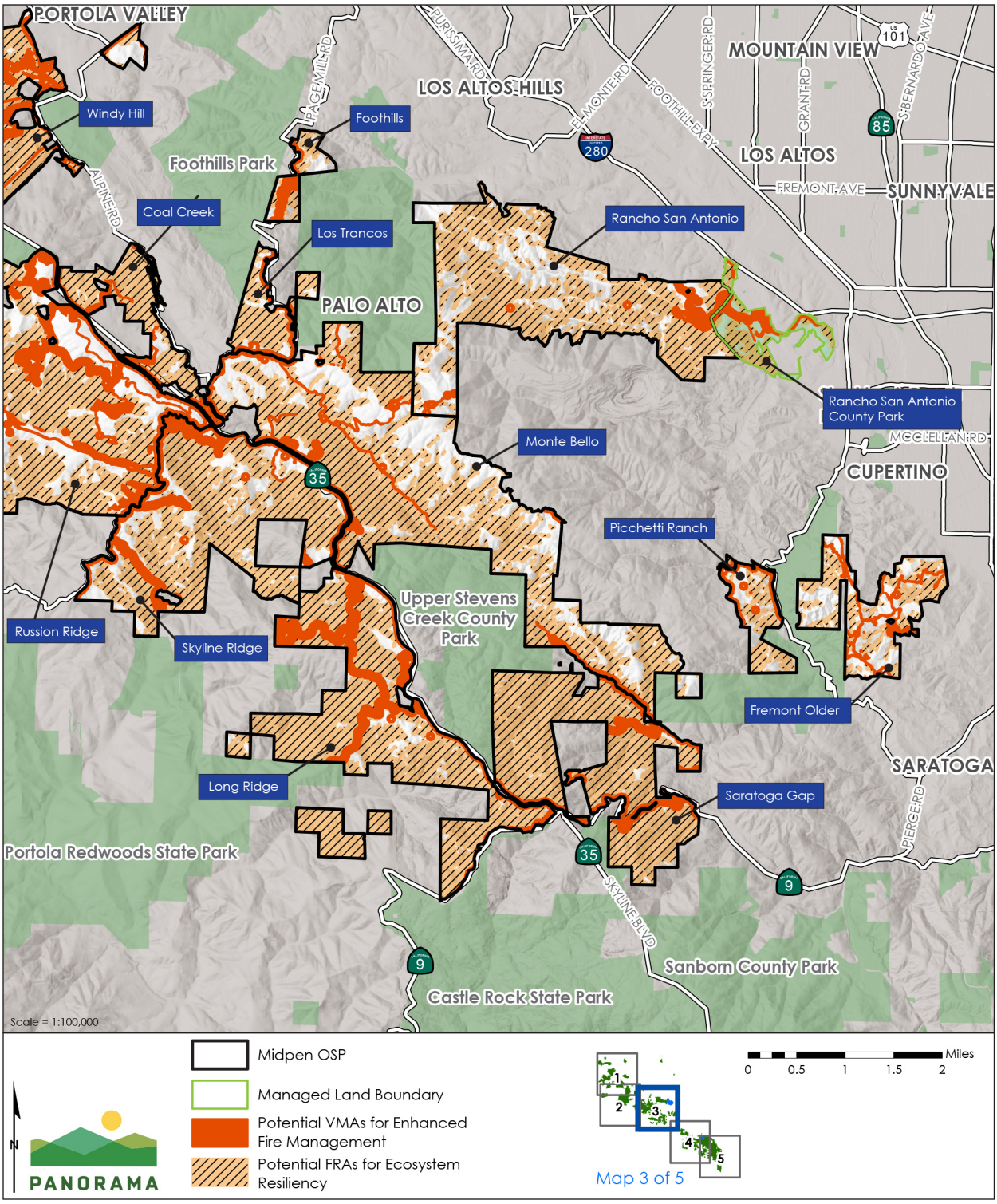
Source: (Midpen, 2019a; Midpen, 2020c; Midpen, 2020d; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.5-3 Potential Areas Within which New VMAs Could be Established (Map 2 of 5)



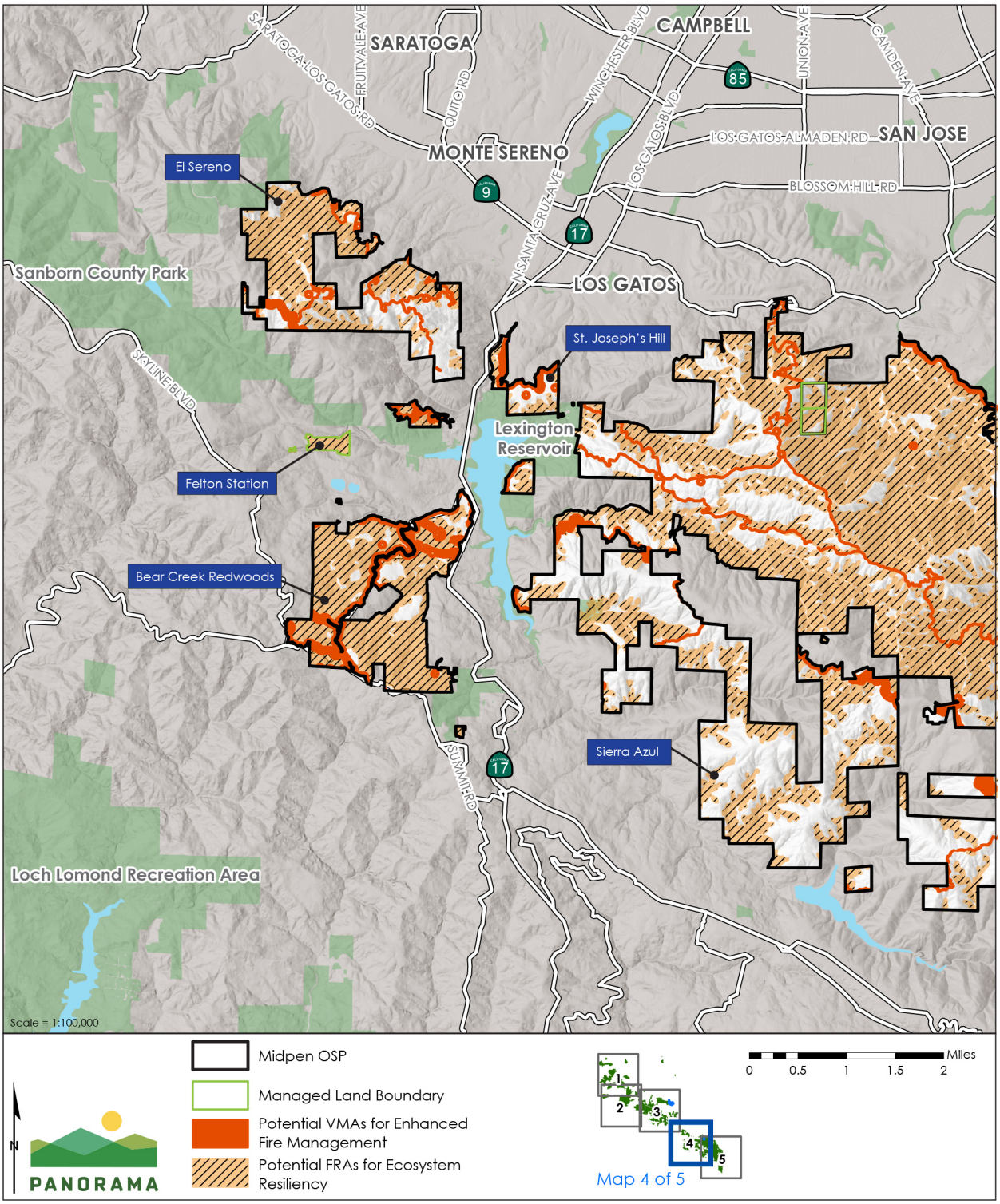
Source: (Midpen, 2019a; Midpen, 2020c; Midpen, 2020d; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.5-4 Potential Areas Within which New VMAs Could be Established (Map 3 of 5)



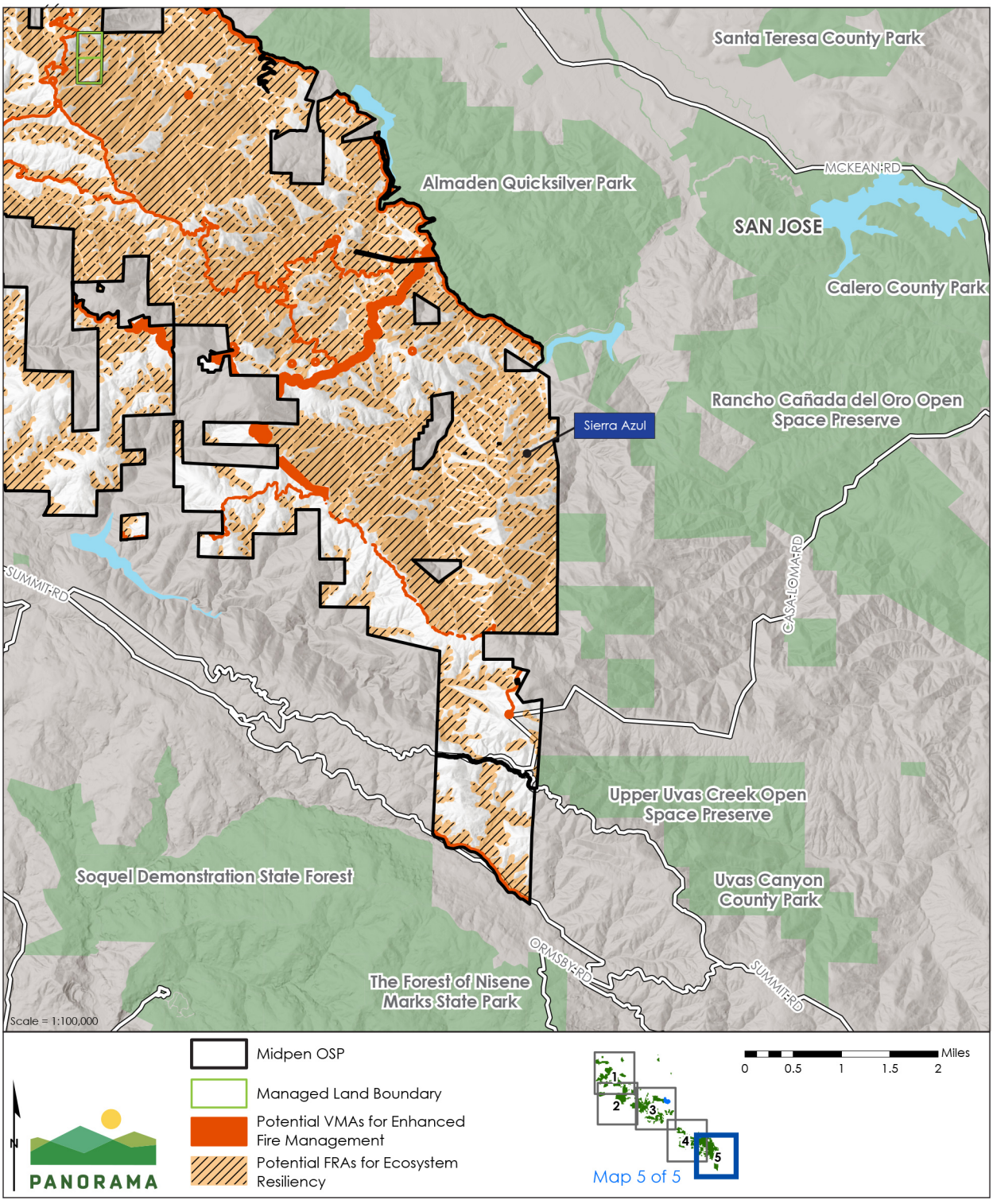
Source: (Midpen, 2019a; Midpen, 2020c; Midpen, 2020d; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.5-5 Potential Areas Within which New VMAs Could be Established (Map 4 of 5)



Source: (Midpen, 2019a; Midpen, 2020c; Midpen, 2020d; Bay Area Open Space Council, 2017; USGS, 2020)

Figure 3.5-6 Potential Areas Within which New VMAs Could be Established (Map 5 of 5)



Source: (Midpen, 2019a; Midpen, 2020c; Midpen, 2020d; Bay Area Open Space Council, 2017; USGS, 2020)

New VMA Creation Methods

Generally, vegetation management methods implemented to create new VMAs involve reducing the density of vegetation and strategically opening areas to reduce spread and improve fire management and response. At key locations, shrubs, small trees, and grass that can act as fuel ladders, allowing a surface wildland fire to travel up into the tree canopy, can be removed or reduced in density. Grasses can be mowed or grazed to manage fuel loads. Small trees and shrubs can be thinned, leaving larger diameter trees with often thick fire-resistant bark and promoting late-seral forests.

Table 3.5-2 Priority VMAs on Midpen Lands (Acres) – Excludes Ecosystem Resiliency FRAs

Managed Land	Tier 1	Tier 2
Bear Creek Redwoods OSP	23.4	37.5
Coal Creek OSP	38.5	21.7
El Corte de Madera Creek OSP	0.8	9.1
El Sereno OSP	1.3	5.4
Felton Station	--	--
Foothills OSP	--	0.3
Fremont Older OSP	--	0.8
La Honda Creek OSP	19.5	23.9
Long Ridge OSP	114.1	96.7
Los Trancos OSP	--	3.7
Miramontes Ridge OSP	0.3	0.4
Monte Bello OSP	25.1	36.9
Picchetti Ranch OSP	--	0.8
Pulgas Ridge OSP	0.2	6.8
Purisima Creek Redwoods OSP	2.9	76.4
Rancho San Antonio OSP	0.4	14.8
Ravenswood OSP	--	--
Russian Ridge OSP	74.3	38.8
Saratoga Gap OSP	0.5	2.2
Sierra Azul OSP	0.9	38.5
Skyline Ridge OSP	49.3	50.5
St. Joseph's Hill OSP	--	0.3
Stevens Creek Shoreline Nature Study Area	--	--

Managed Land	Tier 1	Tier 2
Teague Hill OSP	18.6	4.1
Thornewood OSP	43.8	4.2
Tunitas Creek OSP	--	0.4
Windy Hill OSP	98.8	50.1
Other Areas Managed by Midpen	1.5	6.8

Notes:
Numbers may not add up to the total due to rounding.
Tier 1 and Tier 2 refer to the highest importance VMAs that should be created first.

Cyclical Maintenance of VMAs

Vegetation management would be performed periodically to keep VMAs (e.g., FRAs, fuelbreaks, and defensible space) functional over time. Maintenance of existing VMAs (shown in Figure 3.3-1 through Figure 3.3-5) and new VMAs would occur under the Program. The maintenance requirements of the VMAs (are related to the structure and composition of the vegetation retained within and surrounding it. VMAs with large numbers of perennial, fast-growing weeds in or adjacent to them require more frequent maintenance than those without. VMAs that border or traverse largely intact ecosystems still dominated by native species can be maintained with low-intensity brushing, performed as needed based on field inspections. VMAs that are bordered or traversed by degraded ecosystems dominated by weeds need a different and more intensive maintenance prescription to reduce the spread of weeds in the VMA and into surrounding areas.

The time between treatments depends on how fast the vegetation in the fuelbreak grows, if invasive species colonize the disturbed area (Midpen, 2014b; Midpen, 2019b), the likelihood of an ignition and fire spread, and/or the proximity to buildings and other high value assets. VMAs that aid fire management typically involve periodic maintenance to operate as intended. If not regularly maintained, the level of effort and cost required to re-establish the desired conditions of the VMA begins to approach the same level as new construction. FRAs are maintained as needed.

Cyclical maintenance would be performed using combinations of different treatment techniques to ensure that the maintenance work is efficient and performed in a timely manner while minimizing ecological impacts. Techniques include a combination of cutting with heavy equipment, mowing, and/or use of hand tools, as well as on-site mastication, mulching, and pile burning. Some chemical methods may also be used in very limited circumstances. Midpen would adopt specific strategies to perform maintenance of VMAs within their lands and would communicate with adjacent landowners or land managers to maintain effective management of fuelbreaks along the perimeter of OSPs.

Vegetation Management Treatment Methods

Vegetation Management Toolbox

Vegetation would be managed primarily manually, mechanically, with prescribed herbivory (using goats, sheep, or other livestock to reduce fuels in a specific area), and to a significantly limited extent, herbicides. Invasive species are prioritized over removal of native species. Table 3.5-3 identifies the treatment actions and estimated maximum annual application of each vegetation management treatment under the VMP. Specific vegetation management treatments are determined by Midpen employees who take into consideration location of treatment, the biology of the plant species being treated, availability of resources, and/or presence of non-target species.

Table 3.5-3 VMA Treatment Methods and Estimated Maximum Annual Application

Treatment Type	Treatment Method	Typical Method of Application	Purpose	Maximum Annual Application
Manual and Mechanical	Mowing and Cutting	Tractor, brushcutter, chainsaw, skid steer with mounted head, jawz implement, pole pruner	Removal of vegetation for VMA treatment	See Table 3.6-1
	Discing and Cutting	Tractor, pole pruner	Discline creation	
	Masticating	Skid steer, tractor	Removal of vegetation for VMA treatment	
	Pulling	Backhoe, excavator	Removal of vegetation for VMA treatment, hazard tree removal	
	Chipping	Chipper	Biomass disposal	
	Pile Burn	Water truck, leaf blower, drip torch	Biomass disposal	
Mechanical	Flaming	Propane torch	Invasive non-native species treatment in VMAs	
	Mowing	Tractor, skid steer with mounted head, brushcutter	Invasive species treatment in VMAs	
Chemical Application	Glyphosate Round-up Promax	Cut-stump	Invasive species or SOD removal in VMAs; Removal of vegetation for VMA treatment	2 gallons concentrate
		Spot spray	Treatment of defensible space	5 gallons concentrate

Treatment Type	Treatment Method	Typical Method of Application	Purpose	Maximum Annual Application
	Clethodim, Aminopyralid, and Clopyralid	Spot spray	Invasive plant control in VMAs	2 gallons concentrate per chemical type
	Imazapyr	Spot spray	Invasive plant control in VMAs	0.5 gallons concentrate
		Cut-stump	Invasive plant control/SOD in VMAs	0.25 gallons of concentrate
	Triclopyr BEE/TEA	Cut-stump	Invasive species or SOD removal in VMAs; Removal of vegetation for VMA treatment	5 gallons of concentrate
		Spot Spray	Invasive species in VMAs or treatment of defensible space	10 gallons of concentrate
Prescribed herbivory	Livestock	Livestock foraging	Pre-treatment of VMAs	100 acres

Treatment Types and Methods

Manual

Manual methods would involve use of power and non-powered hand tools. Vegetation management tasks would include lopping, pruning, and girdling trees or large single-stem shrubs. Loppers, hand pruners, hand saws, hatchets, pulaskis, machetes, brush hooks, and brush axes may be used to manually remove vegetation. Powered hand tools would also be used, including brushcutters (metal blade), string trimmers (monofilament plastic line), and chainsaws, and may also include power pole saws and hedge trimmers. Ground crews with brushcutters and chainsaws would work where heavy equipment cannot reach, generally more than 30 feet from a road edge and on slopes exceeding 30 percent. Chainsaws would be used to limb or remove individual trees or shrubs. Brushcutters would be used where stem diameters are less than 5 inches at cut level or where the vegetation is predominately herbaceous. Cutting of herbaceous vegetation, including grasses and very young seedlings, would be performed with string trimmers.

Mechanical

Mowing and brushcutting are the primary methods of mechanical vegetation treatment. Motorized heavy machinery would be mounted with various mowing, mulching, chipping, and masticating heads for larger scale vegetation removal projects and cyclical maintenance tasks. Heavy, renewable diesel-powered equipment includes excavators, backhoes, skid-steers, and tracked chippers, and tractors. Equipment operates both on-road and off-road. Any equipment used off-road is normally track-mounted to minimize soil disturbance and compaction. The mowing or grinding heads and chippers reduce material to a size that does not require pile

burning. Articulating arms are used to extend reach both outward and up so equipment can primarily stay on existing roads. A backhoe or excavator may push or pull down individual small trees (typically less than 8 inches diameter at breast height [DBH]) either with the arm or with a cable or chain attached to the arm. Grass would usually be mowed with tractors.

Heavy equipment is transported to an access point along an existing service road. Use of traditional heavy equipment is generally restricted to sites with 30 percent slopes or less and unsaturated soils. Special equipment may be able to work on slopes up to 60 percent. To maintain public safety, road guards, signage, and temporary closures are used when equipment operates in close proximity to recreational roads and trails.

Green flaming (propane flaming) would also be used during VMA creation to address broom and other invasive non-native species seedlings. Flaming is usually conducted during light rains or on wet days when forest litter or grassland thatch is not likely to catch fire. Additional precautions are implemented at the time of use, including bringing truck-mounted or backpack water tanks, and operating with more than one person on site.

Biomass disposal can be conducted through several methods. A masticator would be used primarily for fuelbreaks, but also sometimes for brushing around structures, roads, parking lots and brush removal in grasslands. Masticators leave behind mulch and pieces of shattered wood. A chipper would be used to reduce branches and other woody material to chips and dispersed on site in brush or forest covered areas. Chips may also be hauled off-site and utilized as ground cover or erosion control in other areas. Midpen may set up permanent composting sites for stock piling of chipped material. These sites would be located at or near field offices. Compost may be used at other project sites to amend soils and chips used as mulch. Pile burning is another method of biomass disposal that would use mechanical methods and fire to eliminate piles of dried plant material. Piles would be created in concert with brush or weed removal and placed in openings, away from power lines, and tree canopies to allow for safe ignition at a later date. Under the VMP, the total volume of material burned in piles in a year would not exceed 500 tons. Pile burning would occur between November and May under the direction of Midpen employees on days when weather conditions meet the specifications of the Bay Area Air Quality Management District (BAAQMD) permit. Multiple piles may be burned on a single day. Prior to burning, a biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if wildlife are unlikely to be present. Drip torches or other approved ignition devices are used to start pile ignitions, with fuel use limited to 10 gallons or less per day. Midpen employees would remain on-site with fire suppression equipment, including a water supply (e.g., tender), to ensure safety and to extinguish embers by each workday's end.

Chemical Application

Limited chemical control (herbicide) would be used for stump and spot spray treatment during creation and maintenance of VMAs. Broadcast spraying is not allowed under the IPMP nor the VMP. Chemical treatment methods used within VMAs include any method approved under the IPMP (including, but not limited to stump spray and/or spot spray). Trees or large shrubs that

require removal within the inner 30 feet of defensible space as well as stubborn woody plants in disclines and fuelbreaks would likely be treated with an application of herbicide to the cut stump. Spot treatments of vegetation within VMAs with other herbicides, as identified in Table 3.5-3, could also be used to the volume limits specified. Spot-spraying with herbicide is sometimes conducted within the inner 30-foot defensible zone, especially next to buildings and fences where it is difficult to operate a brushcutter or mower safely without damaging the structure or equipment.

Herbicides allowed are only those identified in the IPMP EIR and Addendum (Midpen, 2014b; Midpen, 2019b), or that may be approved by Midpen in the future through further addendum processes. Invasive species would be prioritized for removal over native species on Midpen lands. Environmental and public protection measures, certification, the requirements to have a Pest Advisor, and other best management practices (BMPs) are incorporated by reference into the VMP.

Prescribed Herbivory

Midpen has employed both sheep and goats on a small-scale experimental basis for weed control purposes with limited success (prescribed herbivory). Prescribed herbivory under the VMP, with sheep, goats, or cattle, could be used as pre-treatment, typically in shrubland and forest understory, prior to using other techniques. Prescribed herbivory for pre-treatment may require the installation of temporary fencing where natural barriers are not present and temporary or permanent water facilities and other infrastructure (tanks, corrals, fences etc.) as well as the deployment of guard animals and/or a shepherd.

Vegetation Management Strategies by Vegetation Type

Grasslands

Mowing would be used to reduce potential fire spread and increase suppression efficiency in grasslands. Grasses in VMAs would be reduced in height to less than 4 to 6 inches and not cleared to mineral soil to minimize soil erosion. Non-native and/or non-local shrubs and trees, decadent native trees and shrubs (i.e., old plants with a substantial number of dead limbs and twigs), and conifers under 8 inches DBH may be removed entirely. In some instances, limited dead and or downed material may be left in place as a habitat feature if it poses little overall fire risk. Cyclical mowing of grasses in defensible space areas and other ignition zones (around parking lots and picnic areas) would typically be performed annually.

Removal of encroaching woody material would typically occur once every 3 to 5 years in fuelbreaks, depending on the rate of regrowth. The maintenance of VMAs would be based on site-level assessments and implemented to maintain vegetation within the range of desired conditions using previously described tools and techniques. The work would be accomplished by top-cutting with power tools, such as string trimmers and brushcutters, with the infrequent use of chainsaws and heavy equipment with mower heads mounted on articulating arms. Disposal of woody cut material (slash) less than 1-inch DBH would be performed by lopping and scattering. Larger stemmed material would be chipped on-site and removed from the work area or piled and burned on-site after curing for a minimum of 60 days. Removed vegetation

would remain within Midpen lands, but may be trucked out of the area in which the work was conducted in. In some instances, limited dead and or downed material would be left in place as habitat features if it poses little overall fire risk. Herbaceous vegetation would not be mowed during the creation of FRAs.

Shrublands (Coastal Scrub, Chaparral)

Shrubs would be removed or thinned until spacing between individual shrubs or shrub islands is more than double the height of the canopy (e.g., for shrub canopies 6 feet in height, 12-foot gaps would be created). Along property boundaries, shrubs may be completely removed to a width that reduces direct flame contact from adjacent developed properties, to a maximum of 100 feet. To create or maintain the required gap size, all target invasive species, dead shrubs, conifers, and chamise would be removed only as necessary. In some instances, limited dead and or downed material may be left in place as habitat features if it poses little overall fire risk (e.g., dusky footed woodrat middens, single snags, logs). Rare native species may be pruned but would not be removed in their entirety. Removal of shrubs would be accomplished by top-cutting with hand tools such as chainsaws and brush cutters, and with cutting or masticating heads mounted on heavy equipment. All stumps would be flush cut as low as possible parallel to the slope of the ground surface. Only resprouting target weed species would be completely uprooted, if herbicides are not applied. Uprooting would be minimized on steep slopes. Disposal of the cut material would be performed by chipping, pile burning, or lopping and scattering. Cyclical maintenance in shrublands would typically be performed once every 3 to 4 years, though high densities of weeds may necessitate annual maintenance. The maintenance schedule of VMAs in shrublands would be based on site-level assessments and implemented to maintain vegetation within the range of desired conditions using previously described tools and techniques.

Oak Woodlands and Mixed Hardwood Forests

Understory shrubs, target weeds, and target conifers less than 12 inches DBH would be removed. Depending on the site, more trees may need to be removed to reduce unnatural high densities of trees and to promote late seral conditions. For retained trees, dead limbs up to 12 feet above ground may be removed. Live limbs up to 12 feet above the ground or up to one third of the tree's total live foliage may also be removed. Select snags (standing dead trees) or limited downed woody debris may be retained for wildlife habitat, but snags or other material that pose a high risk of firebrand production in a fire event may be removed. Fuel reduction would be accomplished with hand tools and with cutting or masticating heads mounted on heavy equipment. Disposal of the cut material would be performed by chipping, pile burning, or scattering. Downed trees over 6 inches in diameter would be bucked in place; limbs would be removed; and the main trunk would be cut into lengths sufficient to ensure contact with the ground, chipped, or removed from the work area, if feasible. Cyclical maintenance in woodlands or forests would typically be performed once every 5 years (5 to 10 years or more in FRAs, if needed), though high densities of weeds may necessitate annual maintenance.

These treatments are aimed at removing the flammable understory vegetation to reduce the overall fuel load, as well as to decrease the chance of a crown fire and to preserve the woodland

by removing ladder fuels. This treatment type would create a more open, shaded site as shrubs are removed and smaller herbaceous plants and ferns are retained.

Coniferous Forests
In some coniferous areas, mainly in dense Douglas fir and mixed hardwood forests, reducing the fuel load may require thinning of smaller, mid-canopy trees where densities are high. The trees would be felled and their branches removed for chipping, hauling, or pile burning. The trunks, if small enough, would be chipped, hauled, or pile burned as well. If trunks cannot be chipped or hauled, they may be left standing and pruned for wildlife habitat or cut trunks would be left on the ground. The number of trees to be removed would depend upon the location and site characteristics.

Agricultural Landscapes
Mowing and brush thinning would occur along agricultural service roads that could become ignition sources for adjacent natural areas. Conservation grazing (under the existing Conservation Grazing Program) would continue to be used to reduce fuel loads in grassland areas.

Tree Removal
Individual tree removal may be considered in specific locations to reduce the production of firebrands and spotting during wildland fires and thus reduce risks to public safety. Non-native trees may be removed if they compromise the integrity of a native tree. The IPMP allows for 50 to 100 hazard trees to be removed per year. The VMP would allow up to 50 additional trees to be limbed or removed entirely per year for fire hazard reduction as well as the eucalyptus and acacia tree removal described above. For example, scattered live trees (<10 inches DBH) or SOD-killed trees may be removed at ridgetop locations that are vegetated mainly with grass or chaparral. The removal and disposal of these trees would be conducted as previously described. In some instances, trees may be left in place as a habitat feature until its use by a native species is complete (e.g., wait to fell a tree with a known raptor nest until fledglings have left the nest). Midpen will adhere to local regulations regarding heritage, significant, or protected trees.

3.5.3 Prescribed Fire Plan

Overview
Periodic fires historically were a part of natural ecological processes on Midpen lands; as a result, many species evolved with fire adaptations and need periodic fire for renewal. Without fire, fire-adapted communities are eventually replaced by forest, resulting in a reduction of biodiversity and habitat complexity. Fuel in unburned areas can build up to such a high level that when a wildland fire occurs, it can have devastating effects. Prescribed fire helps to restore ecosystems closer to pre-fire suppression conditions through the removal of dead and accumulated vegetation and treatment of forest disease and invasive species.

The purpose of the PFP is to define the activities that Midpen would implement to reinstate prescribed fire practices on their lands in order to reduce wildland fire risks, while also

preserving and restoring biodiversity and minimizing effects on the environment. The PFP focuses on reducing fuel loads and restoring natural ecological processes in OSPs. The PFP also includes the use of traditional ecological knowledge burns in coordination with Native American tribes.

The description presented in the PFP is programmatic in nature at this time and would be updated with additional details into the burn units, methods, locations, and planning prescriptions as they are developed. Additional review under CEQA is anticipated once the PFP is updated.

Prescribed Burn Units

Burn units are discrete units of land that would be targeted under a single prescribed burn. Burn units are being identified for locations across Midpen lands and generally consist of continuous vegetation types. Burn units are sized to allow a prescribed fire to be implemented in one operational period (typically an 8- to 12-hour shift). Prescribed burns would generally be prioritized by vegetation type, fuels reduction value, and potential for successful implementation. Initial burns may focus on re-establishing prescribed fire training areas. These areas would be used for interagency training on live fire and simulated fires, in an effort to improve resource coordination between Midpen and its neighboring local, state, and federal fire agencies who may participate in future burns. Considerations for prioritization of prescribed burns would be defined in the future, but may include: condition of area or burn unit in terms of forest health, amount of invasive species invasion, and extent of fuel loads; location and ability to manage the burn; and type of vegetation with consideration for improvement of ecosystem function through prescribed burning.

Prescribed Fire Process

Overview

Prescribed fire activities would be implemented in accordance with a pre-written plan (Burn Plan) that identifies land management goals and specific prescribed fire use strategies to safely achieve those goals, with prior approval by the applicable regulatory agencies. Burn Plans specify weather parameters for burning, personnel and equipment needed for implementation/mop up/patrol, contingency plans, smoke management, and post burn monitoring. Before burning is allowed, Midpen must complete the following planning steps:

- Notify BAAQMD or MBARD of the proposed prescribed burn by submitting the Prescribed Burning Smoke Management Plan (SMP; Form Rx-1) form at least 30 days prior to burning.
- Develop Burn Plan in conjunction with CAL FIRE and local fire agency.
- Ensure both the smoke management plan and burn permit are issued and approved.
- Ensure burn is conducted on a permissive burn day as determined by BAAQMD or MBARD.

While Midpen employees would take the lead on defining the location, objectives, goals, and monitoring of the prescribed fire, CAL FIRE or another local fire agency would take the lead role in approving, conducting, and supervising all prescribed fire activities. Prescribed fires would involve planning and pretreatment; definition of burn units; and mop up.

Planning and Pretreatment

Where feasible and effective, existing control lines (also known as firelines) including paved roads, dirt roads, trails, and disclines would be utilized for control lines. These existing lines would be improved by clearing accumulated vegetation on or near the lines; removing dead trees that may fall on, near, or across lines; blacklining; and widening. Blacklining involves pre-burning of fuels adjacent to a control line before igniting a prescribed fire. Blacklining is usually done in heavy fuels adjacent to a control line during periods of low fire danger to reduce heat on holding crews and lessen chances for spotting across the control line. New firelines would be constructed to standards described in the Burn Plan, but typically would be 1-foot to 6-foot wide, depending on location, vegetation type, and type of equipment used to construct the line. Hose lays could be used along firelines at the discretion of the burn boss (a qualified person who supervises all prescribed fire resources and is responsible for the safe and effective implementation of the prescribed fire), or as described in the unit-level Burn Plan. Temporary firelines could be rehabilitated as needed once the prescribed fire is declared out by the burn boss. The unit-level Burn Plan would describe burn unit safety, including potential hazards and mitigations.

Prescribed Fire Implementation

The prescribed fire would be ignited in the planned burn units using approved ignition devices, which may include equipment such as a drip torch or hand-held flare ("fusee"). The Burn Plan would describe the general ignition pattern such as a strip head fire, dot ignition, or other, with discretion given to the burn boss to use the pattern they deem most appropriate given local vegetation and weather conditions. The prescribed fire is allowed to burn to the control lines that define the burn unit.

Mop Up

Mop up is the process by which the prescribed fire is safely put out. Firefighters would extinguish or remove burning material near the control lines during mop up work. Select snags or trees may need to be taken down because of fire inside their trunk and logs may need to be trenched to prevent rolling after an area has burned. Firefighters would also put out any flames or stir up smoking hot spots. The work would start as soon as possible along the back or cooler sides of an active fire. Dependent upon multiple factors (i.e., fire behavior, weather forecast), some crew members could remain on site for extended periods of time (overnight). Mop up work would generally be performed all the way around the edge of a fire. Mop up would be conducted using hand crews, equipment, hose lays, or other methods as described in the unit-level Burn Plan.

Rehabilitation
Rehabilitation would consist of the decommissioning of control lines as well as follow-up weed control after a prescribed fire. Control line decommissioning would generally be limited to the manual re-distribution of duff and brush back into the previous cleared lines to facilitate natural revegetation. It also would provide erosion control and discourage the formation of social trails. Because some weed seeds are stimulated by fire or become readily established in post-fire settings, prescribed burn sites would be patrolled by Midpen's Early Detection Rapid Response (EDRR) crews for 1 to 5 years as needed following a burn event to identify the need for weeding or additional restoration work.

Treatment Types and Methods

Physical Control
The prescribed fire would be controlled using methods and resources described in the unit-level Burn Plan under the direction of the burn boss. Control would be accomplished by or with hand crews, fire engines, hose lays, portable pumps, backpack pumps, and hand tools. Aerial support, such as a helicopter with the ability to drop water, on more complex burns may be utilized as well.

Mechanical Pre-Treatment
Burn units could have limited mechanical pre-treatment to improve firelines or operational safety. Treatments could include, but are not limited to mowing, mastication, chipping, falling of snags, and brushing of roads. These treatments would generally follow those described in the VMP. Pre-treatment could involve removal of live tree limbs, scattering dead and decadent woody brush, top-cutting and scattering of green brush, and installation of control lines, as needed.

Limbing, scattering, and masticating dead material and top-cutting of green material could occur many months to days prior to the burn event, depending on the larger project goals and site conditions. The work would be accomplished with a combination of heavy equipment, power tools, and hand tools. Control line installation would occur within a few weeks or days of the burn event and would be accomplished with heavy equipment or hand tools.

Pile burning, as described under the VMP, could be used to remove cut or dead vegetative material where chipping, hauling, or decomposition are not feasible. Piles could be constructed of vegetative material, covered (to keep dry) and burned when conditions are wet. Depending on the surrounding vegetation and under the advice of a Midpen Resource Advisor, the charred remains could be raked out and the site would be allowed to passively revegetate and/or would be directly seeded with native Santa Cruz Mountain plants.

Prescribed Burn Types
Ecosystem Restoration Burns
All prescribed burns would provide ecosystem restoration benefits. In cases where small areas may not passively revegetate, these sites could be seeded with native species, under the advice of a Midpen Resource Advisor.

Traditional Ecological Knowledge Burns
Traditional ecological knowledge burns could be conducted to protect, restore, or facilitate improved production of or collection of specific plants, trees, or seeds. The use of prescribed burning for cultural resources would be planned and implemented in collaboration with local Tribal representatives.

Training Burns
Prescribed burns could be used for training by Midpen employees as well as cooperating agencies. Training burns could be conducted without ignitions (i.e., "mock burns") allowing personnel to coordinate under a unified command, test communications, equipment interoperability, and contingency response prior to conducting live burn activities. Live burn activities could be used to train personnel on wildland fire suppression tactics. Training burns could be performed as stand-alone burns or in conjunction with any prescribed burn under the direction of the burn boss.

Prescribed Natural Fire
Prescribed natural fire is the process of allowing a naturally ignited fire to burn in a controlled manner or area. The details of implementing prescribed natural fire are only conceptual at this time and would only be applicable under limited circumstances. In the case of multiple ignitions, such as multiple lighting fires, Midpen may need to work with an incident management team to prioritize fire suppression activities on Midpen lands. If there are designated natural areas where a resource could benefit from fire, suppression efforts may be aided by allowing the wildland fire to burn through these areas. Limited equipment, aircraft, and crews can be deployed to stop the wildland fire at the best locations to protect public safety rather than trying to protect natural areas that would benefit from a fire. This type of burn would never dictate suppression tactics but only identify areas that do not require protection from the effects of a wildland fire.

3.5.4 Wildland Fire Pre-Plans/Resource Advisor Maps

Overview
Wildland Fire Pre-Plans and Resource Advisor Maps (referred to as Wildland Fire Pre-Plan henceforth) are map-based documents that can aid CAL FIRE and other firefighting agencies in their efforts in the event of a wildland fire. The maps would help firefighters better understand the operational environment, including where different types of apparatus can access (e.g., Wildland Type 3 fire engines); potential fire management locations; where firefighting resources are located, such as hydrants, water tanks, and ponds; specific buildings or structures needing protection; and where sensitive resources are located that should be protected, if possible. The plans and mapping efforts also identify where additional infrastructure may be needed to support firefighting efforts and critical site-specific information regarding escape routes, including the location of stable bridges, passable roads, gates, and water sources. The pre-plans and maps also indicate where bulldozer lines could be created that may reduce environmental impacts in the event of an emergency, recognizing that firefighting agencies, in consultation

with Midpen as landowner, would need to take the actions they deem necessary to protect human life and property.

The pre-plan for each of Midpen's managed lands would include a detailed map over an aerial image of the area, with a legend. Each map would be accompanied by a short document that describes the roads and trails, the other resources for firefighters, the natural resource protection, the sensitive resources in the managed land, and who maintains the plan. Midpen would prepare and complete all maps by 2022 and updates would be performed as needed to ensure the accuracy of the mapping.

Identification, Improvement, and Installation of Infrastructure to Improve Firefighting Capabilities of Local and State Firefighting Agencies

Overview

During the preparation of each Pre-Fire Plan and Resource Advisor Map and during the subsequent reviews of existing plans and maps, additional infrastructure to improve firefighter response may be identified as needed. The process for planning and installing new infrastructure would involve the development of detailed design plans, additional environmental review (if needed), contracting, and implementation. Assumptions were made regarding the types of infrastructure that may be needed in any one year, as detailed in Table 3.6-1, and the general areas within Midpen lands that the infrastructure may be installed or improved in. Based on the inventory of existing infrastructure, approximately one third of the OSPs may require some new, expanded, or upgraded infrastructure. This Program EIR addresses the addition of infrastructure at a programmatic level. Additional CEQA review, tiered from this EIR, may be needed depending on the project.

Roads and Access

Improvements on existing road rights-of-way or potentially new access roads in areas where adequate access is lacking could be identified. Existing access roads may be widened to allow for larger fire trucks, turnarounds created, and roads extended. Road surfaces may also be graded, and material placed on the surface to create a safer surface for travel by emergency vehicles.

Water Storage Tanks

Water storage tanks may be built in areas where needed and where construction is feasible. Water storage tanks would be sized to store adequate water for firefighting, be accessible, easily connected to the equipment that would use them. Water tanks may be filled from existing water supply sources, wells, pumps, or water tender trucks, as appropriate for the local conditions. Stored water may be treated to limit growth of mold and algae with tank systems sealed to exclude entry of insects and animals. Water storage tanks may also be filled by trucking in water, where access to existing water infrastructure is not available.

Water Supply Pipelines, Hydrants, and Pumps

Water supply infrastructure includes underground pipelines that supply water storage tanks or hydrants. All permanent pipelines that may need to be added to OSPs would be approved for

use in fire service systems and designed for the expected water pressures. Where needed, new hydrants on new or existing pipelines may be added as well as permanent or temporary pumping stations to ensure flow from hydrants or pipelines during firefighting activities. Aboveground temporary pipelines or fire hoses may be used to fill water tanks that are not readily accessible by a water tender or water supply lines. Typically, the water would need to be chlorinated to avoid mold and clogging of pumps.

Staging and Landing Areas
Additional staging/fire management locations and landing areas may be needed in some OSPs or other managed lands. Where possible, these areas would be level, and away from water bodies, sensitive habitats, and riparian corridors. These areas would be constructed to the size needed for expected staging or landing needs, and the appropriate surface treatment (such as mulch or chip) would be applied. Erosion and drainage control would also be installed as needed.

3.5.5 Monitoring Plan
The Monitoring Plan requires monitoring of site conditions before, during, and after treatments or fire events to determine if Program objectives are being met, and if and how vegetation treatment methods should be refined to reach those objectives. Monitoring requirements would vary depending on the activity undertaken and the conditions in the area where the activity is to occur. Individual monitoring protocols would be determined on a case-by-case basis for each project at the discretion of professional Midpen employees and/or as required by mitigation. The Monitoring Plan defines the monitoring scale and monitoring parameters, the methods of monitoring/monitoring protocols, the monitoring prescriptions, and reporting and adaptive management. The Monitoring Plan is an important component of the Program; however, it's implementation would not entail any physical effects to the environment and is not covered any further in this Program EIR.

3.6 Program Implementation

3.6.1 Annual Implementation
The maximum annual acreages of activities to be implemented under the Program are identified in Table 3.6-1. Midpen's objective is to gradually increase annual treatment areas, depending on funding sources and availability of work crews, while minimizing negative impacts to natural resources. The total areas treated yearly would vary based on staffing capacity, funding availability, partnerships, and other resources, but would not exceed the maximum allowable annual treatment by activity, as indicated in the table, below. At least initially, Midpen would focus on creating VMAs for enhanced fire management within the priority VMAs shown in Table 3.5-2.

Midpen anticipates conducting one to two prescribed burns during the first three to five years after establishment of the detailed PFP, anticipated to be completed in 2022. After year five of

the detailed PFP implementation, Midpen could implement as much as three burns a year. A typical burn would be conducted on 50 acres, but the size would vary depending on many factors. The installation of infrastructure improvements identified in each Wildland Fire Pre-Plan and Resource Advisor Map would be implemented at a rate of two to three projects per year.

Table 3.6-1 Maximum Annual Treatments

Activity	Treatment Type	Create New or Maintain Existing	Maximum Annual Treatments (Acres)
Vegetation Management Plan			
Shaded Fuelbreaks	Manual, mechanical, herbicide, pile burn, prescribed herbivory	New	50
		Maintain	100
Non-Shaded Fuelbreaks	Mechanical, herbicide, pile burn, prescribed herbivory	New	5
		Maintain	80
Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	Manual, mechanical, herbicide, pile burn, prescribed herbivory	New	400
		Maintain	400
Target Hazards Fuelbreaks	Manual, mechanical, herbicide, pile burn, prescribed herbivory	New	20
		Maintain	20
Fire Agency New Recommended Fuelbreaks	Manual, mechanical, herbicide, pile burn, prescribed herbivory	New	100
		Maintain	N/A[a]
Ingress/Egress Route Fuelbreaks	Mechanical, herbicide, pile burn, prescribed herbivory	New	25
		Maintain	25
Disclines	Mechanical, herbicide	New	10
		Maintain	60
Midpen Structures and Facilities Defensible Space	Manual, mechanical, herbicide, pile burn	New	As needed
		Maintain	175
Fire Management Logistics Areas	Manual, mechanical	New	100
		Maintain	30
Eucalyptus and Acacia Removal	Manual, mechanical, herbicide	New	20 [b]
		Maintain	10
Fuel Reduction Areas	Manual, mechanical, herbicide, pile burn, prescribed herbivory	New	500
		Maintain	500
Prescribed Fire Plan			
Prescribed Burn (upon completion of a detailed PFP	Manual, mechanical, prescribed burn	New	500

Activity	Treatment Type	Create New or Maintain Existing	Maximum Annual Treatments (Acres)
tiered off the programmatic description provided here)			
Wildland Fire Pre-Plan			
Spur Road and Access Road	Manual, mechanical, herbicide	New	1.5 [c]
Staging and Landing Areas	Manual, mechanical, herbicide	New	5
Water Storage Tanks	Manual, mechanical, herbicide	New	0.1
Water Supply Pipelines, Hydrants, and Pumps	Manual, mechanical, herbicide	New	0.1
Total		**New**	**1,737**
		Maintain	**1,400**

Notes:

[a] Fire agency recommended fuelbreaks are maintained under the applicable category.

[b] An average of 55 trees and a maximum of 105 trees over 8 inches DBH per acre could be removed.

[c] Assumes up to 1 mile of 12-foot-wide roads.

3.6.2 Equipment

Various types of equipment would be used to implement Program activities. While much of the equipment listed in Table 3.6-2 is conservatively shown to be run on gas or renewable diesel, Midpen is incrementally increasing its use of electric equipment to replace as much gas-powered equipment as possible. All listed equipment could eventually be electric powered when suitable equipment and technology is made available. The specific equipment needed to conduct a prescribed burn would be described in the unit-level Burn Plan, and additional aerial equipment may include helicopters of different sizes if needed for implementation or contingency. Equipment used for construction and installation of firefighting infrastructure could include those identified below, but additional types of equipment may be needed, dependent on the type of infrastructure.

3.6.3 Access

Access to conduct Program activities would be entirely from existing roads and trails. No new access roads are included as part of the Program to implement VMP or PFP activities; however, the creation of potential new access roads could be identified as infrastructure improvements in Wildland Fire Pre-Plans/Resource Advisor Maps. Access to work sites, in some cases, would not be directly from maintained trails and roads and would be achieved by creating skid trails, which include foot trails or using former trails that have grown over and can be cleared. Sensitive habitats, creeks, and wetlands would be avoided. Clearing of skid trails would not occur when soils are wet. The skid trails would not be graded or scraped. Skid trails would be rehabilitated following use, which involves de-compacting soils, removing skid lines, distributing surrounding litter/duff back on-site, and obscuring entrance points with brush.

Table 3.6-2 Typical Equipment Used for Program Activities

Vehicle/Equipment Type	Fuel Type[a]
Light duty automobile (car/light truck)	gasoline
Heavy truck	gasoline or renewable diesel
Water truck/tender	renewable diesel
Van/medium truck	gasoline
Wildland Type 6 fire engine	renewable diesel
Wildland Type 3 fire engine	renewable diesel
All-terrain vehicle (ATV)	gasoline or renewable diesel
Chainsaw	gasoline (25:1 or 50:1 with 2-stroke oil) or electric
Brushcutter	gasoline or electric
Stringtrimmer	gasoline or electric
Power pole saw	gasoline or electric
Leaf blower	gasoline or electric
Chipper	renewable diesel
Skid steer loader[b]	renewable diesel
Backhoe[b]	renewable diesel
Excavator[b]	renewable diesel
Tractor[c]	renewable diesel
Crane	renewable diesel
Generator	gasoline or renewable diesel
Drip torch	gasoline and diesel (1:4)
Propane torch	propane

Notes:

[a] Any of this equipment could also be electric powered, where available.

[b] May be used with masticator or mower head.

[c] May be used with disc harrow attached.

3.6.4 Personnel

Personnel needed to conduct various Program activities varies widely dependent upon the project, activity, treatment types, and the year of implementation. The number of workers by treatment type and method is summarized in Table 3.6-3. The scale of the Program activities that could be completed each year would depend on annual staff capacity, funding, partnerships, and other resource availability and would need to be balanced with other Midpen priorities that further the mission, annual Board-approved Strategic Goals and Objectives, and Vision Plan. The specific personnel needed to conduct a prescribed burn would be described in the unit-level Burn Plan. Workforces and personnel needed to install new or improved infrastructure under the Wildland Fire Pre-Plans would vary by project and additional crew may include biological or cultural resource monitors.

The range of workers needed for each Program activity are described in Table 3.6-4. Up to 100 workers, not including additional required prescribed fire or pile burn contingency resources, may be conducting vegetation management activities in a single day, but generally, only a few crews would be operating simultaneously. This number may be increased at Midpen's discretion for implementation or safety reasons.

Table 3.6-3 Personnel Needed to Implement Each Treatment Type and Method

Treatment Type	Treatment Method	Crew Size (Average)	Crew Size (Minimum and Maximum)
Manual and Mechanical	Masticating	5	2-10
	Mowing	5	2-10
	Cutting[a]	5	2-10
	Discing	5	2-10
	Pulling	5	2-10
	Pile Burning	15	10-30
	Flaming	2	1-4
Chemical Application	Glyphosate Round-up Promax; Clethodim; Aminopyralid; Clopyralid; Imazapyr; Triclopyr BEE/TEA	8	1-15
Prescribed Herbivory	Livestock	4	2-8
Burning	Prescribed Burning	50	15-100
Construction and Installation		5	2-10
Traffic Control		4	2-8

Notes:

[a] Chipping is conducted by the same crews as cutting. No additional crew members are needed.

Table 3.6-4 Personnel Needed to Implement Program Activities

Activity	Treatment Type	Crew Size (Average)[a]	Crew Size (Minimum and Maximum)[a]
Vegetation Management Plan			
Shaded Fuelbreaks	Manual, mechanical, chemical application, prescribed herbivory	15	2-30
Non-Shaded Fuelbreaks	Mechanical, prescribed herbivory	15	2-30
Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	Manual, mechanical, chemical application, prescribed herbivory	15	2-30
Target Hazards Fuelbreaks	Manual, mechanical, chemical application, prescribed herbivory	15	2-30
Fire Agency New Recommended Fuelbreaks	Manual, mechanical, chemical application, prescribed herbivory	15	2-30
Ingress/Egress Route Fuelbreaks	Mechanical, chemical application, prescribed herbivory	15	2-30
Disclines	Mechanical, chemical application	5	2-10
Midpen Structures and Facilities Defensible Space	Manual, mechanical, chemical application	15	2-30
Fire Management Logistics Areas	Manual, mechanical	5	2-10
Eucalyptus and Acacia Removal	Manual, mechanical, chemical application	5	2-10
Fuel Reduction Areas	Manual, mechanical, chemical application, prescribed herbivory	15	2-30
Prescribed Fire Plan			
Prescribed Burn	Manual, mechanical, prescribed burn	50	15-100
Wildland Fire Pre-Plan			
Spur Road/ Access Road/ Staging and Landing Areas	Manual, mechanical, chemical application	5	2-10
Water Storage Tanks	Manual, mechanical, chemical application	5	2-10
Water Supply Pipelines, Hydrants, and Pumps	Manual, mechanical, chemical application	5	2-10

Notes:

[a] Crew numbers do not include traffic control as this is location dependent.

3.6.5 Schedule and Timing

Work would generally occur during daylight hours, typically from 7:00 am to 7:00 pm. Program activities would occur year-round with certain tools and techniques confined to specific months due to limitations such as the wet season, species protection requirements, permitting restrictions, and official fire season as determined by Midpen's Chief Ranger or Area Superintendent, as detailed in Table 3.6-5. Prescribed burns would be prioritized based on factors such as location, vegetation type, and complexity, with implementation being dictated by local conditions on the ground. Prescribed burns typically occur from June through November, but other times of year may also be considered. The prescription for any prescribed burn is a set of conditions that considers the safety of the public, fire staff, and probability of meeting the burn objectives. Environmental conditions considered include but are not limited to, windspeed, fuel moisture levels, air temperature, and relativity humidity. Other considerations could include species protection requirements and permitting restrictions. Scheduling and timing for Program activities would be dependent on annual staff capacity, funding, partnerships, and other resource availability and would need to be balanced with other Midpen priorities that further the mission, annual Board-approved Strategic Goals and Objectives, and Vision Plan.

Table 3.6-5 Summary of Typical Timing for Each Treatment Type and Method

Treatment Type	Treatment Method	Typical Timing of Work
Manual and Mechanical	Masticating	April through December
	Mowing	April through December
	Cutting	April through December
	Discing	April through July
	Pulling	April through December
	Chipping	April through December
	Pile Burning	October 31 to Mid-May (wet season)
	Flaming	December through March
Chemical Application	Glyphosate Round-up Promax; Clethodim; Aminopyralid; Clopyralid; Imazapyr; Triclopyr BEE/TEA	Spring and Summer
Prescribed Herbivory	Livestock	Year-round
Burning	Prescribed Burning	June through November[a]
Construction and Installation		Year-round

Note:

[a] Although prescribed burning can occur during June through November, many factors in addition to time of year are considered prior to initiating and conducting a burn.

3.6.6 Applicable Best Management Practices

Midpen has developed BMPs for the IPMP, which apply to the Program as well. All IPMP BMPs apply to this Program and are incorporated here by reference. Midpen has several other manuals and policies with measures and BMPs that apply to Program activities including the Maintenance Operations Manual (MO Manual), Regulations for Use of Midpeninsula Regional Open Space District Lands (LU Regulations), Safety Manual, and RM Policies as well as several BMPs for sensitive species (Midpen, 2019c; Midpen, 2014c; Midpen, 2016b; Midpen, 2014d). Refer to Appendix 3.0-2 for the BMPs used in the analysis. The most recently updated IPMP BMPs as well as other Midpen manuals and policies would apply to this Program in any given year. The most recent IPMP BMPs and other Midpen manuals and policies referred to throughout the Program EIR are available from Midpen upon request.

3.6.7 Annual Planning

Midpen would prepare an Annual Work Plan identifying those treatment areas to be created and maintained in each coming year, with consideration for the higher prioritization areas. At least initially, Midpen would focus on creating VMAs for enhanced fire management within the priority VMAs. The total areas treated annually would vary but would not exceed the maximum annual treatment by activity, as indicated in Table 3.6-1. The objective is to gradually increase annual treatment areas, depending on funding sources and availability of work crews, while minimizing negative impacts to natural resources.

3.6.8 Annual Reporting and Adaptive Management

Reporting would be performed in an annual report to the Board of Directors and on a project-by-project basis for larger scale projects. Individual reports would be prepared for larger scale projects and/or activities that are completed. The annual report would be a synthesis of all vegetation management activities over the calendar year, fire event monitoring (if occurred), and reporting on larger-scale, on-going, or cyclical monitoring. Adaptive management recommendations would be made in the annual report.

Adaptive management strategies would be included in the annual planning and monitoring process. Adaptive management recommendations would be comprised of the following actions:

- Monitoring biological stressor indicators.
- Monitoring management activities and, if warranted, revise approaches or actions.
- Continuing to work with surrounding land management agencies and the public to foster education, research, and volunteer efforts.
- Utilizing new methods and technologies that increase efficiency, reduce costs, and reduce impacts on the environment from fuel management activities.

3.7 Updates to Board-Approved Resource Management Policies to Support the Program

Midpen's Board-adopted RM Policies guide the ongoing management of the natural resources on Midpen lands. Resources covered under the policies include plants, animals, water, soil, terrain, geologic formations, and historic, scenic, and cultural features. A policy analysis was conducted as part of the Program development to ensure that the RM Policies best support the Program objectives and goals. The policy analysis revealed that the goals and components of the Program are generally supported by the RM Policies, however, specific updates to the RM Policies should be made to better address wildland fire management and ecosystem resiliency.

The specific proposed text revisions are available in the Wildland Fire Resiliency Program Resource Management Policies Analysis and Recommendations Report. Making changes to the Board-approved RM Policies is considered a discretionary action, and as such, is subject to CEQA. This Program EIR also addresses the environmental impacts of making these policy changes. The changes would be made upon certification of this Program EIR and approval of the Program. A summary of the key changes is as follows:

- Adding ecosystem resiliency to the Wildland Fire Management policies, including an objective to identify acceptable levels of environmental change that allows for establishment and maintenance of resiliency at the landscape level;
- Adding language to address post-fire restoration and response;
- Adding language regarding the indigenous use of fire and objectives to coordinate with tribes on prescribed burning practices and incorporate traditional ecological knowledge practices of prescribed fire for desired outcomes;
- Adding language that defines and supports programmatic planning efforts to implement wildland fire resiliency activities and address regulatory barriers;
- Adding language acknowledging the adopted Community Wildfire Protection Plans (CWPPs) for San Mateo and Santa Clara Counties and consideration of supporting the CWPPs implementation actions that are consistent with Midpen practices;
- Adding language that defines and describes the importance of adaptive management and decision-making flexibility to respond to ecological feedback;
- Adding an objective to identify the focus of non-fire fuel management actions versus prescribed fire actions;
- Adding an objective to adopt new emerging technology into management methods;
- Allowance for landscape visual changes for fuels management under Scenic and Aesthetic Resource policies; and
- Updates to the Climate Change policies that acknowledges the actions and related tradeoffs that should be considered to avoid large, catastrophic carbon emissions (and major ecological impacts) from large destructive fires, such as selective fuel clearance and controlled prescribed burns.

3.8 Permits and Approvals

Activities or projects carried out under the Program may require permits from resource agencies or local jurisdictions before the work can commence. Table 3.8-1 summarizes some of the permits that may be required.

Table 3.8-1 Potential Permits or Approvals Needed for the Program

Agency	Approval or Notification	Component of Program
U.S. Army Corps of Engineers	Clean Water Act, Section 404, Nationwide Permit 14	Impacts to jurisdictional waters of the U.S., such as for stream crossings for equipment or infrastructure.
U.S. Fish and Wildlife Service	Endangered Species Act Biological Opinion and Take Authorization	If any activities could result in take of a threatened, endangered, or candidate species.
California Department of Fish and Wildlife	Trustee agency for CEQA review	During CEQA compliance process.
	1602 Streambed Alteration Agreement	For impacts to riparian areas or any stream crossings.
	2081 Incidental Take Permit or Consistency Determination	If any activities could result in the death of a state listed species.
California Department of Transportation	Encroachment permits	For encroachment on Caltrans right-of-way.
	Transportation permits	For oversize or overweight vehicles traveling on Caltrans right-of-way.
California Coastal Commission (sought through applicable county planning and building department)	Coastal Development Permit or an exemption	For vegetation management or other development in the Coastal Zone.
California Department of Forestry and Fire Protection	Burn Permit	For any prescribed burn activities.
Bay Area Air Quality Management District	Prescribed Burning Smoke Management Plan (Form Rx-1)	For any prescribed burn activities.
	Open Burning Regulation 5 Notification Form	For any pile burn activities.
Monterey Bay Air Resources District	Smoke Management Plan and Smoke Management Permit	For any prescribed burn activities over 10 acres.
	Prescribed Burn Permit	For any prescribed or pile burn activities.
	Section 401 Water Quality Certification	If a Section 404 permit is needed.

Agency	Approval or Notification	Component of Program
San Francisco Regional Water Quality Control Board or Monterrey Regional Water Quality Control Board	National Pollutant Discharge Elimination System (NPDES) General Permit	For ground disturbing impacts over 1 acre in size.
	Waste Discharge Requirement	For impacts to waters of the state that are not waters of the U.S.
Local Public Works Departments, Building Departments (San Mateo County, Santa Clara County, Santa Cruz County, and local cities)	Various types of encroachment, building, planning, or grading permits	For encroachment into roadways to perform work, for any new fire protection infrastructure that may be needed.
	Local tree protection and brush removal permits based on local ordinances of various counties and cities	For impacts on trees and brush.
	Transportation/ oversize or overweight permits	For oversize or overweight vehicles traveling on local rights-of-way.

4 Environmental Setting, Impacts, and Mitigation Measures

4.1 Introduction

4.1.1 Overview and Approach

This section of the Program EIR presents potential environmental impacts of the Program. An Initial Study was not prepared for the Program because Midpen decided to prepare a Program EIR from the outset of environmental review. CEQA Guidelines Section 15063(a) states that if the Lead Agency determines an EIR will be required for a project, the Lead Agency need not conduct further initial review and may begin work on the EIR. The Program would not result in significant effects for some CEQA topics. A brief discussion of these topics and why they are dismissed from further review is provided in the following section.

4.1.2 Effects Found Not to be Significant

Overview

This section describes the environmental resource topics for which significant effects would not occur as a result of Program implementation. The following resource topics are addressed briefly in this section and then dismissed from further analysis: Agriculture and Forestry, Energy, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Utilities and Services Systems.

Agriculture and Forestry

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program could have a significant impact if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.
- Conflict with existing zoning for agricultural use, or a Williamson Act contract.
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)).
- Result in the loss of forest land or conversion of forest land to non-forest use.

- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use.

Impacts Dismissed

Midpen manages approximately 6,500 acres under its current Conservation Grazing Program. Five OSPs (La Honda Creek, Russian Ridge, Purisima Creek, Skyline Ridge, and Tunitas Creek) use conservation grazing as a method of vegetation management, including fuels reduction. These OSPs are along the San Mateo coast. Midpen leases suitable agricultural lands (currently over 8,500 acres) to tenants with expertise in managing livestock for this purpose. All leases are subject to grazing management plans to ensure that priority resource management goals are being met.

Approximately 7,700 acres of OSP land is in Williamson Act contracts. These contracts are within 21 OSPs (Midpen, 2019). The majority of Midpen lands are designated as "other land" by Important Farmland maps published by the California Department of Conservation, Farmland Mapping and Monitoring Program (California Department of Conservation, 2014a; California Department of Conservation, 2012; California Department of Conservation, 2014b). Forested lands are defined as land that can support 10 percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. Midpen lands encompass approximately 30,000 acres of forest and woodland habitat, including roughly 11,500 acres of redwood and Douglas fir associated coniferous forest and 18,500 acres of other hardwood forest and woodlands.

The Program would involve expansion of vegetation management practices, implementation of prescribed fire, and installation of firefighting infrastructure (e.g., water tanks). Farmlands (primarily grazing lands) that are currently managed and leased by Midpen would not be adversely affected by the Program's implementation as prescribed burning may improve forage quality on grazing land. Proposed activities under the WFRP would not convert or cause changes that would result in the conversion of designated farmland to non-agricultural uses, nor would the Program conflict with an existing Williamson Act contract.

Implementation of the Program would involve selective, controlled removal of trees for the purpose of forest ecosystem resiliency and wildland fire management. The primary role for Midpen is the preservation and protection of forests and woodlands on its lands. Although the Program includes elements to manage forest canopy and structure, the intent is to promote robust and healthy ecosystems, not to permanently convert forest land. Implementation of the Program would not result in the substantial loss of forest land nor would it convert forestry land to non-forestry use. Farmland and forestry are not evaluated further in the Program EIR.

Energy

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program would have a significant impact on energy if it would:

- Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Impacts Dismissed

Several state or local plans for renewable energy or energy efficiency apply to the Program. The Low Carbon Fuel Standard (LCFS) program was adopted by California Air Resources Board (CARB), with the goal of reducing the carbon intensity of transportation fuel in California by at least 20 percent by 2030 as compared to a 2010 baseline. The LCFS program applies to any transportation fuel sold, supplied, or offered for sale in California, except alternative fuel that is not a biomass-based or liquefied petroleum gas, and certain fuel for some specific vehicles and vessels (CARB, 2018). CARB also adopted a suite of regulations, collectively referred to as the Advanced Clean Cars program, that applies to vehicle model years 2015 through 2025 which aims to control smog and soot-causing pollutants and reduce fuel use, which in turn reduces greenhouse gas (GHG) emissions (CARB, 2012).

Midpen has adopted a Climate Action Plan to identify goals and strategies to reduce GHG emissions generated by Midpen activities. The Climate Action Plan calls for a 20 percent reduction from the 2016 baseline in 2022 and ultimately an 80 percent reduction by 2050. Strategies are identified to reduce GHG emissions associated with four different sectors, one of which is "vehicle fleet, equipment, and business travel," which would apply to the vehicles and equipment used during implementation of the Program. Some of the strategies correlate to reducing energy use, primarily non-renewable fuels. Applicable strategies include switching tanks and fueling stations to renewable diesel (V1, which was completed in September 2018), acquisition and testing of new electric equipment (V4), purchasing a hybrid or electric vehicle for field offices (V6), and assessing feasibility of alternative fire response models with lower emissions (V7) (Midpen, 2018). Refer to Section 4.7: Greenhouse Gas Emissions for further description and analysis of regulations intended to reduce GHG emissions that would also correlate to energy use. The equipment and vehicles that would be used to implement Program activities would consume energy, including gas, diesel, and motor oil. The use of mechanical equipment (e.g., brushcutters, chainsaws, chippers) would increase as well as the number of passenger vehicle trips to transport crew members to the work sites. The passenger vehicles used to transport crew members to Midpen lands would consume energy as well as the trucks and vehicles within Midpen lands to transport crew members and equipment to work areas. Vehicle engines and fuel used during implementation of the Program would comply with energy reduction and efficiency requirements at the State and local level. The diesel-powered

off-road equipment and Midpen vehicles used during Program implementation would use renewable diesel in accordance with Midpen's Climate Action Plan.

The hours of equipment use to conduct the maximum annual Program activities is estimated to increase by nearly 20 times current levels of use to conduct fuel management activities, increasing annual energy use. Fuel consumption varies by the type of vehicle or piece of equipment and the associated horsepower, the terrain, and the amount of time that it takes to conduct the activity. The annual average number of workers proposed under the Program would increase from approximately five workers per day under existing conditions to 30 workers a day, assuming maximum Program implementation. The total miles driven a year associated with worker trips, transport of workers to work areas, and trucks arriving to work areas (e.g., Wildland Type 6 fire engine) would increase from an estimated 31,000 miles a year to up to 304,500 miles a year (approximately 10 times greater) resulting in an increased use of energy. The estimated increase in fuel use between baseline conditions and the maximum year of Program implementation is shown in Table 4.1-1.

For perspective, per capita energy use in 2018 was 202 million British thermal units (Btu) and total consumption was 7,967 trillion Btu in California (USEIA, 2020). As such, the energy used to implement the Program during a maximum year would be the equivalent to the energy used by approximately 45 Californians. That energy would be expended over the 65,000 acres of Midpen lands. Average energy use in California in 2018 was 76.6 million Btu per acre[1] (USEIA, 2020). Even with the Program, the total energy usage per acre, per year on Midpen lands is approximately 0.14 million Btu, or approximately 0.2 percent of the State average energy usage per acre in 2018.

Table 4.1-1 Estimated Energy Use During Baseline Conditions and the Maximum Year of Implementation

Fuel Type	Baseline Conditions (gallons)	Maximum Year of Implementation (gallons)	Net (gallons)	Energy Use (million Btu)
Diesel	10	1,370	1,360	1,448
Renewable Diesel	5,600	64,300	58,700	7,486
Gasoline	1,500	13,500	12,000	188
Propane	50	250	200	18
Gasoline and Diesel (1:4)	<1	170	170	22
Total				**9,162**

Source: (Barrington Diesel Club, 2020; USDOE, 2020)

[1] 7,967 trillion Btu used in total in 2018 in California, divided by 104 million acres of land in California.

The use of fuel to implement the Program is insignificant compared to overall energy used in the State as compared to energy used per person and per acre. The proposed fuel consumption would, additionally, be considered beneficial and not wasteful given the positive outcome of the work to improve ecosystem health and reduce wildland fire hazards. Implementation of the Program would not cause a significant impact due to wasteful, inefficient, or unnecessary consumption of energy resources. Energy use is not evaluated further in the Program EIR.

Land Use and Planning

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program could have a significant impact if it would:

- Physically divide an established community.
- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

Impacts Dismissed

Predominant land uses on Midpen lands are open space and recreation. Agricultural uses also occur in some OSPs as well as some rural residential uses. Much of Midpen lands abut or surround low density residential development located in the incorporated communities or unincorporated areas of San Mateo, northern Santa Cruz, and Santa Clara counties. Residential land uses adjacent to all OSPs total approximately 75 acres of land, which comprises less than 0.2 percent of the total Program area (Midpen, 2011).

Midpen has adopted the *Regulations for Use of Midpeninsula Regional Open Space District Lands*, which are also referred to as land use regulations. The land use regulations include many stipulations intended to reduce environmental impacts from visitors, contractors, employees, and other users of Midpen lands (Midpen, 2014). Midpen lands are located within numerous jurisdictions in the region, including unincorporated San Mateo, Santa Clara, and Santa Cruz Counties and are adjacent to 17 incorporated communities, each of which have their own land use regulations and plans.

Implementation of the Program would not involve any new development or changes to land uses that could physically divide a community. The actions covered under the Program would not change the overall natural landscape of Midpen lands, although it would expand current practices of managing it. Some firefighting infrastructure, such as roads or water tanks, may be constructed, but all activities conducted under the Program would comply with Midpen and local land use regulations and policies. No aspect of the Program would conflict with any land use plans or policies. Midpen's RM Policies would also be updated upon certification of this Program EIR to further support the actions described in the WFRP, ensuring no conflicts between the program and existing policies. Land use and planning is not evaluated further in the Program EIR.

Mineral Resources

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program could have a significant impact if it would:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Impacts Dismissed

Mineral resources of significance found and extracted in Santa Clara County include construction aggregate deposits such as sand, gravel, and crushed stone, as well as salts derived from evaporation ponds at the edge of San Francisco Bay (Santa Clara County, 1994). In San Mateo County, the principal mineral resources found and extracted include mineral water, salines, and crushed stone (San Mateo County, 1986). Rock suitable for road-base construction is found throughout the mountainous regions of both counties. Several active mining operations are located in Santa Cruz County, which provide important mineral resources for industrial uses (including glass and portland cement manufacturing) and construction purposes. Mineral resource lands have been classified by the State Geologist and designated by the State Mining and Geology Board as containing significant mineral resources (Santa Cruz County, 1994).

A significant mineral resource area is located adjacent to the Purisima Creek Redwoods and Tunitas Creek OSPs and valuable limestone deposits are currently mined for cement in the Kaiser Permanente quarries along Monte Bello Ridge, near the Monte Bello, Picchetti Ranch, and Rancho San Antonio OSPs (Santa Clara County, 1994; San Mateo County, 1986). The La Honda oil field, a significant mineral resource area in the southwest portion of the La Honda Creek OSP, was closed in the early 1990s (San Mateo County, 1986). Although there are no active quarries on Midpen lands, the Kaiser Permanente and Stevens Creek quarries are in close proximity to the Monte Bello, Picchetti Ranch and Rancho San Antonio OSPs respectively and the Lexington Quarry is near the Sierra Azul OSP. Active quarries are also located in proximity to the Miramontes and Russian Ridge OSPs (San Mateo County, 1986).

Program activities would not result in the loss of availability of a known mineral resource within Midpen lands nor result in the loss of an active recovery site on adjacent lands. The Program involves the management of vegetation and would not alter land uses, access, or subsurface areas that could impact mineral resources. No impact on mineral resources would occur. Mineral resources are not evaluated further in the Program EIR.

Population and Housing

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program could have a significant impact if it would:

- Induce substantial unplanned population growth in an area, either directly or indirectly.
- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

Impacts Dismissed

Midpen lands serve 17 cities and unincorporated areas in San Mateo, Santa Clara, and northern Santa Cruz counties with a combined population of over 700,000 residents. The OSPs are comprised predominantly of natural open space and land in agricultural production; however, some residences are located on OSPs and many of the OSPs abut small areas of low-density residential development.

Implementation of the Program would not change land uses nor involve alteration or removal of any housing units. The Program would involve construction of new infrastructure to support fire suppression, but would not result in creation of the types of infrastructure or services that would draw new residents to the area. Any infrastructure developed would be to accommodate existing need for firefighting access and activities. The Program would not induce population growth because it would not involve any alteration of existing land uses or the introduction of new land uses associated with population increases (e.g., housing, employment centers). An increase in workers could be required to implement the Program for more days annually; however, the overall increase in employment opportunities from Program implementation would be minimal (most likely, on the order of fewer than 30 full-time-equivalent jobs). Workers are anticipated to be sourced from the existing and projected population in the region. Program implementation would not result in the displacement of people or housing from Midpen lands or surrounding lands. Population and housing would not be directly or indirectly induced. No impact related to population and housing would occur with implementation of the Program. Population and housing are not evaluated further in the Program EIR.

Public Services

Significance Criteria

Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program could have a significant impact if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
    i. Fire protection

ii. Police protection
iii. Schools
iv. Parks
v. Other public facilities

Impacts Dismissed
Midpen collaborates with local agencies to ensure comprehensive provision of public services. Midpen employs patrol staff (rangers), to augment police and fire protection services provided by other agencies. Rangers are peace officers and patrol the OSPs to enforce federal, state, and local laws, as well as Midpen regulations and occasionally perform fire suppression. Supervising rangers are responsible for overseeing the ranger activities as well as for coordinating with police, fire, and other park agencies regarding public safety concerns on or adjacent to Midpen lands.

Fire protection services are provided by local fire departments and volunteer fire companies within Midpen lands, as well as CAL FIRE, which provides fire protection in the State Responsibility Areas, which encompasses the majority of land within the OSPs. Law enforcement services on Midpen lands are provided by local police departments, and the respective County sheriffs' offices serve unincorporated areas of San Mateo, Santa Clara, and Santa Cruz counties. The California Highway Patrol responds to vehicular accidents, including those involving pedestrians, bicyclists, and equestrians. State and county park rangers provide law enforcement within state and county parks, respectively.

Program implementation would not directly or indirectly induce population growth, necessitating more public services. Activities implemented under the Program would not result in an increase in the number of visitors to Midpen lands. The Program would not result in the construction of additional housing, commercial, or industrial development. No new or altered governmental facilities would be needed to provide public services as a result of the Program, and the Program would not result in increased demand for public services. No new or physically altered governmental facilities would be needed. Public services are not evaluated further in the Program EIR.

Utilities and Service Systems

Significance Criteria
Consistent with State CEQA Guidelines Appendix G (Environmental Checklist), the Program could have a significant impact if it would:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.
- Have a sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

- Result in a determination by the wastewater treatment provider which serves or may serve the project that is has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.
- Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Impacts Dismissed

Water for use in administrative buildings and public facilities on Midpen OSPs generally comes from springs, creeks, and groundwater or from commercial water supplies. Irrigation water for agricultural production on Midpen OSPs comes from on-site surface waters, springs, and wells. Wastewater from public restrooms on Midpen OSPs is stored in on-site vaults before removal and disposal by local service providers. Solid waste disposal services on Midpen OSPs are provided for employee and tenant residences by local providers. Midpen facilities are not typically served by municipal storm drain facilities.

PG&E maintains power lines and underground gas lines through many of the OSPs. PG&E maintains these facilities through easements. Standards for vegetation management and clearance requirements under PG&E utility lines are governed by GO 95, Section III of the CPUC. PG&E retains the responsibility for vegetation clearance associated with PG&E infrastructure, under the jurisdiction of the CPUC (and not Midpen), by law.

Environmental impacts associated with the rate of stormwater runoff and stormwater quality are discussed in Section 4.9: Hydrology and Water Quality. Impacts related to increased demand for stormwater drainage facilities are not discussed further in this Program EIR, because most Midpen facilities are not served by municipal storm drains, and implementation of the Program would not impact existing stormwater drainage facilities.

Implementation of the Program could involve use of water during ground disturbing activities related to installation of firefighting infrastructure such as landing areas and water tanks. This increase in water consumption would be small compared to the quantity of water available and would not substantially increase the volume of water used in the OSPs. Temporary restrooms for workers may be available during construction, large-scale vegetation management, or prescribed burn activities. The sanitation contractor providing the portable restrooms would dispose of the waste at a sewage treatment plant in compliance with standards established by the San Francisco Bay RWQCB and would not exceed or violate wastewater treatment requirements. The amount of wastewater generated by the small number of workers on-site at one time would not exceed existing wastewater treatment capacity. Adequate wastewater and water treatment facilities are available. As such, implementation of the Program would not necessitate the expansion of any water or wastewater treatment facilities.

Implementation of the Program would not be anticipated to result in a significant quantity of solid waste if any. Any waste generated, such as spent vehicle batteries or garbage and refuse generated by workers would be properly disposed of at the appropriate facility. Biomass generated from vegetation removal activities would be processed using a masticator. The masticator would leave behind chips and pieces of shattered wood which would be hauled offsite to use as ground cover or erosion control in other areas. Midpen may also set up permanent composting sites near field offices to stockpile chips and other vegetation material generated by the Program for use on future projects. Generally, the Program would not use local or regional composting facilities to dispose of biomass, although removal of more flammable trees, such as eucalyptus may require some off-site hauling. Off-hauling would be to a permitted facility that has capacity to accept the materials, otherwise materials would be chipped on-site. Implementation of the Program would not significantly affect permitted capacity of local or regional solid waste disposal services serving the Midpen lands. The Program would not change existing levels of compliance with federal, state, and local regulations related to solid waste. No impact related to utilities and service systems would occur with implementation of the Program. These issues are not evaluated further in the Program EIR.

4.1.3 Scope of the Program EIR

Resource Topics Addressed in Detail

Chapter 4: Environmental Setting, Impacts, and Mitigation Measures of the Program EIR discusses the environmental and regulatory setting, impacts, and mitigation measures (MMs) for each of the following technical issue areas (Sections 4.2 through 4.12):

- 4.2 Aesthetics
- 4.3 Air Quality
- 4.4 Biological Resources
- 4.5 Cultural and Tribal Cultural Resources
- 4.6 Geology and Soils
- 4.7 Greenhouse Gas Emissions
- 4.8 Hazards, Hazardous Materials, and Wildland Fire
- 4.9 Hydrology and Water Quality
- 4.10 Noise
- 4.11 Recreation
- 4.12 Transportation

Significance Criteria

The CEQA Guidelines define a significant effect on the environment as, "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Program including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic and aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant"

(CEQA Guidelines Section 15382). Definitions of significance vary with the physical conditions affected and the setting in which the change occurs. The CEQA Guidelines define the physical impacts that trigger the requirement to make "mandatory findings of significance" (CEQA Guidelines, Section 15065). For all environmental issues, this Program EIR identifies specific standards of significance.

This Program EIR uses a variety of terms to describe the levels of significance of adverse impacts identified in the environmental analysis. The following terms are used in this Program EIR:

- **Less Than Significant Impact:** Impacts that are adverse but that do not exceed the specified standards of significance (no mitigation required).
- **Potentially Significant Impact:** Significant impacts that may ultimately be determined to be less than significant. The level of significance may be reduced in the future through implementation of policies or guidelines (that are not required by statute or ordinance), or through further definition of the Program detail in the future. Potentially significant impacts may also be impacts for which there is not enough information to draw a firm conclusion. For CEQA purposes, a potentially significant impact is treated as if it were a significant impact and requires the identification of feasible mitigation measures.
- **Significant Impact:** Impacts that exceed the defined standards of significance but can be eliminated or reduced to a less than significant level through the implementation of feasible mitigation measures or feasible alternatives.
- **Significant and Unavoidable Impact:** Impacts that exceed the defined standards of significance and cannot be eliminated or reduced to a less than significant level through the implementation of feasible mitigation measures or alternatives. If a lead agency proposes to approve a program with significant unavoidable impacts, it must adopt a statement of overriding considerations to explain its actions (CEQA Guidelines, Section 15093(b)).

Format of the Environmental Analysis

Overview

Each section begins with descriptions of the regulatory and environmental settings as they pertain to the resource topic. The environmental setting provides a point of reference for assessing the environmental impacts of the Program and the Program's alternatives. The setting description in each section is followed by an impacts and mitigation discussion, which includes impact statements. A detailed explanation of each impact and analysis of significance follows each impact statement. All mitigation measures pertinent to each individual impact are included at the end of the section. The degree to which the identified mitigation measure(s) would reduce the impact is also described.

Existing Environment

According to Section 15125 of the CEQA Guidelines, an EIR must include a description of the existing physical environmental conditions in the vicinity of a program to provide the "baseline

condition" against which program-related impacts are compared. The baseline condition is typically the physical condition that exists at the time the NOP is published. The NOP for the Program was published on April 27, 2020. Therefore, this Program EIR assesses the impacts of the Program in comparison to the existing land uses and resources present at or around that time within and adjacent to Midpen lands.

The NOP was released during a shelter-in-place order across the San Francisco Bay Area due to the global pandemic from the novel corona virus that causes COVID-19. The shelter-in-place had been in place for approximately 6 weeks at the time of the NOP. Certain baseline environmental conditions were atypical, given the circumstances, including baseline traffic and baseline air quality. Traffic volumes were substantially less than typical and as a result, air quality was greatly improved across the region during this time. The analysis in this document considers the baseline conditions at the time of the NOP; however, it was not considerably affected by these changes. Traffic volumes generated by the program would not be substantial and, therefore, baseline conditions did not factor into the analysis. Air quality impacts from the program are based on criteria pollutant emissions limits. The nature of the impacts from the program did not promulgate the need for dispersion modeling that assesses changes or increases in ambient pollutant levels due to a project's implementation. The attainment status of the air basin, also, is not changed over a 6-week period.

Regulatory Setting

This section of each chapter describes the federal, state, and local regulations that would apply to the Program and that could reduce or eliminate potentially significant impacts. The majority of Program activities would be conducted in San Mateo, Santa Clara, and Santa Cruz counties; however, a small portion of Midpen lands (approximately 10 percent) falls within various cities' jurisdictions. The regulatory section focuses on local county policies and regulations as most of Midpen land falls within the counties rather than cities, but Midpen is required to adhere to all local regulations.

Impact Assessment Methodology

This section identifies and describes the methods and assumptions used in the environmental impact analysis and the criteria used to determine the level of significance of environmental impacts, presented as impact statements. Midpen has not formally adopted "significance criteria" and has instead adapted Appendix G of the CEQA Guidelines significance criteria for use in connection with the Program to determine whether the Program would have significant impacts. The Appendix G checklist questions may be used to ensure that potential impacts have been analyzed as required by the CEQA Guidelines. In accordance with the CEQA Guidelines the checklist questions provided in Appendix G may be tailored to satisfy an individual agencies' needs and project circumstances. Where appropriate, the Appendix G questions have been modified to more suitably ensure that all potential impacts are analyzed.

Impact Analysis

The impact analysis under each impact statement describes the environmental effects of implementing the Program. The potential impacts of the Program are determined by comparing

implementation of the Program to the existing environment. The significance determination for each impact is also determined with this comparison. Program impacts are numbered sequentially in each section. A summary impact statement precedes a more detailed discussion of the environmental effects of the Program. The detailed discussion provides the analysis, rationale, and substantial evidence upon which conclusions are drawn. As required by Section 15126.2(a) of the CEQA Guidelines, direct, indirect, short-term, long-term, on-site, and/or off-site impacts are addressed, as appropriate, for the environmental issue area being analyzed.

The first part of the analysis under each impact statement addresses impacts that could occur from implementation of the types of vegetation management tools and techniques that comprise the WFRP, including manual and mechanical techniques, chemical methods, prescribed herbivory, prescribed burning, and access and vehicle travel. Best management practices and/or mitigation to reduce significant effects from WFRP activities is defined as applicable. The second part of the analysis is specific to the plans that comprise the Program. The impacts are a composite of the tools used to implement the plans, given the scale, location, and extent of the plans. The previously defined mitigation by tool and technique is assigned to the management actions, where applicable.

The specific actions, including locations and extent of prescribed burns and infrastructure, that may occur under the PFP and Wildland Pre-Fire Plans have not been identified to the same level of detail as the VMP. Prescribed fire under the PFP and the infrastructure improvements identified in the Wildland Pre-Fire Plans are addressed at a programmatic level. Midpen continues to acquire new lands for preservation as open space. The analyses in this Program EIR of these two plans and Midpen lands is conducted using the data available at the time of this EIR. Additional environmental review may be needed in the future. When specific activities are proposed for either plan or on lands purchased or gifted after preparation of this Program EIR, Midpen would perform project-level environmental review. Prior to approving site-specific activities under these plans or on newly acquired lands, Midpen would evaluate the selected site against the analysis provided in this Program EIR to determine whether additional environmental review is needed.

Mitigation Measures

This section recommends feasible MMs to reduce potentially significant or significant impacts to a less-than-significant level. MMs include the text of the measure, the locations where the measure is applicable, and the performance standards and timing for each measure. Where measures from other resources topics would mitigate an effect, that measure is listed here with a cross-reference to the section where the measure appears in full.

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4.2 Aesthetics

4.2.1 Introduction

This section addresses the visual resources located within Midpen lands. This section includes a description of existing visual conditions as well as an evaluation of the potential effects on visual resources from implementation of the Program. The visual analysis is based on field observations, aerial and ground-level photographs, and publicly available planning documents. No comments related to aesthetic or visual impacts were received during the public scoping period.

4.2.2 Existing Environment

Aesthetic and Visual Concepts

Scenic Quality

The scenic quality of a characteristic landscape, also referred to as scenic attractiveness, is a function of the landscape. Scenic quality is the measure of the visual appeal of a landscape and its relative value; it is determined based on landform, vegetation, color, adjacent scenery, scarcity, and cultural modifications (e.g., roads, buildings, water storage tanks, communications facilities, and power lines). Scenic quality can be high, medium, or low.

Visual Sensitivity

Visual sensitivity is how concerned viewers are about scenic quality. Several factors influence visual sensitivity, including viewer quantity, viewer activity, viewer exposure, and distance between activities and viewers. Sensitivity levels are defined as the following:

- **High sensitivity:** The area is visible from primary travel routes on which viewers have significant concerns about the aesthetic quality of the area. This category includes scenic byways; primary recreation areas; and, areas of biological (botanical), geologic, or historic importance.
- **Moderate sensitivity:** The area is visible from primary travel routes on which viewers have moderate concerns about the aesthetic quality of the area.
- **Low sensitivity:** The area is visible from travel routes and use areas where there are a few viewers that would be concerned about the aesthetic quality of the area.

Sensitivity to Change

Viewers typically have an expectation of what they will see on a particular landscape. The expectation is based on their personal knowledge of the area, whether it is from previous visits at certain moments in time, from information gleaned outside of visiting the lands (e.g., pictures, word-of-mouth, guidebooks), or from personal and emotional values they place on the aesthetic characteristics of the lands. Such perceptions are typically based on a given moment or moments in time and do not consider that the landscape may change over time.

Those who have visited Midpen land more frequently may have an embedded perspective of what the lands "should" look like. The more easily accessible and popular areas (e.g., parking areas, trails near parking areas, vista points, or picnic areas), therefore, have a higher sensitivity to visual change than areas that are viewed less frequently (e.g., remote areas or areas far from established trails).

Several external factors influence a person's ability to perceive an aesthetic change:

- **Degree to which change is apparent in the landscape:** Certain landscapes are naturally more able to undergo changes without the changes being noticeable. A dense forest may, for example, mask aesthetic changes that take place deep in the forest.
- **Distance between activity and viewer:** Activities that are farther away from the viewer are less visually apparent than activities that take place very close to the viewer.
- **Viewer attention:** Activities that are within the viewer's focus are more apparent than those that are outside of or at the edge of a viewer's focus.

Visual Characteristics of Midpen Lands

Regional Landscape Character

Midpen lands are located on the San Francisco Peninsula, south of the City of San Francisco. The character of the regional landscape is influenced by urban, suburban, semi-rural, agricultural, and natural landscape features. The peninsula is part of the Santa Cruz Mountains area, with terrain that features steep, narrow canyons, water courses, and rolling hills. The mountains separate the flat baylands and Santa Clara Valley on the east side of the peninsula from the coastal areas on the west side of the peninsula. Seasonal streams flow from the upper slopes of the mountains, with steep-sided forested canyons and ridges extending to the bay lands and to the coast. Ridge-top grasslands, or balds, provide open areas within the more densely forested landscapes. The western slopes of the Santa Cruz Mountains are densely forested with redwood and Douglas fir, mixed evergreen forest, and coastal scrub. The drier eastern slopes are vegetated with chaparral, grasslands, mixed evergreen forest, and oak woodlands. Protected drainages host riparian and mixed evergreen forest with large native oaks and California bay trees in some areas. Agricultural landscapes that include vineyards and conservation grazing operations are also interspersed within the grassland areas on the slopes and ridge tops.

Dense urban and suburban landscapes are primarily located along the shores of the southern San Francisco Bay and the Santa Clara Valley, which extends from the southern end of the Bay south to the City of Hollister. Low-density suburban development also extends from the flat baylands westward into the foothills of the Santa Cruz Mountains where narrow, meandering roadways provide access to single family homes situated among the chaparral-covered hillsides. Development on the lower, western slopes of the Santa Cruz Mountains consists of scattered small communities and rural residences. Much of the land in the upper portions of the Santa Cruz Mountains includes natural areas that are held in OSPs and parks. The variety of

intact natural settings and landscapes include scenic vistas from ridge and mountain tops featuring vivid contrasts in vegetation that provide high-quality visual experiences throughout the region.

Landscape Character of Midpen Lands

The visual character of Midpen lands includes a variety of natural landscapes typical of the region, as previously described. These landscapes provide a scenic backdrop to the urbanized areas on the eastern side of the San Francisco Peninsula. Some of the land also includes rural/agricultural landscapes that feature structures such as barns and residences set in a working landscape surrounded by pastures or orchards. Well-maintained and actively used structures are part of picturesque and distinctive landscapes set against the backdrop of adjacent natural areas. Midpen facilities such as trails, restrooms, parking lots, fencing, offices, and residences are designed to blend into the natural surroundings and are typically located within or adjacent to previously disturbed areas. Table 4.2-1 summarizes the landscape character of each of the OSPs. Figure 4.2-1 demonstrates several views exemplifying the visual characteristics of Midpen lands.

Scenic Quality

Many of the OSPs, other managed areas, and surroundings are largely in an intact natural state, with visually distinctive natural features. Vegetation consists of chaparral-covered hillsides, open grassy balds on ridge tops, forested canyons, and riparian vegetation; therefore, Midpen lands possess a high level of scenic integrity. This high level of scenic integrity, combined with public access to recreation trails and open space, provides nearby residents and visitors to the area with striking views of forested areas, grasslands, oak woodlands, and scenic vistas from ridgelines and peaks of the Bay Area and the Pacific Ocean. The overall scenic quality of Midpen lands is high because of the highly varied topography, vegetation patterns, water bodies, and uniqueness adjacent to an urban/suburban setting.

Viewer Exposure and Sensitivity

The main viewer groups that would be exposed to any activities implemented under the Program would be the general public engaging in recreational activities on trails and at recreational facilities, tenants of residences and agricultural properties leasing land from Midpen, Midpen employees at buildings or working in the field, and motorists traveling adjacent to Midpen lands on area roadways. Due to the proximity of Midpen lands to a large urban area, many people have access to and recreate within Midpen lands. Viewer exposure is high, and most recreationalists would be aware of and sensitive to changes in visual resources.

Table 4.2-1 Description of Landscape Character of Midpen Lands

Managed Land	Description
Bear Creek Redwoods OSP	Located on the southeast portion of the Santa Cruz Mountains, the 1,432-acre Bear Creek Redwoods OSP is defined by its secondary-growth redwood forests and extensive areas of Douglas fir forest and oak woodland. Dense, closed-canopy redwood and fir forest are found along the canyons on moist, relatively sheltered slopes, with redwoods concentrated along streams. Drier, exposed ridges within the preserve support grasslands and open, mixed-species forest of evergreen hardwoods, including California bay, coast live oak, tanoak, California black oak, canyon live oak, and madrone as well as fir and redwood. Riparian and aquatic vegetation is restricted along the main channels of the perennial creeks and narrow bands of emergent freshwater marsh vegetation around the perimeter of the three ponds. These three permanent ponds are Mud Lake, Upper (or Front) Lake, and Lower (or Alma) Lake.
Coal Creek OSP	Coal Creek OSP is 500 acres in size and is characterized by its grassland and oak woodland vegetation communities. Rolling grass hills are located along the ridge lines, and mixed oak woodlands are found further down slope. Seasonal streams and waterfalls are present within this preserve during winter and spring.
El Corte de Madera Creek OSP	The 2,906-acre El Corte de Madera Creek OSP is located in the upper headwaters of the San Gregorio Creek Watershed. This preserve is characterized by steep terrain with valleys containing perennial creeks that flow through mixed evergreen and redwood forests. The ridgelines are composed of redwood forests. A large tafone sandstone formation is located in the northern portion of the preserve.
El Sereno OSP	El Sereno OSP is 1,415 acres in size and is largely composed of chaparral vegetation communities, with some mixed-oak woodland near the creeks. The chaparral vegetation communities within this preserve most commonly include California bay laurel, chamise, coyote bush, and yerba santa. Several grassland meadows are interspersed within the chaparral communities. Mount El Sereno, located south of the town of Saratoga and west of the Town of Los Gatos, is the prominent geologic formation of this preserve.
Felton Station	Felton Station is a very small, 44-acre preserve vegetated primarily with conifer forest. A stream with riparian vegetation traverses the preserve.
Foothills OSP	Foothills OSP is a small, 212-acre preserve characterized by steep slopes covered in chaparral, with oak-madrone woodland in the ravines and north-facing slopes. The ridges comprise grassland vegetation communities. The steep and forested ravines form part of the Adobe Creek watershed.
Fremont Older OSP	Fremont Older OSP is a 739-acre preserve characterized by chaparral, grassland, and oak-covered ridges that drop steeply into Stevens Canyon. Maisie's Peak, located in the southern portion of the preserve, is the highest geologic feature. Hunters Point, a 900-foot hilltop, is another notable feature, providing sweeping views of the Santa Clara Valley. Remnants of fruit and nut orchards and hay fields can still be found within the landscape.
La Honda Creek OSP	La Honda Creek OSP is a large 6,100-acre preserve containing mixed oak woodland and redwood forests to the north and grasslands to the south. Cattle ranching is ongoing within the grasslands of Lower and Central La Honda Creek. Harrington Creek traverses the central portion of the preserve and contains conifer forest and mixed riparian vegetation.

Managed Land	Description
Long Ridge OSP	Long Ridge OSP connects to Skyline Ridge OSP and Russian Ridge OSP via one of the longest continuous segments of the Bay Area Ridge Trail. This preserve is composed of oak savannah and grassland-covered ridges dropping into ravines composed of coniferous forest. Chaparral vegetation communities are interspersed throughout the preserve.
Los Trancos OSP	The 274-acre Los Trancos OSP sits at an elevation of about 2,000 feet. Forest and oak woodland vegetation cover the majority of the preserve, with grassland found around the perimeter. The San Andreas Fault runs through the center of the preserve.
Miramontes Ridge OSP	Miramontes Ridge OSP is located in the hills above Half Moon Bay and is composed mainly of coastal scrub vegetation, with small pockets of chaparral and grassland scattered throughout.
Monte Bello OSP	The 3,436-acre Monte Bello OSP encompasses the upper Stevens Creek watershed from Monte Bello Ridge to Skyline Ridge. Rolling grasslands can be found along the ridges, and a dense span of coniferous forest is in the southwestern portion of the preserve. Mixed riparian vegetation is dispersed along the creek banks. Chaparral is distributed in the southern portion of the preserve along the eastern facing slopes. Black Mountain is a prominent geologic feature within the preserve, offering vistas of the Santa Clara Valley and Mount Hamilton Range.
Picchetti Ranch OSP	Picchetti Ranch OSP is located to the west of Stevens Creek Reservoir and is characterized by its mixed oak woodland and chaparral vegetation communities. The ridges are covered in chaparral, which slope into forested canyons composed of madrone, coast live oak, and California bay trees. The Sierra Azul Range is visible in the far distance from the south. The area was originally used as a ranch, with vineyards and orchards scattered throughout. Today, remnants of the orchards are still visible along the hillsides of this preserve, and the Picchetti Winery, built in the late 1890s, is currently leased and operated by a private party.
Pulgas Ridge OSP	Pulgas Ridge OSP is a small, 366-acre preserve located near the City of San Carlos. This preserve is composed primarily of hardwood forest, with a concentration of chaparral to the northwest. Cordilleras Creek cuts through the northern portion of the preserve, with mixed riparian vegetation flanking both side of the creek bank. Small, seasonal streams are scattered throughout.
Purisima Creek Redwoods OSP	The 4,711-acre Purisima Creek Redwoods OSP is located on the western slopes of the Santa Cruz Mountains overlooking Half Moon Bay and Pacific Ocean. Expansive reaches of secondary-growth redwood forests cover the eastern portion of this preserve, which transition to coastal scrub to the west. Purisima Creek Canyon cuts through the middle of this preserve and contains a mix of redwood forests and riparian habitat.
Rancho San Antonio OSP	Rancho San Antonio OSP is an extensive 3,988-acre preserve composed primarily of oak woodland and chaparral vegetation. Grasslands are scattered along the ridges, with a large grassland open space in the eastern portion of the preserve.
Rancho San Antonio County Park	The 165-acre Rancho San Antonio County Park is characterized by its grassland habitat, which spans the ridges, with oak woodland dispersed along the slopes.
Ravenswood OSP	Ravenswood OSP is a 376-acre preserve located in the wetlands of the San Francisco Bay. This preserve is composed of flat marshland habitat, with overlook platforms and benches located at both ends of the trail for birdwatching and other outdoor recreational activities.

Managed Land	Description
Russian Ridge OSP	Russian Ridge OSP is a 3,137-acre preserve composed of coniferous forest, oak woodland, and grassland vegetation communities. Grasslands cover the hills, which transition into oak woodland on the slopes and finally coniferous forests at lower elevations. Mindego Creek flows through the southwestern corner of the preserve, which is flanked on both sides by mixed riparian vegetation. Several other perennial creeks flow through the preserve during the winter and spring.
Saratoga Gap OSP	The 1,540-acre Saratoga Gap OSP is characterized by its expansive oak and Douglas fir forests. Chaparral is found in small pockets throughout. Lichen-covered boulders and sandstone rock outcrops contribute to the visual character of this preserve.
Sierra Azul OSP and Easements	Sierra Azul OSP and associated easements make up Midpen's largest preserve, at 18,000 acres. Due to its size, this preserve contains a range of vegetation types, including serpentine grasslands, chaparral, oak woodland, and dense stands of bay trees. Deep ravines and riparian corridors contain both seasonal and year-round water flow. Guadalupe Creek and Rincon Creek flow through the preserve, flanking both side of Mount Umunhum, one of the highest peaks in the Santa Cruz Mountain Range.
Skyline Ridge OSP	Skyline Ridge OSP contains 2,143 acres of varied landscape, including ridge vistas, expansive meadows, and numerous unique waterbodies. The main vegetation types include mixed evergreen forest, hardwood forest, and grassland, with some chaparral interspersed throughout. Alpine Pond and Horseshoe Lake are in the northern and eastern portion of the preserve, respectively. Stevens Creek and Lambert Creek flow through the preserve along with several smaller perennial streams.
St. Joseph's Hill OSP	The 270-acre St. Joseph's Hill OSP contains grassland, chaparral, and oak woodland vegetation. Los Gatos Creek flows through the northern portion of the preserve, and the Lexington Reservoir is situated directly south. Situated on the eastern edge of the preserve, the 1,253-foot Saint Joseph's Hill features panoramic views of the Santa Clara Valley, Lexington Reservoir, El Sereno, and the Sierra Azul Mountain Range.
Stevens Creek Shoreline Nature Study Area	Stevens Creek Shoreline Nature Study Area is a 50-acre bayfront preserve composed of flat marsh and coastal wetland habitat. Stevens Creek spans the western border of this preserve.
Teague Hill OSP	Teague Hill OSP is located north above the town of Woodside and contains Douglas fir, oak, bay, and madrone forest. Three steep ravines, Squealer Gulch, Tripp Gulch, and Appletree Gulch, cross through this preserve.
Thornewood OSP	Thornewood OSP is a 167-acre preserve located in the hills above the Town of Woodside. Oak and madrone forest cover the majority of this preserve, with secondary-growth Douglas fir and redwood forest flanking the western edge. Shilling Lake is located on the southern edge and hosts a variety of wetland vegetation types. Dennis Martin Creek flows along the eastern border of this preserve.
Tunitas Creek OSP	Tunitas Creek OSP is composed of coastal scrub, with chaparral and grassland scattered throughout.
Windy Hill OSP	Windy Hill OSP is a 1,335-acre preserve composed of grassland, oak, and redwood forest. Open grassland ridges transition into forests of redwood, fir, and oak. Some chaparral is found throughout the preserve.

Figure 4.2-1 Examples of the Landscape Character Within Midpen Lands



Foothills OSP



Stevens Creek Shoreline Nature Area



Windy Hill OSP

Source: (Midpen, 2020a)

Scenic Vistas

Scenic vistas are found throughout Midpen lands along trails and roads. Vistas and viewpoints are where openings along higher elevations provide a lookout across natural areas comprised of diverse vegetation types. Some areas also provide views of the ocean or the San Francisco Bay. Midpen has identified significant scenic viewpoints and areas within Midpen lands, as shown in Figure 4.2-2.

Scenic Highways, Corridors, and Trails

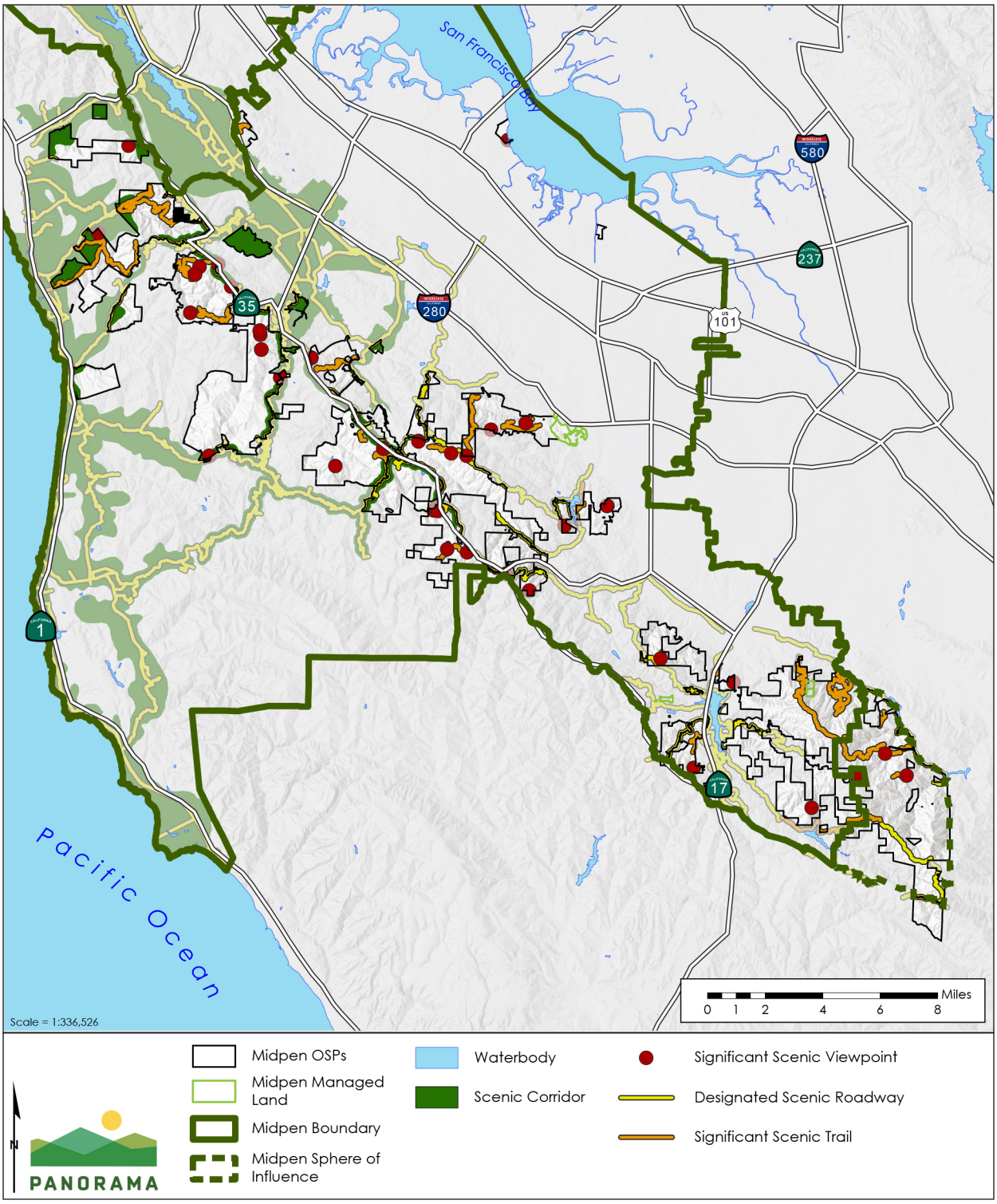
State Scenic Highways

Roads and highways identified as scenic include those established as officially designated and eligible for designation by the State Scenic Highway Program implemented by the California Department of Transportation (Caltrans). Several eligible and officially designated scenic highways are in and adjacent to Midpen lands, as shown in Figure 4.2-2. Highways designated as Eligible that are bisecting or adjacent to Midpen lands include State Route (SR-) 9, SR-17, SR-35, SR-92, SR-152, and SR-236 as well as portions of Interstate (I-) 280. Officially designated State Scenic Highways bisecting or adjacent to Midpen lands include SR-1, SR-9, SR-35, and I-280. SR-1 runs the length of San Mateo County along the Pacific Coast; however, only that portion south of Half Moon Bay to the Santa Cruz County line has State designation. SR-9 is officially designated from the Santa Cruz County line to Blaney Plaza in the City of Saratoga, and Blaney Plaza to the City of Los Gatos. SR-35 traverses the length of San Mateo County and passes through a variety of landscapes; however, only those portions from the SR-92 intersection south to the Santa Clara County line, and from the Santa Cruz County line to the Santa Clara County line, have been officially designated. I-280 runs the length of San Mateo County through the foothills; however, only the portion from a point near the City of San Bruno south to the Santa Clara County line has a State designation (Caltrans, 2019).

Scenic Corridors and Trails

When a city or county nominates an eligible scenic highway for official designation, it must identify and define the scenic corridor of the highway. Scenic corridors consist of land that is visible from the highway right-of-way and is comprised primarily of scenic and natural features. Topography, vegetation, viewing distance, and/or jurisdictional lines determine the corridor boundaries (Caltrans, 2020). Scenic corridors, roadways, and trails are in and adjacent to Midpen OSPs, as shown in Figure 4.2-2. State scenic corridors through San Mateo County include the Cabrillo Highway corridor along SR-1, the Junipero Serra corridor along SR-280, and the Skyline Boulevard corridor. San Mateo County also includes designated scenic corridors along SR-92, SR-84, and several additional County roads (San Mateo County, 1986). The Santa Clara County General Plan and Zoning Ordinance identify several local scenic roadways, including Bear Creek Road, which provides primary access to the Bear Creek Redwoods OSP from SR-35 and SR-17. Other local scenic corridors occur in the area including Alpine Road as designated by the Town of Portola Valley (Town of Portola Valley, 2001).

Figure 4.2-2 Scenic Resources Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; Midpen, 2014a)

4.2.3 Regulatory Setting

Federal

No federal programs or policies addressing visual resources pertain to the analysis of aesthetic impacts for the Program.

State

California Scenic Highway Program

Midpen lands are intersected by several designated and eligible state scenic highways as a part of California's Scenic Highway Program. Managed by Caltrans, the California's Scenic Highway Program was created by the California Legislature in 1963 with the goal of preserving and protecting scenic highway corridors from changes that would affect the aesthetic value of the land adjacent to highways. A highway may be designated "scenic" depending on how much of the natural landscape travelers can see, the scenic quality of the landscape, and the extent to which development intrudes on travelers' enjoyment of the view.

Local

Midpeninsula Regional Open Space District – Resource Management Policies

Midpen's resource management policies include goal and strategies for the management of plants, animals, water, soil, terrain, geologic formations, historic, scenic, and cultural features. These policies are used by Midpen to manage its various lands and open spaces, including those that are a part of the California's Scenic Highway Program. Midpen recognizes the protection of scenic values as one of the primary benefits of open space (Midpen, 2014b). The following goal and policies relate to scenic values:

Goal SA Preserve lands with natural appearance, diversity, and minimal evidence of human impacts.

Policy SA-1 Minimize evidence of human impacts within preserves.

Policy SA-2 Maintain significant landscapes or features that were formerly maintained by natural processes.

Additional language is proposed to Policy SA-2, as part of the Program, to account for visual changes to the landscape for vegetation management activities that can reduce large-scale aesthetic impacts of catastrophic wildland fires The revisions state, "Allow for habitat changes associated with control of vegetation for fuelbreaks, disc lines, and prescribed burns under the concepts of ecological resiliency to reduce larger-scale aesthetic impacts of catastrophic wildfire."

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014c). Midpen uses the Vision Plan to guide management decisions related to the lands and open spaces that

would be a part of this Program. The following themes and goals pertain to the scenic resources and qualities of Midpen lands:

Quiet Enjoyment of Nature:

- Provide opportunities for people to experience, enjoy, and interpret the beauty and tranquility of natural open space.
- Increase access to quiet places to enjoy vistas, encourage connections with nature, and take refuge from urban life.

Sense of Place:

- Preserve the scenic backdrop and designated scenic corridors, emphasizing the view from major roadways and parklands.
- Preserve the character and scenic qualities of the coast and rural areas.

San Mateo County – General Plan

Midpen lands, including the ones that are a part of this Program, within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals and objectives regarding Visual Quality Policies in the San Mateo County General Plan are applicable to visual resources (San Mateo County, 2013):

4.1 Protection of Visual Quality

1. Protect and enhance the natural visual quality of San Mateo County.
2. Encourage positive visual quality for all development and minimize adverse visual impacts.
3. Encourage citizen awareness and interest in San Mateo County's scenic resources.

4.3 Protection of Vegetation. Minimize the removal of visually significant trees and vegetation to accommodate structural development.

Santa Clara County – General Plan

Midpen lands, including the lands that are a part of this Program within Santa Clara County, are subject to the stipulations outlined in the Santa Clara County General Plan. The Parks and Recreation Chapter of the Santa Clara County General Plan provides guidelines for activities along scenic highways (Santa Clara County, 1994). The Zoning Ordinance within the Santa Clara County General Plan designates several local scenic roadways, including Bear Creek Road. The policies that may apply to the Program are listed below:

C-PR 37 The natural scenery along many of Santa Clara County's highways should be protected from land uses and other activities which would diminish its aesthetic beauty.

C-PR 38 Land use should be controlled along scenic roads so as to relate to the location and functions of these roads and should be subject to design review and conditions to assure the scenic quality of the corridor.

C-PR 43 New structures should be located where they will not have a negative impact on the scenic quality of the area, and in rural areas they should generally be set back at least 100 feet from scenic roads and highways to minimize their visual impact.

The Resource Conservation Chapter of the Santa Clara County General Plan includes the following strategies and policies for preserving and enhancing the scenic values of both natural and built environments (Santa Clara County, 1994):

Strategy #1: Manage Growth and Plan for Open Space

Strategy #2: Minimize Development Impacts on Significant Scenic Resources

Strategy #3: Maintain and Enhance the Values of Scenic Urban Settings

C-RC 57 The scenic and aesthetic qualities of both the natural and built environments should be preserved and enhanced for their importance to the overall quality of life for Santa Clara County.

C-RC 58 The general approach to scenic resource preservation on a countywide basis should include the following strategies:

1. Conserving scenic natural resources through long range, inter-jurisdictional growth management and open space planning;
2. Minimize development impacts on highly significant scenic resources; and
3. Maintaining and enhancing scenic urban settings, such as parks and open space, civic places, and major public commons areas.

C-RC 60 Hillsides, ridgelines, scenic transportation corridors, major county entryways, and other areas designated as being of special scenic significance should receive additional consideration and protections due to their prominence, visibility, or symbolic value.

Santa Cruz County – General Plan

Midpen lands, including the lands that are a part of this Program within Santa Cruz County, are subject to the stipulations outlined in the Santa Cruz County General Plan. Chapter 5, Conservation and Open Space, of the Santa Cruz County General Plan contains the following policies related to the Program for scenic protection (Santa Cruz County, 1994):

5.10.2 **Development Within Visual Resource Areas.** Recognize that visual resources of Santa Cruz County possess diverse characteristics and that

the resources worthy of protection may include, but are not limited to, ocean views, agricultural fields, wooded forests, open meadows, and mountain hillside views. Require projects to be evaluated against the context of their unique environment and regulate structure height, setbacks and design to protect these resources consistent with the objectives and policies of this section. Require discretionary review for all development within the visual resource area of Highway One, outside of the Urban/Rural boundary, as designated on the GP/LCP Visual Resources Map and apply the design criteria of Section 13.20.130 of the County's zoning ordinance to such development.

5.10.3 **Protection of Public Vistas.** Protect significant public vistas as described in policy 5.10.2 from all publicly used roads and vista points by minimizing disruption of landform and aesthetic character caused by grading operations, timber harvests, utility wires and poles, signs, inappropriate landscaping and structure design. Provide necessary landscaping to screen development which is unavoidably sited within these vistas.

5.10.4 **Preserving Natural Buffers.** Preserve the vegetation and landform of natural wooded hillsides which serve as a backdrop for new development.

5.10.5 **Preserving Agricultural Vistas.** Continue to preserve the aesthetic value of agricultural vistas. Encourage development to be consistent with the agricultural character of the community. Structures appurtenant to agricultural uses on agriculturally designated parcels shall be considered to be compatible with the agricultural character of surrounding areas.

4.2.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on aesthetics would be considered significant if they would exceed the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway;
- In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point), or in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

(See CEQA Guidelines, Appendix G, I.)

Analysis Methodology

Evaluation of potential aesthetic and visual resource impacts is based on field observations, review of aerial photographs, and photographs of Midpen lands. The determination of impact significance is based on combined factors of visual sensitivity and the degree of degradative visual change that the Program would or could cause.

Visual impacts are assessed based on how much noticeable change the WFRP activities cause. Considerable changes to the form and type of vegetation can occur in some areas, such as removing all dead, dying, and disease-susceptible trees over an acre or more; however, the visual change could still be considered low given that even a few hundred acres of treatment dispersed throughout the Program area is still a small percent of the OSPs. Impacts may also be considered low if the resultant landscape appearance, while very different in vegetative density after treatment, resembles other similar managed landscapes in the region, such that viewers generally would not perceive the change as unnatural or out-of-context.

4.2.5 Impact Analysis

	Significance Determination
Impact Aesthetics-1: Substantial adverse effect on a scenic vista, or substantial degradation of the existing visual character or quality of public views of the site and its surroundings.	**Significant and unavoidable**

Overview

Vegetation and fuel management activities are currently one influence that shapes the visual appearance of Midpen lands. Implementation of the Program would increase the extent of vegetation management areas and the intensity of treatments performed each year. The tools and techniques proposed for use under the Program have all been used before on Midpen lands but at a lower intensity than is proposed under the Program.

Numerous scenic trails, corridors, roads, and viewpoints are located within and adjacent to the OSPs (see Figure 4.2-2) and the visual quality and viewer sensitivity to change throughout most OSPs is therefore high. Temporary visual degradation could occur in some areas during implementation of vegetation management activities, particularly for mowing or from smoke from large-scale prescribed burns. These short-term impacts would be localized and small in scale, and as such are considered to have a less than significant impact on visual character and quality of public views.

Over the long-term, implementation of the proposed Program activities and plans would result in landscapes that generally replicate already existing visual qualities and patterns on Midpen lands and in the region, but with a managed appearance. Visual changes to create fuelbreaks and FRAs, and to remove groves of eucalyptus, may be significant where the areas of treatment are visible for a longer duration from scenic viewpoints, corridors, roads, and trails. The existing trees, such as eucalyptus trees, and existing forest density can be considered visual

resources to some viewers. The loss or alteration of these existing visual resources, as viewed from scenic areas, could be considered a degradation of the existing visual character. The removal of trees and thinning of forested areas may also expose public views that present a new contrast or degrade the character of an area. Impacts to visual quality and scenic views would be significant and unavoidable in some areas. These impacts would reduce over time as viewers adjust to the shifts in vegetation forms and configurations but would initially remain significant.

Midpen lands and open spaces traverse three counties and are subject to compliance with various local laws and ordinances. The Santa Clara County, San Mateo County, and the Santa Cruz County General Plans as well as local cities have guidelines for scenic resources, which Midpen adheres to when managing its lands that fall into those respective jurisdictions. Midpen also has specific regulations for the management of its lands, outlined in the Vision Plan and its RM Policies. Midpen's RM Policies address visual changes and generally promote minimization of unnatural changes and alterations. The Program proposes the following additional language under RM Policy SA-2 in order to ensure that Program activities are consistent with policy: "Allow for habitat changes associated with control of vegetation for fuelbreaks, disc lines, and prescribed burns under the concepts of ecological resiliency to reduce larger-scale aesthetic impacts of catastrophic wildfire."

The following sections present a discussion of the impacts of each of the tools under the Program, followed by a discussion of impacts from implementation of the Program's plans. The discussion of impacts of the various tools and techniques addresses short-term impacts while the discussion of the plans focuses on the longer-term or permanent effects of implementing the Program.

Analysis of Tools and Techniques

Manual and Mechanical Techniques

Midpen currently conducts vegetation management activities to maintain fuelbreaks, defensible space, and fire roads using manual and mechanical techniques. Manual and mechanical techniques of vegetation removal would be used to create and maintain VMAs, as pre-treatment prior to prescribed burns, and to install firefighting infrastructure. Visual effects could occur from the short-term presence of equipment to perform the work as well as from the long-term changes in vegetation patterns from completing the work, the latter of which is addressed under the Analysis of Plans section.

Equipment such as mowers, brush cutters, excavators, and trucks would perform the activities and would be visible on Midpen lands, as shown in Figure 4.2-3. This equipment may appear in contrast to an otherwise natural landscape; however, current maintenance and management in the OSPs includes the use of similar equipment on a regular basis. Most activities would only require equipment in any one area for a short period of time (a few hours to a few days) and the work would be performed in limited areas of Midpen lands at any given time. Visual change related to the presence of equipment and workers is generally considered low because viewers perceive it as temporary and can quickly and easily move to uninterrupted areas of Midpen

lands. Depending on the visual sensitivity of an area, which varies from moderate to high, impacts could occur but would not be considered significant.

Propane flaming would be used on seedlings and annual plants. The small plants would wither and die. This treatment would generally be conducted in a small area and would not significantly affect visual quality due to its low profile and small scale.

In the short term, cut and removed vegetation would be noticeable in the area of vegetation treatment or infrastructure installation. The material may be chipped and left in place, as shown in Figure 4.2-3, or chipped and hauled away from the work area to another part of the same preserve or another preserve.

Figure 4.2-3 Example of Visual Appearance from use of Manual and Mechanical Techniques



Discline treatment and tractor use.



Pulgas Ridge brush treatment and brushcutter use.



Windy Hill's Hawthorns Area treatment and presence of cut vegetation, trucks, and chipping activities.



Windy Hill's Hawthorns Area showing chips left in place after treatment.

Source: (Midpen, 2020b)

Chipped material would be hauled in typical pickup trucks. Similar equipment is used currently and would only be in the work areas within the OSPs for a short duration. Chipped material, if spread on site, would be visible during decomposition. Pile burns may be used to dispose of piled vegetation as well and are conducted currently by Midpen to dispose of cut and dead vegetation. The vegetative material may be covered to facilitate drying and may be left in place until conditions are correct for a pile burn. Pile burns would cover relatively small areas (tens of feet in size). The piles of vegetation would be visible if located near trails or roads but would not detract from the overall character of an area as they are currently utilized, and visual impacts are temporary. Pile burns result in smoke plumes that would be visible from a distance, but the duration of impact would be short (a few hours to a few days at most). Due to the short duration of smoke generation, visual impacts would be less than significant.

Pile burning can impact soils directly underneath the pile due to excessive heating, resulting in a denuded area. Depending on the surrounding vegetation and under the advice of a Midpen Resource Advisor, the site may be allowed to passively revegetate and/or be directly seeded with native Santa Cruz Mountain seed. Since pile burns are small, they would result in very low to no change to the landscape, and visual impacts would be less than significant.

Chemical Application

Chemical control would be limited to application with backpack sprayers in localized areas. These activities are occurring throughout Midpen lands under the IPMP and would continue to be implemented in a similar manner under the Program, albeit at a larger scale or higher intensity. Herbicides would be used on plant species that re-sprout after being cut via manual or mechanical treatment methods. Limited spot treatments may be applied to maintain the management area's objective. Due to localized use of chemical controls (no aerial spraying is proposed), minimal changes to the visual quality of Midpen lands and no change to the view from scenic vistas would occur. The impacts would be less than significant.

Prescribed Herbivory

Prescribed herbivory could be used as pre-treatment to reduce fuel loads prior to implementation of other methods. Visual impacts from prescribed herbivory would include any contrast created from the presence of livestock (e.g., goats), temporary fencing, water troughs, and any visual changes in vegetation appearance associated with the post-grazed area. Presence of livestock in portions of Midpen lands would not have a significant visual impact due to the limited size or area impacted by a grazing operation and the limited visual intrusiveness (particularly from scenic viewpoints, corridors, roads, and trails) of the animals given their compatibility with surrounding rural and agricultural setting. Degradative visual change would be considered low as viewers perceive the presence of livestock as temporary and common in surrounding rural and agricultural landscapes. On some Midpen lands, grazing already occurs and is in keeping with the rural character of the area. Prescribed herbivory would primarily reduce the height of vegetation, which would not degrade visual resources. Impacts would be less than significant.

Prescribed Burning

Prescribed burning has historically been conducted on Midpen lands, but not within the last 10 years. Visual impacts from prescribed burns could occur from the staging prior to and during the burn, from smoke plumes from the burn, from the appearance of scorched vegetation that changes green and brown colors to black, and from the change in vegetation patterns during regrowth after the burn, as shown in Figure 4.2-4. Staging equipment (e.g., water trucks) may be visible but not to a substantial number of viewers and as viewed from scenic viewpoints, corridors, roads, and trails, given the localized areas that would be used for staging compared to the overall size of Midpen lands and trail systems. The areas surrounding the burn would be closed to public access for at least 500 feet around the burn (see MM Hazards-3 in Section 4.8: Hazards, Hazardous Materials, and Wildland Fire) which would limit direct views of the active burn areas. Staging would be limited to a few days. Vehicles and equipment are currently used and seen on Midpen lands for vegetation management activities, including from scenic areas (i.e., viewpoints, roads, trails, corridors). The impact on scenic vistas and visual quality from staging would be less than significant because the visual change would be considered low. Small areas would be impacted at any one time compared to the overall size of Midpen lands, and the impacts would be temporary.

The smoke plume from a prescribed burn would likely be seen from within Midpen lands, including scenic areas, and from public views in the surrounding areas with a direct line of sight toward the plume, depending on the size of the burn. Burns covering larger swaths of land may result in large, visible plumes from outside the immediate burn area. The visual effect would vary based on weather conditions and visibility from scenic vistas or other scenic areas. Smoke would be visible during the burn and could limit the ability to view scenic vistas and could alter the visual quality of the area. However, the length of time that views are affected would be minimal since the actual burn event would not last more than a few days, which would be considered a low level of degradative visual change.

Midpen would be required to prepare a burn plan and submit a smoke management plan to the Bay Area Air Quality Management District (BAAQMD). The smoke management plan specifies the "smoke prescription," which is a set of air quality, meteorological, and fuel conditions needed before burn ignition may be allowed. The conditions are defined with the intention of minimizing smoke emissions. Depending on the size and complexity of the burn, the smoke management plan would contain useful information for managing smoke, such as burn monitoring procedures, smoke travel projections (including maps), smoke minimization techniques, and public notification procedures. If conditions ever deviate from the Burn Plan and smoke management plan, (e.g., winds change direction, humidity decreases), the burn is rescheduled, and crews transition from active burning activities to patrolling and extinguishing. Adherence to the Burn Plan and smoke management plan would minimize smoke emissions from prescribed burning. Although smoke emissions could substantially increase if conditions change, such increases would be temporary as active burning would cease and crews would begin extinguishing the fire; therefore, smoke would quickly dissipate. Compliance with the smoke management plan and the Burn Plan, which are required by law, would minimize smoke

emissions and smoke-related impacts by only allowing prescribed burning to occur when the conditions are appropriate to minimize smoke. Midpen would also alert the public to planned prescribed burns per the smoke management plan. Prescribed broadcast burning would be temporary and any associated smoke emissions would dissipate once burning is complete. Smoke from prescribed broadcast burning would not result in a substantial degradation of a scenic vista or visual character and quality, or substantially damage scenic resources within a state scenic highway. Impacts would be less than significant.

Broadcast burns would require control lines (firelines), which are linear areas clear of vegetation to contain the fire to the intended burn area. Existing control lines would be used as feasible and effective. Some improvement or clearing in and around existing control lines may be needed. Any new control lines would typically be one to six feet wide (similar to a discline as shown in Figure 4.2-3). Fire control lines are customarily created to have "feathered" edges, as opposed to straight lines, to attain a more natural border between the broadcast burn, fire line, and unburned areas, where possible. The visual change from creation of control lines would be short term, as fire lines are typically allowed to grow back in until another prescribed fire in the same area is conducted (which would likely be multiple years in the future). The visual change would be low since these lines would grow back in over time, and impacts would be less than significant.

The impacts from longer-term changes associated with prescribed burning are provided under the Prescribed Fire Plan discussion.

Access and Vehicle Travel

In some locations on Midpen lands, vegetation-management activities would require temporary access routes away from existing roads or trails to transport the equipment needed and to remove slash and chips, if needed. No new access routes would be created, but foot trails or former overgrown trails could be used. These narrow or overgrown paths would be cleared of fallen trees and brush to form skid trails. Following use, the skid trails would be rehabilitated by de-compacting soils as needed and distributing litter on the trails to obscure presence. Visual effects could occur from the short-term presence of equipment to perform the work as well as from the clearing of the skid trails. The longer-term visual impacts of clearing former logging skid trails would not be significant, however, because similar-looking trails are found throughout Midpen lands and the skid trails would be rehabilitated and allowed to revegetate naturally after use. These routes would not be open to recreational use (i.e., the skid trails would not become new recreational trails, which limits their visual impact as experienced by a significant number of viewers). Impacts to scenic vistas and visual character would be less than significant.

Figure 4.2-4 Example of Prescribed Burning Appearance Within Midpen Lands



Active fire, euipment, and personnel present during a prescribed burn at Russian Ridge OSP in mid-2007.



Smoke plume and charred ground from a prescribed burn at Russian Ridge OSP in mid-2007.



Vegetation regrowth at Russian Ridge OSP in spring 2008 after a prescribed burn.



Vegetation regrowth at Russian Ridge OSP 5 years after a prescribed burn.

Source: (Midpen, 2020b)

Analysis of Plans

Vegetation Management Plan

Overview

The VMP would involve creation of new VMAs and maintenance of existing fuelbreaks and defensible space as well as maintenance of the newly created VMAs.

Figure 4.2-5 through Figure 4.2-10 show how several types of VMAs may appear to the public prior to and/or after treatment.

Implementation of the VMP would result in the removal of trees and other vegetation, which may be considered a visual resource by some viewers. Areas of vegetation treatment would be visible from scenic viewpoints from a distance, as well as in the immediate foreground from scenic trails, roads, and within scenic corridors. Changes in patterns of existing vegetation, including color, line, and form associated with existing vegetation types and density may be considered a degradation of existing visual quality in some areas. Mitigation would require pre-planning actions including desktop and field reviews to reduce visual impacts from scenic areas where possible, for example by avoiding vegetation thinning in certain areas or thinning to a lesser extent to avoid or lessen impacts to scenic character or views from designated scenic areas. Mitigation, however, cannot reduce all significant visual impacts as avoidance or reduced thinning may not be possible everywhere that VMAs are needed. Impacts from implementation of the VMP be significant and unavoidable in some areas. Impacts from each of the elements of the VMP are described in more detail in the following sections. Impacts would apply to any new land purchased or gifted to Midpen and added to the Program, where the new areas would include VMAs, areas of prescribed burning under the PFP, and/or new firefighting infrastructure that could be visible from scenic roads, corridors, trails, and viewpoints.

FRAs

FRAs could be created through a combination of treatment methods and could be created in areas throughout many OSPs, as show in Figures 3.5-2 through 3.5-6. The purpose of FRAs is habitat enhancement as well as to reduce fire hazards. Fuel ladders and surface fuels would be reduced in FRAs, and overstory and understory vegetation would be spatially separated so that a ground fire would not, under normal fire conditions, burn too hot and/or climb into the canopy and turn into a crown fire. Forest treatment would be of lower intensity than a fuelbreak but FRAs would typically be at least 100 acres in size.

Views from scenic viewpoints across the OSPs can be variable both in type of vegetation and background views. The FRAs would not likely be discernable in distant scenic views, given the variety of vegetative colors, forms, shapes, patterns, and topography across the landscape and given the lower intensity of treatment and non-linear nature of FRAs (as compared with shaded fuelbreaks). However, given the viewer sensitivity and overall exposure, there could be an adverse visual impact to the existing visual character and quality of immediate foreground views in FRAs from scenic roads and trails in OSPs. The FRAs may only be temporarily visible from roads due to vehicle speeds, unless the road extends through an FRA, but would be visible for extended periods for recreationists using trails. Although large trees and other vegetation would remain in FRAs, less vegetation would be present where these treatments occur and consequently, public views could be degraded. Work could also open background views that open contrast and degrade existing visual character, resulting in a significant impact, although it is less likely to occur in FRAs as compared with fuelbreaks since FRAs require less thinning. MM Aesthetics-1 would be implemented to reduce impacts by requiring planning of treatments and avoiding changes to scenic views, where possible. Like for fuelbreaks, mitigation may not always be implementable to a level that reduces impacts to less than significant. Impacts could, in some areas, be significant and unavoidable.

Shaded and Non-Shaded Fuelbreaks, and Disclines

Shaded fuelbreaks result in tree canopy and understory thinning and removal and overall tree density reduction. Shaded fuelbreaks would be up to 200 feet wide and could be visible from several areas, including in the background views from scenic viewpoint, as well as in the foreground views from scenic roads, scenic trails, and scenic corridors that are located throughout many of the OSPs, as shown in Figure 4.2-2.

Shaded fuelbreaks are often placed along roads and ridgelines where the change in vegetation composition and form would be more visible from a distant scenic viewpoint. Where the density of the forested areas may be considered a visual resource, the alterations to create fuelbreaks could constitute significant visual degradation from these viewpoints. Impacts could also occur in the immediate foreground views from scenic roads and trails. In some areas, thinning of vegetation along a scenic road or trail may open views. Depending on the views that open, should the view be towards a contrasting urban or suburban area or structure, the existing view or visual character could be degraded. Degradation of existing scenic views and visual character would be a significant impact.

Non-shaded fuelbreaks, as shown in Figure 4.2-3, would be created only in areas of grass or shrubs where there are no trees. Disclines are narrow strips (approximately 10 feet wide) where soil is disturbed to 6 to 12 inches to slow or stop fire progression. Disclines are typically placed along the perimeter of undeveloped land, ranches, and roadways. Creation of new non-shaded fuelbreaks and disclines can result in significant visual changes and degradation by introducing permanent contrasting linear visual element in a natural setting. These lines may be visible at a distance from scenic viewpoints, or in the foreground from scenic roads and trails. While shaded and non-shaded fuelbreaks and disclines are currently in limited areas of some of the OSPs, the features would become more extensive through more OSPs under the VMP. The visual changes from the creation of shaded and non-shaded fuelbreaks and disclines would be most prominent in the time after they are created (generally, a year or two). The initial visual change could be great enough to constitute a significant impact, were it visible from a scenic area, that would reduce over time as viewers become accustomed to the managed, but natural landscape. MM Aesthetics-1 would require review of proposed VMAs during annual planning to design and site treatments, where possible, to minimize visual impacts to scenic public viewing areas. As an example, the measure includes avoiding vegetation thinning to a level that could expose a contrasting and degraded view, where possible. The measure may not be implementable in all circumstances.

Figure 4.2-5 Example of Shaded Fuelbreak Treatment Within Midpen Lands



Bear Creek Redwoods OSP near the stable after treatment.

Source: (Midpen, 2020b)

Figure 4.2-6 Example of Non-Shaded Fuelbreak Treatment Within Midpen Lands



Non-shaded fuelbreak treatment conducted along Page Mill Road, which is an important paved evacuation route for residents and an emergency access road for fire response personnel.

Source: (Midpen, 2020b)

Figure 4.2-7 Example of Ridgeline Shaded Fuelbreak 10 Years After Creation (Marin County)



Source: (Panorama Environmental, Inc., 2012)

Figure 4.2-8 Example of Fuelbreak Treatment Within Midpen Lands bordering an Important Evacuation Route



Windy Hill's Hawthorns Area near Alpine Road/Portola Road prior to treatment.



Windy Hill's Hawthorns Area near Alpine Road/Portola Road after treatment.

Source: (Midpen, 2020b)

Figure 4.2-9 Example of Ingress/Egress Route Fuelbreak Treatment Within Midpen Lands



Mowing along ingress/egress route in Rancho San Antonio OSP.

Source: (Midpen, 2020b)

Figure 4.2-10 Example of Defensible Space Treatment Within Midpen Lands



Defensible space near homes at Pulgas Ridge.



Defensible space near homes at Pulgas Ridge.

Source: (Midpen, 2020b)

Where the mitigation measure's implementation would compromise the objectives of the fuel treatment it would not be implemented, and thus, may not fully reduce impacts to less than significant levels. Impacts would remain significant and unavoidable in some areas.

Ingress/Egress Route Fuelbreaks

Ingress/egress route fuelbreaks are typically cleared of all understory vegetation for 10 to 30 feet from road edges (on either side), using primarily manual and mechanical techniques initially, and then mowing annually. Since these fuelbreaks are relatively small in width at 10 to 30 feet, and follow existing roads, which represent an existing break in vegetation and linear feature, their creation and maintenance would not degrade distant views from scenic viewpoints.

Creation of these fuelbreaks could, however, degrade the visual character or quality of views in the immediate area where they are implemented (similar to shaded fuelbreaks), including along scenic roads or trails or within scenic corridors. Viewer sensitivity is high in these areas, and the clearing of vegetation in the immediate foreground could be considered a significant visual change and degradation of existing visual character where the existing tree density is considered a visual resource. Similar to the shaded and non-shaded fuelbreaks, over time, viewers would likely adjust to the appearance of the roadside areas, as would their expectations of visual quality. Initial impacts, however, would be significant and unavoidable. Mitigation would not minimize impacts as the work would need to be performed as prescribed for the fuelbreak to function in ingress and egress route protection.

Fire Management Logistics Areas and Defensible Space

Defensible space is limited to work around existing structures, with most intensive vegetation management occurring within 30 feet of the structure, and all treatments within 100 feet. No new defensible space is currently proposed. Given the existing built structures or features, visual change from the maintenance of defensible space is considered low since it is as an extension of the built environment, and contrast is already high. Impacts would be less than significant. Maintenance of existing fire management logistical areas would not result in substantial visual changes or degradation of visual quality from scenic viewpoints or scenic roads and trails. Fuelbreaks up to 200 feet in width may be created around existing or new fire management logistics areas to provide additional protection. Some tree thinning and removal would be required, but the areas are relatively small (a few hundred square feet to a few acres), and due to the existing disturbance and clearing from the logistic area (e.g., helicopter landing area, refuge area, staging area), creation of new shaded fuelbreaks around these areas would not substantially degrade existing visual quality nor degrade views from scenic roads and corridors because visibility from roads would be short for viewers in vehicles and bicyclists passing by (likely a few seconds). Creation of new landing zones or staging areas may be part of the VMP, but the impacts are covered under the Wildland Fire Pre-Plan discussion.

Eucalyptus and Acacia Removal

The Program includes eucalyptus and other invasive tree removal and planting of native trees and vegetation as appropriate. Where many trees or an entire grove is removed, it could result in a more dramatic change in the land appearance than creation of fuelbreaks or FRAs. Areas of potential eucalyptus removal are shown in Figure 3.5-1 in Chapter 2: Project Description. Not all eucalyptus groves would be thinned or removed in total as part of the Program, but any groves within the OSPs could be thinned or removed throughout the life of the VMP. Several of these groves are visible from scenic viewpoints, roads, corridors, and trails (i.e., from scenic corridors and viewpoints in Miramontes OSP, from scenic corridors and trails in Purisima Redwoods OSP, from scenic viewpoints in La Honda OSP, from a scenic trail in Windy Hill OSP, from a scenic trail and viewpoint in Skyline Ridge OSP, from a scenic viewpoint in Montebello OSP, from a scenic viewpoint at Freemont Older OSP, from a scenic trail and viewpoint at Rancho San Antonio OSP, and from a scenic viewpoint and trail and roadway in Sierra Azul OSP). The visual change from removal of a large number of eucalyptus in one area, such as removing

25 percent or more of the larger trees (over 8 inches in diameter) in a grove, could be considered a dramatic change immediately after removal, and the trees or groves may be considered a visual resource to some viewers. The areas where eucalyptus is removed would likely transition from eucalyptus forest to grassland, shrubland, or oak savannah, all of which are found in other areas of the region as part of the varied but natural landscape. Replanting or seeding of appropriate native species may also occur, depending upon the location. Since the eucalyptus may be considered a visual resource as viewed from scenic areas in the distance as well as in the immediate foreground from scenic roads or trails, the loss of these trees could still be considered substantial degradation of the existing visual quality and, thus, a significant, unmitigable impact.

Summary of the Visual Impacts from the VMP

A summary of the visibility and impacts of the various VMP elements is presented in Table 4.2-2.

Prescribed Fire Plan

Prescribed burning would be implemented within Midpen lands to incorporate the natural fire regime back into the landscape, primarily for ecosystem health and resiliency. Prescribed broadcast burns may be conducted in areas where visibility from scenic viewpoints, trails, roads, and corridors would still be possible. Pre-treatment of a selected area would be conducted using mechanical methods, which could result in piles of cut vegetation for future pile burns or one- to six-foot-wide bands of cleared earth to serve as control lines, if none are present. Typically, existing features, including roads and trails, would be used as control lines. A prescribed burn typically would be conducted on 50 acres. Up to three burns could occur per year in different OSPs or managed lands. Visual impacts of conducting the prescribed burn, including from the presence of equipment to manage the burn, from construction of control lines, and from smoke were previously addressed under the Analysis of Tools and Techniques, and found to be less than significant.

Longer-term visual impacts from a prescribed burn would consist of burnt vegetation at ground level on areas as large as 50 acres each. The visual impacts would depend upon the vegetation community type, but in all cases visual effects are ephemeral, as part of former natural processes, and major changes to composition of the landscape would not occur with the appropriate precautions (refer to Section 4.4: Biological Resources). While the effects would diminish over time, because prescribed burns would change the density of vegetation and color of the landscape to dark gray/black, the burns could still significantly degrade the visual character or quality of public views of the treatment areas until successional vegetation reestablishes. Impacts would be significant and unavoidable in areas where the burn scars are visible from scenic roads, trails, viewpoints, or corridors until the areas grow back in.

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Table 4.2-2 Visual Impact Summary by OSP or Managed Land

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
Bear Creek Redwoods OSP	• Scenic road (Bear Creek Road) • Scenic viewpoint • Scenic trail	• Fuelbreaks (shaded and around a water tank) • Potential FRAs	• Fuelbreaks would be visible in foreground from Bear Creek Road. • Fuelbreak around tank would be visible from scenic viewpoint in the southeast of the OSP, approximately 650 feet from the viewpoint. • FRAs would be visible from the scenic road, scenic trail, and scenic viewpoint.	• Impacts from fuelbreaks around scenic roads would be significant unavoidable even with mitigation. • Impacts from fuelbreaks around tank would be less than significant due to size of the fuelbreak and existing contrast from the tank. • Impacts from FRAs would be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Coal Creek OSP	• Scenic corridor (around Highway 35) • Scenic viewpoint	• Fuelbreaks (shaded) • Potential FRAs	• Up to 200-foot fuelbreaks would be visible in the scenic corridor around Highway 35. • Fuelbreak around Highway 35 may be visible from a scenic viewpoint. • FRAs would be visible in the scenic corridor around Highway 35.	• Impacts from new fuelbreaks in the scenic corridor of Highway 35 and visible from the scenic viewpoint would be significant and unavoidable even after mitigation. • Impacts from FRAs would be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
El Corte Madera OSP	• Scenic corridor (around Highway 35) • Scenic trails	• Fuelbreaks (shaded) • Potential FRAs	• Up to 200-foot fuelbreaks would be visible in the scenic corridor around Highway 35	• Impacts from new fuelbreaks in the scenic corridor of Highway 35 may be significant and

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
	• Scenic viewpoints (5 viewpoints)		• Fuelbreaks would not be readily visible from scenic trails. • FRAs would be visible in the scenic corridor, potentially from scenic viewpoints, and from scenic trails.	unavoidable even after mitigation. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
El Sereno OSP	• Scenic road (Montevina Road) • Scenic viewpoint along Montevina Road	• Fuelbreaks • Ingress/egress fuelbreak • Fuelbreaks around three helicopter zones and one staging area • Eucalyptus/acacia removal (approximately 200 acres) • Potential FRAs	• Up to 200-foot fuelbreak would be visible along the scenic Montevina Road. • Ingress/egress fuelbreaks would not be visible from the scenic road or viewpoint. • Fuelbreaks around helicopter landing and staging areas would not be visible from the scenic road or viewpoint. • Eucalyptus/acacia removal would not be visible from the scenic road or viewpoint. • FRAs could be visible from the scenic road and viewpoint.	• Impacts from fuelbreaks around scenic roads may be significant unavoidable even with mitigation. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Felton Station	• Scenic road above (Black Road)	• Small fuelbreaks around Black Road • Potential FRAs	• Fuelbreak would be visible from the scenic road, but only briefly from vehicles or bicyclists. • FRAs would be visible below Black Rock Road but only briefly from vehicles or bicyclists.	None

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
Foothills OSP	• Scenic road through (Page Mill Road)	• Fuelbreaks • Potential FRAs	• Up to 200-foot fuelbreak would be visible along the scenic Page Mill Road • FRAs would be beyond the fuelbreaks created around scenic Page Mill Road and would not be visible from the road.	• Impacts from an up to 200-foot fuelbreak along the scenic road may be significant and unavoidable even after mitigation. **Mitigation** MM Aesthetics-1
Fremont Older OSP	• Scenic road (Stevens Creek Tony Look Trail) • Scenic viewpoint	• Fuelbreaks • Ingress/egress fuelbreaks • Fuelbreaks around helicopter landing areas • New disclines • Eucalyptus/acacia removal areas • Potential FRAs	• Fuelbreaks would not be readily visible from the scenic road. Potential visibility from the viewpoint. • Ingress/egress fuelbreaks would not be visible from the scenic road and likely not discernible from the viewpoint. • New disclines would not be visible from the scenic road and not likely discernible from the scenic viewpoint. • Potential FRAs may be visible in the foreground along Stevens Creek Tony Look Trail.	• Impacts of the fuelbreaks on the scenic vista may be significant and unavoidable even after mitigation. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
La Honda OSP	• Scenic road (Highway 84 and Highway 35) • Scenic corridors around Highway 84 and Highway 35 • Scenic viewpoints (5 viewpoints)	• Fuelbreaks (shaded and non-shaded) • Ingress/egress fuelbreaks • Fuelbreaks around staging and helicopter landing areas and tanks • Disclines	• Fuelbreaks, both shaded and non-shaded are visible from scenic roads (Highway 84 and Highway 35) and their scenic corridors and from scenic viewpoints.	• Impacts from shaded and non-shaded fuelbreaks along the scenic roads and corridors may be a significant and unavoidable impact even after mitigation.

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
		• Eucalyptus/acacia removal areas • Potential FRAs	• Ingress/egress fuelbreaks are not likely visible or discernible from scenic viewpoints. • Fuelbreaks around staging and helicopter landing areas and tanks may be visible from scenic viewpoints and scenic roads (Highway 84) and corridors but due to the small size and existing infrastructure visual change would be low and viewing time brief. • Disclines not likely visible from scenic areas. • Eucalyptus/acacia removal areas visible from scenic road (Highway 84). • Potential FRAs generally would not be visible from scenic roads and corridors as the FRAs are beyond the fuelbreaks adjacent to the roads.	• Eucalyptus/acacia removal may be a significant and unavoidable impact from a scenic road (Highway 84) and corridor. **Mitigation** MM Aesthetics-1
Long Ridge OSP	• Scenic road (Highway 35) • Scenic trails • Scenic corridors around Highway 35 and Highway 9 • Scenic viewpoints (5 viewpoints)	• Fuelbreaks around evacuation routes • Fuelbreaks around helicopter landing areas • Potential FRAs	• Fuelbreaks are visible from scenic viewpoints, scenic road (Highway 35), scenic corridor around Highway 35 and Highway 9, and from scenic trails. • Fuelbreaks around helicopter landing areas are visible from scenic trails but due to the small size and existing infrastructure	• Impacts from fuelbreaks along the scenic routes and corridors may be a significant and unavoidable impact even after mitigation. **Mitigation** MM Aesthetics-1

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
			visual change would be low and viewing time brief. • Potential FRAs generally would not be visible from scenic roads, corridors, and trails as the FRAs are beyond the fuelbreaks adjacent to the roads.	
Los Trancos OSP	• Scenic road (Page Mill Road) • Scenic viewpoint	• Fuelbreaks • Potential FRAs	• Up to 200-foot fuelbreaks would be visible from scenic road (Page Mill Road) and scenic viewpoint. • Potential FRAs generally would not be visible from scenic roads, corridors, and trails as the FRAs are beyond the fuelbreaks adjacent to the roads.	• Impacts from fuelbreaks along the scenic road, Page Mill Road, and viewpoint may be a significant and unavoidable impact even after mitigation. **Mitigation** MM Aesthetics-1
Miramontes OSP	• Scenic road (Miramontes St) • Scenic corridors around Highway 92 and Highway 35 • Scenic viewpoint	• Fuelbreaks around Highway 35 and Miramontes St • Eucalyptus and acacia removal • Ingress/egress fuelbreaks	• Up to 200-foot fuelbreaks would be visible from scenic road (Miramontes St), scenic corridor around Highway 35, and scenic viewpoint. • Eucalyptus and acacia removal, ingress/egress fuelbreaks are visible from a scenic road (Miramontes St) and scenic corridor around Highway 92.	• Impacts from fuelbreaks along scenic road (Miramontes St), scenic corridor around Highway 35, and scenic viewpoint may be a significant and unavoidable impact even after mitigation. • Eucalyptus/acacia removal may be a significant and unavoidable impact from a scenic road (Miramontes St) and scenic corridor around Highway 92. **Mitigation** MM Aesthetics-1

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
Monte Bello OSP	• Scenic road (Highway 35 and Monte Bello Road) • Scenic trail • Scenic viewpoints (3 viewpoints)	• Fuelbreaks • Fuelbreaks around water tanks, helicopter landing areas, and evacuation routes • Ingress/egress fuelbreaks • Potential FRAs	• Up to 200-foot fuelbreaks are visible from scenic roads (Highway 35 and Monte Bello Road), scenic trails, and scenic viewpoints. • Fuelbreaks around helicopter landing areas and water tanks would not be readily visible from the scenic road. • Ingress/egress fuelbreaks would be visible from viewpoints but due to small size would not be significant but may be visible in the foreground of the scenic trail. • Potential FRAs generally would not be visible from scenic roads, corridors, and trails as the FRAs are beyond the fuelbreaks adjacent to the roads.	• Impacts from fuelbreaks along scenic roads (Highway 35 and Monte Bello Road) and their corridors and viewpoints may be a significant and unavoidable impact even after mitigation. • Impacts from ingress/egress fuelbreaks on scenic trails may be a significant and unavoidable impact even after mitigation. **Mitigation** MM Aesthetics-1
Picchetti Ranch OSP	• Scenic road (Steven Canyon Road and Monte Bello Road) • Scenic viewpoint	• Fuelbreaks • Fuelbreaks around helicopter landing areas • Potential FRAs	• Up to 200-foot fuelbreak around evacuation routes and helicopter landing areas are visible form scenic road (Steven Canyon Road and Monte Bello Road). Potential visibility from the viewpoint. • Potential FRAs generally would not be visible from scenic roads, corridors, and trails as the FRAs are beyond the fuelbreaks adjacent to the roads; FRAs may be visible from the scenic viewpoint but due to the lower	• Impacts from fuelbreaks along scenic roads (Steven Canyon Road and Monte Bello Road) may be a significant and unavoidable impact even after mitigation. **Mitigation** MM Aesthetics-1

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
			intensity of vegetation removal visual impacts would not be significant from the viewpoint.	
Pulgas Ridge OSP	• Scenic corridor around Highway 280 • Scenic trail	• Fuelbreaks around communication, and helicopter landing area • Fuelbreak shaded • Fuelbreak agency recommended • Eucalyptus and acacia removal • Potential FRAs	• An up to 200-foot fuelbreak around the Highway 280 exit would have limited visibility from 280 due to its small size and short duration of views from Highway 280. Impacts would be less than significant. • Fuelbreak around communication and helicopter landing area would be limited due to their small size and vehicle speeds on Highway 280. • Shaded fuelbreak would be visible along the scenic trail. • Eucalyptus and acacia removal would be substantial and highly visible along the scenic trail. • FRAs may be visible along the scenic trail.	• Impacts from fuelbreaks along a scenic trail maybe be a significant and unavoidable impact even after mitigation. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Purisima Creek Redwoods OSP	• Scenic corridors around Purisima Creek Road, Higgins Canyon Road, and Tunitas Creek Road • Scenic road (Highway 35 and Tunitas Creek Road) • Scenic trails • Scenic viewpoint	• Fuelbreaks • Non-shaded fuelbreak • Ingress/egress fuelbreak • Eucalyptus and acacia removal • Potential FRAs	• Up to 200-foot fuelbreak around evacuation routes. • Non shaded fuelbreak visible from scenic road (Highway 35) but viewing time would be brief and impacts less than significant. • Ingress/egress fuelbreaks short and visibility from Highway 35 would be minimal due to limited visibility and viewer duration.	• Impacts from fuelbreaks along scenic roads (Highway 35 and Tunitas Creeks Road), scenic corridor around Purisima Creek Road, Higgins Canyon Road, and Tunitas Creek Road would be a significant and unavoidable impact even after mitigation.

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
			• Eucalyptus and acacia removal visible from scenic road. • FRAs are visible from scenic trails, and portions from scenic roads (Highway 35 and Tunitas Creek Road), scenic corridor around Purisima Creek Road, Higgins Canyon Road, and Tunitas Creek Road. Potential visibility for viewpoint (but less than significant from viewpoint).	• Eucalyptus and acacia removal from the scenic road may be significant and unavoidable even after mitigation. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Rancho San Antonio OSP and County Park	• Scenic road (Monte Bello Road) • Scenic trails • Scenic viewpoints (3 viewpoints)	• Fuelbreaks • Fuelbreaks around communication, helicopter landing area, staging areas, community center • New disclines • Potential FRAs	• 200-foot fuelbreaks are not located near any scenic viewpoints, roads, corridors, or trails. • Fuelbreaks around infrastructure may be visible from scenic trails but would be limited in size and around existing infrastructure. • A discline would be visible in the County Park but not from designated scenic areas. • Potential FRAs are visible from a scenic road (Monte Bello Road), scenic trails, and scenic viewpoints (although visibility from viewpoints would likely be less than significant).	• Impacts from FRAs would be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Ravenswood OSP	• Scenic viewpoint	None	None	None

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
Russian Ridge OSP	• Scenic corridors around Highway 35 and Alpine Road • Scenic road (Highway 35 and Alpine Road) • Scenic trails • Scenic viewpoints (2 viewpoints)	• Fuelbreaks • Fuelbreak (shaded) • Ingress/egress fuelbreaks • Potential FRAs	• Fuelbreaks visible along scenic Highway 35 and Alpine Road and associated scenic corridors and from scenic viewpoint. • Shaded fuelbreak visible along a scenic trail and from scenic viewpoint. • Ingress/egress visible along scenic trail and scenic viewpoint (although impacts from viewpoint would be less than significant). • FRAs visible from scenic trails. Visibility from scenic roads and corridors would be limited since the FRAs are beyond the fuelbreaks around these roads.	• Impacts from fuelbreaks visible from Highway 35 and Alpine Road may be significant and unavoidable even after mitigation. • Impacts from shaded fuelbreaks may be significant and unavoidable even after mitigation. • Impacts from ingress/egress may be significant and unavoidable as viewed from scenic trails. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Saratoga Gap OSP	• Scenic road (Highway 35, Highway 9 and Stevens Canyon Road) • Scenic viewpoints (2 viewpoints)	• Fuelbreaks • Potential FRAs	• Up to 200-foot fuelbreaks would be visible along scenic roads Highway 9 and Highway 35 and from a scenic viewpoint • Potential FRAs would not generally be visible from scenic roads since they would all be located beyond the fuelbreaks proposed around roads. FRAs may be visible from scenic viewpoints, but impacts would not be discernible.	• Impacts from fuelbreaks along scenic roads (Highway 35, Highway 9, and Stevens Canyon Road), scenic corridors and viewpoints would be a significant and unavoidable impact even after mitigation. **Mitigation** MM Aesthetics-1

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
Sierra Azul OSP and Easements	• Scenic road (Soda Springs Road, Mount Umunhum Road, Hicks Road, and Alamitos Road • Scenic trails • Scenic viewpoints (4 viewpoints)	• Fuelbreaks • Ingress/egress fuelbreaks • Fuelbreaks around helicopter landing areas • Eucalyptus and Acacia removal • Potential FRAs	• Up to 200-foot fuelbreaks visible along scenic roads and trails and from scenic viewpoints. • Ingres/egress fuelbreaks visible along scenic trails and scenic Hicks Road. • Fuelbreaks visible around helicopter landing and staging areas from scenic roads, but with limited extent and duration of visibility due to size and existing disturbance. • Area of eucalyptus/acacia removal visible from a scenic trail and viewpoint • FRAs visible from scenic corridor around Hicks Road, Reynolds Road, Mount Umunhum Road, scenic road (Soda Springs Road, Mount Umunhum Road, Hicks Road, and Alamitos Road), scenic trails, and scenic viewpoints, (but impacts would not be discernible from viewpoints).	• Impacts from fuelbreaks may be significant and unavoidable, even with mitigation. • Impacts from ingress/egress fuelbreaks may be significant and unavoidable, even with mitigation. • Impacts from eucalyptus/acacia removal may be significant and unavoidable, even with mitigation. • Impacts from FRAs may be significant and unavoidable, even with mitigation. **Mitigation** • MM Aesthetics-1
Skyline Ridge OSP	• Scenic corridors around Highway 35 and Alpine Road • Scenic road (Highway 35 and Aline Road) • Scenic viewpoint	• Fuelbreaks • Fuelbreaks around helicopter landing areas, and community center • Ingress/egress fuelbreaks • Potential FRAs	• Fuelbreaks are visible from scenic corridor around Highway 35 and Alpine Road, scenic roads (Highway 35 and Alpine Road), and scenic viewpoint.	• Impacts from fuelbreaks along scenic roads (Highway 35 and Alpine Road) and their scenic corridors may be a significant and unavoidable impact even after mitigation.

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
			• Fuelbreaks around helicopter landing areas and community center would not likely be visible from scenic roads, trails, corridors, or viewpoints. • Ingress/egress fuelbreaks would be visible from Highway 35 but would be within a wider fuelbreak and thus indistinguishable from the larger fuelbreak. • FRAs visible from scenic trails. Visibility from scenic roads and corridors would be limited since the FRAs are beyond the fuelbreaks around these roads. FRAs would be visible from the scenic viewpoint but likely an indiscernible change.	• Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
St. Joseph's Hill OSP	• Scenic Road (Highway 17) • Scenic trail • Scenic viewpoint	• Fuelbreaks around evacuation routes • Potential FRAs	• Fuelbreak would be visible from Highway 17 and scenic viewpoint but only briefly from vehicles. • FRAs would be visible from Highway 17 but only briefly from vehicles as a distance from the FRAs. FRAs would be visible from the scenic viewpoint but likely an indiscernible change.	None
Steven's Creek Shoreline Natural Study Area	None	None	None	None

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
Teague Hill OSP	• Scenic corridors around Kings Mountain Road and Highway 84	• Small fuelbreaks around the northeastern side of the OSP • Fire Agency recommended fuelbreaks • Potential FRAs	• Fuelbreaks, Fire Agency recommended area, and potential FRAs have the potential visibility from scenic corridors around Kings Mountain Road and Highway 84 but only briefly from vehicles.	None
Thornwood OSP	• Scenic corridor around Highway 84 • Scenic road (Highway 84)	• Fuelbreaks • Fuelbreak shaded • Potential FRAs	• Up to 200-foot fuelbreak around evacuation routes, shaded fuelbreaks visible from scenic corridor and road • FRAs are visible from scenic road (Highway 84) and its corridor.	• Impacts from fuelbreaks around evacuation routes and shaded fuelbreaks along scenic corridor around Highway 84 may be a significant and unavailable impact even with mitigation. • Impacts from FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1
Tunitas Creek OSP	• Scenic corridor around Highway 1 • Scenic viewpoint nearby • Scenic road (Tunitas Creek Road)	• Fuelbreaks • Fuelbreaks around water tanks • Eucalyptus and acacia removal	• Up to 200-foot fuelbreak around evacuation routes would be visible from scenic corridor around Highway 1 but only briefly from vehicles. Potential visibility from scenic viewpoint but vegetation varied that is would not be a major change. Fuelbreak around Tunitas Creek Road would be visible. • Fuelbreak around water tanks could be visible from scenic	• Impacts from fuelbreaks around Tunitas Creek Road may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1

Managed Land	Scenic Viewpoints, Roads, Trails or Corridors?[a]	Potential Treatment Type	Potential Visibility of Treatments	Significant Impacts
			corridor around Highway 1 but only briefly from vehicles. • Eucalyptus and acacia removal could be visible from scenic corridor around Highway 1 but only briefly from vehicles.	
Windy Hill OSP	• Scenic road (Highway 35 and Alpine Road) • Scenic trails • Scenic viewpoint	• Fuelbreaks around evacuation routes • Fuelbreak (shaded and non-shaded) • New discline • Potential FRAs	• Up to 200-foot fuelbreak around evacuation routes, shaded fuelbreak are visible from scenic trails and scenic road (Highway 35) • Non-shaded fuelbreaks and new disclines visible from scenic viewpoint and scenic road (Highway 35), and scenic trails. • Potential FRAs visible from scenic trails.	• Impacts from fuelbreaks around evacuation routes and shaded fuelbreaks along scenic road (Highway 35) wand scenic trails may be a significant and unavoidable impact even with mitigation • Impacts from new disclines and non-shaded fuelbreaks from a scenic viewpoint, Highway 35, and scenic trails may be significant and unavoidable even with mitigation • Impacts from new FRAs may be significant and unavoidable even with mitigation. **Mitigation** MM Aesthetics-1

Note:

[a] Major scenic viewpoints, roads, trails, and corridors are considered in this analysis. Other scenic resources may be designated by local cities. Midpen is required to adhere to all local regulations.

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Regrowth in areas with burn scars would occur in the following seasons. Prescribed burning of grassland and oak savanna communities would be planned with specific prescriptions for maximizing ecosystem benefits and minimizing impacts to native grass and forb species such that regrowth of desired native species would be apparent in the following seasons, lessening the significant unavoidable effect over time. Stands of coastal scrub and chaparral would appear blackened until regrowth occurs in subsequent seasons, but burning would not occur at intervals that would threaten type conversion of chaparral or mature shrub communities that could result in a longer or permanent visual impact. Forest communities and potentially riparian communities may be treated with prescribed fire in the understory, where burn scars could last longer but would be less visible outside of the area of the prescribed fire due to thicker overstory, and regrowth would occur in subsequent seasons, lessening significant impacts over time.

Visual impacts from prescribed burning, although temporarily significant, are consistent with RM Policy SA-2, "Maintain significant landscapes or features that were formerly maintained by natural processes," since fire is a natural process.

Wildland Fire Pre-Plan

New firefighting infrastructure may be installed or constructed to facilitate firefighter response, including new or expanded roads, water infrastructure, and staging and helicopter landing areas. Any new water infrastructure would typically be installed near existing infrastructure in areas closer to urban and suburban uses. Where feasible, new water infrastructure would be located along existing roads and structures and installed underground to minimize visual effects (RM Policy SA-1).

Short-term visual changes would involve presence of equipment and work crews to construct and install the infrastructure. Most infrastructure would only require small areas of clearance, such as for placement of a new water tank. New and widened roads may be constructed, which would involve grading and laying of gravel or composite. New roads and staging and landing zones would involve clearance of areas in the few hundred square feet to a few acres in size. New roads could be up to 12 feet wide. Dust plumes, areas cleared of vegetation, and exposed soil associated with construction and installation activities could be visible from roads and trails. Construction dust would be managed in accordance with BAAQMD BMPs to reduce impacts, as required by MM Air Quality-1. Installation of a new road, landing zone, or staging area could appear as a line or polygon of unvegetated land. These types of infrastructure in a remote or undeveloped part of Midpen land could contrast with the natural vegetation and landscape. The new infrastructure could be visible in the background from scenic vistas as well as in the foreground or background from scenic roads, corridors, or trails, resulting in a substantial change to the visual character of an area. Creation of a new landing zone or staging area could appear as unvegetated land. The degree of impact would depend upon the duration of the view, whereas from scenic roads or corridors visibility would likely be brief given the localized nature of the infrastructure, but from a scenic viewpoint or trail, visibility could be longer due to longer viewing time. Impacts, in limited areas, could be significant. MM Aesthetics-2 requires new roads, helicopter landing areas, and staging areas to be located in

areas that minimize visibility from scenic trails or viewpoints, and to minimize recontouring and cuts into hillsides. Mitigation would likely reduce impacts to less than significant in the majority of cases, but occasionally, it may not be possible to avoid placing an important new road, staging, or helicopter landing area adjacent to a scenic trail or viewpoint where it could degrade visual quality. Impacts, in those rare instances, may be significant and unavoidable.

	Significance Determination
Impact Aesthetics-2: Substantial damage to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.	**Significant and unavoidable**

State scenic highways are designated under the California State Scenic Highway Program managed by Caltrans. Scenic resources, including historic structures, unique rock outcroppings, and trees, are located throughout Midpen lands and in many cases are viewable from State scenic highways (predominantly, Highway 35). Several fuelbreaks are proposed adjacent to State scenic highways. The locations and impacts of construction of fuelbreaks and other VMAs in the vicinity of State scenic highways are identified in Table 4.2-2.

Prescribed Fire Plan

Prescribed burning would be implemented within Midpen lands to incorporate the natural fire regime back into the landscape, primarily for ecosystem health and resiliency. Prescribed broadcast burns may be conducted in areas where visibility from scenic viewpoints, trails, roads, and corridors would still be possible. Pre-treatment of a selected area would be conducted using mechanical methods, which could result in piles of cut vegetation for future pile burns or one- to six-foot-wide bands of cleared earth to serve as control lines, if none are present. Typically, existing features, including roads and trails, would be used as control lines. A prescribed burn typically would be conducted on 50 acres. Up to three burns could occur per year in different OSPs or managed lands. Visual impacts of conducting the prescribed burn, including from the presence of equipment to manage the burn, from construction of control lines, and from smoke were previously addressed under the Analysis of Tools and Techniques, and found to be less than significant.

Longer-term visual impacts from a prescribed burn would consist of burnt vegetation at ground level on areas as large as 50 acres each. The visual impacts would depend upon the vegetation community type, but in all cases visual effects are ephemeral, as part of former natural processes, and major changes to composition of the landscape would not occur with the appropriate precautions (refer to Section 4.4: Biological Resources). While the effects would diminish over time, because prescribed burns would change the density of vegetation and color of the landscape to dark gray/black, the burns could still significantly degrade the visual character or quality of public views of the treatment areas until successional vegetation reestablishes. Impacts would be significant and unavoidable in areas where the burn scars are visible from scenic roads, trails, viewpoints, or corridors until the areas grow back in.

Regrowth in areas with burn scars would occur in the following seasons. Prescribed burning of grassland and oak savanna communities would be planned with specific prescriptions for maximizing ecosystem benefits and minimizing impacts to native grass and forb species such that regrowth of desired native species would be apparent in the following seasons, lessening the significant unavoidable effect over time. Stands of coastal scrub and chaparral would appear blackened until regrowth occurs in subsequent seasons, but burning would not occur at intervals that would threaten type conversion of chaparral or mature shrub communities that could result in a longer or permanent visual impact. Forest communities and potentially riparian communities may be treated with prescribed fire in the understory, where burn scars could last longer but would be less visible outside of the area of the prescribed fire due to thicker overstory, and regrowth would occur in subsequent seasons, lessening significant impacts over time.

Visual impacts from prescribed burning, although temporarily significant, are consistent with RM Policy SA-2, "Maintain significant landscapes or features that were formerly maintained by natural processes," since fire is a natural process.

All requirements of the local or underlying jurisdiction would need to be met when designing and implementing fuelbreaks adjacent to State scenic highways, including obtaining tree removal permits, if applicable. Shaded fuelbreaks are typically used in forest settings whereby the tree canopy is thinned to reduce the potential for a crown fire to move through the canopy; larger trees are left in place. Because not all of the existing vegetation would be cleared, and large trees would remain within shaded fuel breaks, vividness, intactness, and unity of views would likely remain high. However, the density and composition of the vegetation could be considered a visual resource and thus thinning and alteration may be considered a significant impact. MM Aesthetics-1 would be implemented to assess and reduce visual impacts in State scenic highway corridors, but it may not be feasible to implement it in all areas. Impacts would remain significant an unavoidable in some areas. Prescribed burns would change the density of vegetation and color of the landscape to dark gray/black, the burns could still significantly degrade the visual character or quality of views from the State scenic highway until successional vegetation reestablishes. Impacts would be significant and unavoidable where clearly visible from a State scenic highway until the areas grow back in. Firefighting infrastructure (new or expanded roads, water infrastructure, and staging and helicopter landing areas) generally would not be installed within the viewshed of a State scenic highway. Where new infrastructure may be constructed in a scenic area viewable from a State scenic highway, the impact could be significant. MM Aesthetics-2 would be applicable. The measure reduces aesthetic impacts by requiring new roads, helicopter landing areas, and staging areas to be located in areas that minimize visibility from scenic trails or viewpoints, and to minimize recontouring and cuts into hillsides. Mitigation would likely reduce impacts to less than significant in the majority of cases, but occasionally, it may not be possible to avoid placing an important new road, staging, or helicopter landing area adjacent to a scenic trail or viewpoint where it could degrade visual quality. Impacts, in those rare instances, may be significant and unavoidable.

Impacts described here would similarly apply to any new land purchased or gifted to Midpen and added to the Program, where the new areas would include VMAs, areas of prescribed burning under the PFP, and/or new firefighting infrastructure that could be visible from scenic roads, corridors, trails, and viewpoints.

	Significance Determination
Impact Aesthetics-3: New source of substantial light or glare that would adversely affect day or nighttime views in the area.	**Less than significant**

Lighting is extremely limited on Midpen lands under existing conditions, with only some exterior lighting at residences and offices for safety. The major source of light and glare in the area of Midpen lands is from the dense urban cities. No permanent lighting would be added as part of the Program. Fire management activities on Midpen lands would be performed typically during the day and would not require artificial lighting. Some Program activities, such as installation of firefighting infrastructure, may occur in the early morning or evening, necessitating the use of temporary lighting during installation. The areas where firefighting infrastructure could be improved or installed would be in discrete locations, and the lighting used during construction would not be permanent. Glare from equipment needed to implement various Program activities is not anticipated. The firefighting infrastructure (such as water tank, helicopter landing zones, and staging areas) that may be installed would not be anticipated to be a source of glare. The specific infrastructure that may be installed and locations have not been identified to the same level of detail as the other proposed activities. Refer to Section 4.1.3: Scope of the Program EIR for information on the environmental review process that may need to be completed prior to construction and operation of any new firefighting infrastructure. Implementation of the proposed activities would not create a new source of substantial light or glare. The impact would be less than significant.

4.2.6 Mitigation Measures

MM Aesthetics-1: Reduction of Visual Impacts from Scenic Roads, Corridors, Trails, and Viewpoints from VMAs

- Midpen shall conduct a visual reconnaissance of any planned VMAs during the annual planning process, prior to implementation of the VMA. The reconnaissance shall only apply to VMAs, based on desktop review, that could have the potential to be visible from a designated scenic road, corridor, trail, or viewpoint.
- If Midpen identifies that a VMA would fall within an area with lengthy views from a scenic road, corridor, trail, or viewpoint (i.e., longer than a few minutes) of a proposed treatment area, and would degrade the view by changing the existing character or opening up a less scenic view, Midpen will, before implementation, identify any change in location or design (such as avoid areas or reduce degree of thinning) of the VMA to reduce impacts to scenic areas and public views.
- If no changes are available that would reduce impacts to public viewers and that could achieve the intended wildland fire risk reduction objectives of the proposed treatment, Midpen will thin and feather adjacent vegetation to break up the linear edges of treatment areas and strategically preserve vegetation at the edge of the treatment area to help screen public views and minimize the contrast between the treatment area and surrounding vegetation.

Applicable Location(s): Throughout Midpen lands.

Performance Standards and Timing:

- **Before Activity:** Conduct desktop review to determine visibility of VMAs, conduct visual reconnaissance where appropriate to avoid scenic viewpoints, where feasible. Modify design and locations, where possible.
- **During Activity:** N/A
- **After Activity:** N/A

MM Aesthetics-2: Guidelines for Design of Roads, Landing Zones, or Staging Areas

New roads, landing zones, and staging areas (firefighting infrastructure) shall be designed in accordance with the following guidelines, as feasible:

- Locate new firefighting infrastructure away from ridgelines.
- Maximize natural conditions of the area surrounding infrastructure (e.g., mowed grass cover versus hardened surface).
- Minimize recontouring of hills and natural topography.
- Minimize hillside cuts that run against the contours; follow contours to the greatest extent possible.
- Avoid large rocks and mature, healthy trees.

Applicable Location(s): Throughout Midpen lands.

Performance Standards and Timing:

- **Before Activity:** Design firefighting infrastructure to meet the guidelines.
- **During Activity:** N/A
- **After Activity:** N/A

MM Air Quality-1: Fugitive Dust Control Measures for Infrastructure Installation

See Section 4.3: Air Quality

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4.3 Air Quality

4.3.1 Introduction

This section addresses the existing air quality conditions within the Program area and presents an evaluation of the potential effects to air quality from implementation of the Program. The air-quality analysis is based on air-quality modeling and literature review. Modeling assumptions and calculations are provided in Appendix 4.3.

Comments related to air quality impacts were received during the public scoping period. A summary of these comments and the location where they are addressed in the air quality analysis are provided in Table 4.3-1.

Table 4.3-1 Air Quality Scoping Comments

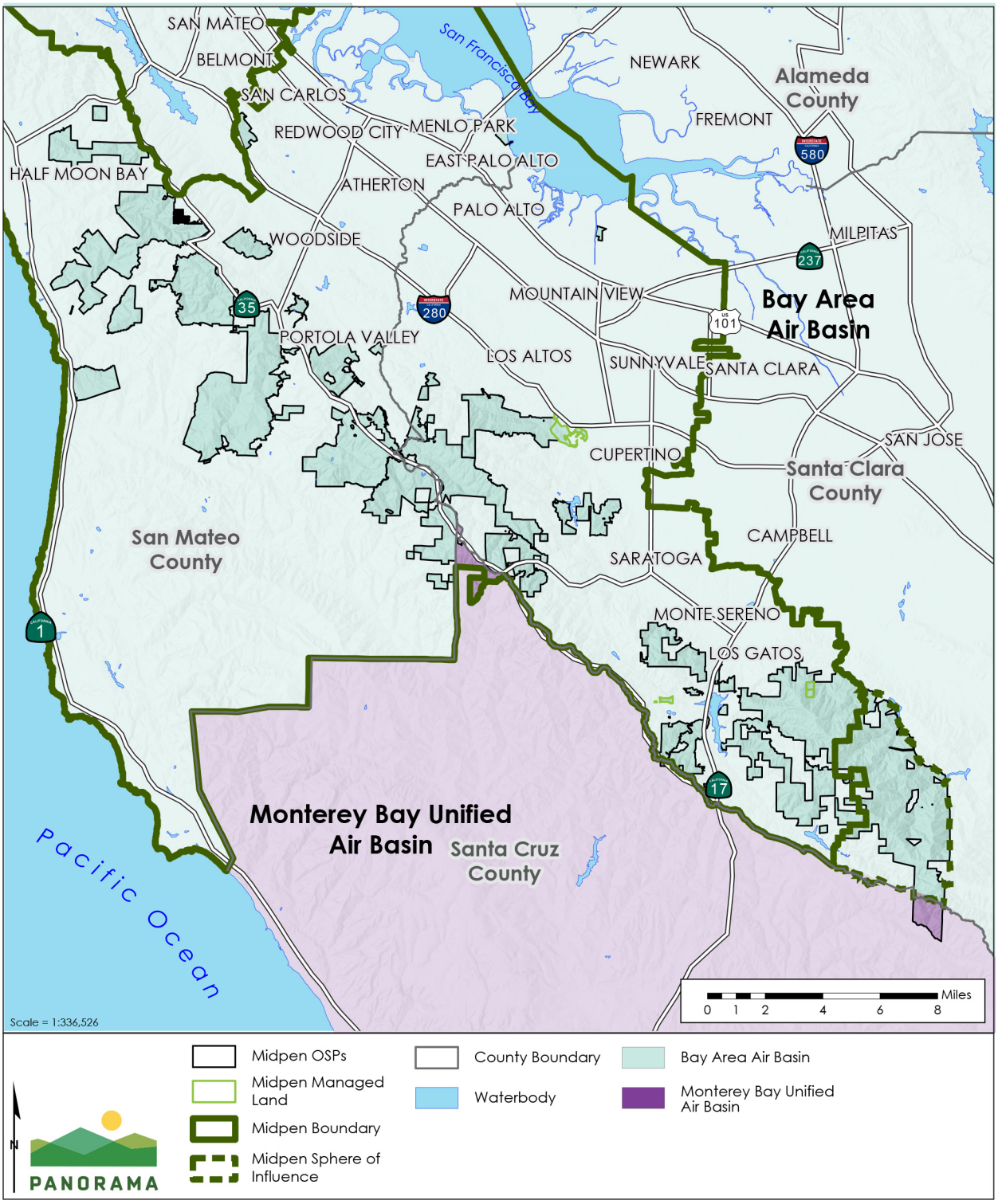
Summary of Comment	Location Addressed
How will air quality be evaluated and what equipment will be used?	Section 4.3.4: Impact Assessment Methodology Appendix 4.3
Describe reasoning for the use of past data as baseline conditions instead of current data to inform air quality impacts analysis.	Section 4.1.3: Scope of the Program EIR, Existing Environment
The EIR should study air quality impacts in relation to the current health pandemic and the impact of COVID-19 as a way to set a higher standard for air quality.	Section 4.1.3: Scope of the Program EIR, Existing Environment

4.3.2 Existing Environment

Air Basins

California is divided geographically into 15 air basins for the purpose of managing the air resources of the State on a regional basis. An air basin generally has similar meteorological and geographic conditions throughout. The portions of Midpen lands within San Mateo and Santa Clara counties are located in the San Francisco Bay Area Air Basin (SFBAAB), and portions within Santa Cruz County are in the North Central Coast Air Basin (NCCAB), as shown in Figure 4.3-1. The two air basins are distinct and face very different air pollution control problems. SFBAAB covers roughly 5,340 square miles and consists of Napa, Marin, San Francisco, Contra Costa, Alameda, San Mateo, and Santa Clara Counties, the southern portion of Sonoma County, and the western portion of Solano County. NCCAB comprises Monterey, Santa Cruz, and San Benito counties, covering an area of 5,159 square miles along the central coast of California. SFBAAB includes major urbanized areas, encompassing a population of about 7,000,000 in comparison to the NCCAB, which is primarily rural and mountainous, with a population of roughly 770,000 (U.S. Census Bureau, 2019).

Figure 4.3-1 Air Basins in the Area of Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; Teale Data Center GIS Lab; updated by California Air Resources Board, Planning and Technical Support Division, 2004)

Winds originating in the SFBAAB often transport pollutants into the NCCAB, which has a particularly strong influence on the NCCAB attainment status. The transport assessments for 1994 and 1995 indicate that 50 percent of NCCAB exceedances are the result of "overwhelming" transport from the SFBAAB, meaning that the exceedance would have occurred even with little or no emission contribution from the NCCAB (MBARD, 2017). While that assessment was performed over 25 years ago, the results are still applicable today. BAAQMD is the State regulatory body responsible for air-quality-related activities in the SFBAAB. The Monterey Bay Air Resources District (MBARD, formerly Monterey Bay Unified Air Pollution Control District) has jurisdiction over air-quality-related activities in the NCCAB. Approximately 97 percent of Midpen lands are located in SFBAAB, and the remaining three percent are located in NCCAB.

Climate, Meteorology, and Geography

Midpen lands are influenced by a Mediterranean climate comprising mild, wet winters and warm, dry summers cooled by cyclical coastal fog. During the winter, daily maximum temperatures average around 60 degrees Fahrenheit, and average minimum temperatures drop below 40 degrees Fahrenheit. Summer temperatures often exceed 85 degrees Fahrenheit, but much of the area also experiences low temperatures around the fifties due to summer fog. Precipitation in the area averages about 30 inches per year, with pronounced wet and dry seasons. Little or no rain falls from June through September, while about 80 percent of the annual total falls from November through March. Snow and freezing temperatures are rare within Midpen lands (WRCC, 2015).

The topography of the region causes complex patterns of fog, sun, and temperature throughout several microclimates. Higher elevations along the California Coast Ranges are influenced by the fog from the Pacific Ocean, while lower elevations in the Santa Clara Valley, guarded from the Pacific Ocean, are drier.

Air Pollutant Standards and Definitions

Overview

The U.S. Environmental Protection Agency (USEPA) has set air-pollutant emission standards to protect public health. USEPA has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter. Particulate-matter criteria pollutants are classified as either respirable particulate matter less than 10 micrometers in diameter (PM_{10}) or fine particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). CARB has set California Ambient Air Quality Standards (CAAQS) for four pollutants in addition to the six NAAQS criteria pollutants: sulfates, hydrogen sulfide (H_2S), vinyl chloride (C_2H_3Cl), and visibility reducing particles. Table 4.3-2 presents the NAAQS and CAAQS for the criteria air pollutants at different averaging periods as well as the primary and secondary standards for each. Primary standards are the levels of air quality necessary to protect public health with an adequate margin of safety. Secondary standards are the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

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Table 4.3-2 NAAQS and CAAQS for Criteria Air Pollutants

Pollutant	Averaging Time	CAAQS[a]	NAAQS[b]	
			Primary	Secondary
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hours	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3) [c]	0.070 ppm (137 µg/m^3) [c]
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3) [d]	–
	8 Hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3) [d]	–
NO_2	1 Hour	0.18 ppm (339 µg/m^3)	0.10 ppm (188 µg/m^3) [e]	–
	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3) [e]	0.053 ppm (100 µg/m^3)
SO_2	1 Hour	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
	3 Hours	–	–	0.5 ppm (1,300 µg/m^3)
	24 Hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3) [f]	–
	AAM	–	0.030 ppm (81 µg/m^3) [f]	–
Pb	30-Day Average	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3 [g]	1.5 µg/m^3 [g]
	Rolling 3-Month Average	–	0.15 µg/m^3	0.15 µg/m^3
PM_{10}	24 Hours	50 µg/m^3	150 µg/m^3 [h]	150 µg/m^3 [h]
	AAM	20 µg/m^3	–	–
$PM_{2.5}$	24 Hours	–	35 µg/m^3 [i]	35 µg/m^3 [i]
	AAM	12 µg/m^3	12.0 µg/m^3 [j]	15 µg/m^3 [j]
Sulfates	24 Hours	25 µg/m^3	–	–
H_2S	1 Hour	0.03 ppm (42 µg/m^3)	–	–

Pollutant	Averaging Time	CAAQS[a]	NAAQS[b]	
			Primary	Secondary
C_2H_3Cl	24 Hours	0.01 ppm (26 µg/m^3)	–	–
Visibility Reducing Particles	8 Hours	Extinction coefficient of 0.23 per kilometer	–	–

Notes:

[a] Pollutant concentrations should not exceed California standards for O_3, CO, SO_2 (1- and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility reducing particles. Pollutant concentrations shall not equal or exceed any other concentrations.

[b] Pollutant concentrations should not exceed national standards (other than O_3, particulate matter, and those based on AAM) more than once per year. Annual standards should never be exceeded.

[c] An area achieves the O_3 standard when the fourth-highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard.

[d] An area achieves the CO standard when fewer than two days are equal to or less than the standard.

[e] An area achieves the NO_2 standard when 98 percent of the 1-hour maximum concentrations, averaged over 3 years, are equal to or less than the standard.

[f] No areas of SO_2 nonattainment are located in California.

[g] Los Angeles County is the only area of Pb nonattainment in California.

[h] An area achieves the PM_{10} 24-hour standard when the expected number of days with a 24-hour average concentration greater than 150 µg/m^3 is equal to or less than 1 in any one calendar year.

[i] An area achieves the $PM_{2.5}$ 24-hour standard when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[j] An area achieves the $PM_{2.5}$ annual standard when the annual average concentrations, averaged over 3 years, are equal to or less than the standard.

AAM: annual arithmetic mean

mg/m^3: milligrams per cubic meter

µg/m^3: micrograms per cubic meter

ppb: parts per billion

ppm: parts per million

Source: (CARB, 2016)

Ozone

Ozone is found in the upper atmosphere (as the ozone layer) as well as at ground level. At ground level, ozone is considered a pollutant. Ozone forms when ozone precursors (e.g., reactive organic gases [ROGs], CO, or nitrogen oxides [NO_X]) react with sunlight in the atmosphere. Sources of these precursors include fuel combustion in vehicles and industrial processes, gasoline vapors, and chemical solvents. Ozone can cause respiratory problems (e.g., chest pain, coughing, or throat irritation) and exacerbate existing respiratory problems, such as asthma and bronchitis (USEPA, 2018a). Ozone is at the highest concentrations in summer. Ozone concentrations have steadily decreased in the Bay Area over the last three decades. Ozone one-hour NAAQS exceedances in SFBAAB occurred on 2 days in 2017 compared to 36 days in 1980 (CARB, 2018a). Ozone is the main pollutant of concern for the NCCAB; however, ozone concentrations have also been steadily decreasing over the last three decades. Ozone 8-hour CAAQS exceedances in the NCCAB occurred on 1 day in 2018 compared to 32 days in 1980 (CARB, 2018b).

Carbon Monoxide

Carbon monoxide (CO) is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest in the winter morning when surface-based inversions trap the pollutant at ground level. CO is emitted directly from internal combustion engines. The primary source of CO in urban areas is from motor vehicles. This being the case, higher concentrations of CO are found along transportation corridors. Exposure to CO results in reduced oxygen-carrying capacity of the blood. High CO concentrations can result in health risks, particularly for individuals with compromised cardiovascular systems (USEPA, 2018b). BAAQMD air pollutant monitoring data indicate that CO levels have been at healthy levels (i.e., below state and federal standards) in SFBAAB since the early 1990s. As a result, the region was re-designated as attainment for the CO standard in the late 1990s (CARB, 2004). The highest measured level of CO over any 8-hour averaging period in SFBAAB during recent years has been less than 3.0 ppm, compared to the federal and State ambient air-quality standard of 9.0 ppm (BAAQMD, 2018). NCCAB has been designated as attainment for CO levels since the early 1990s, and the highest measured level of CO over an 8-hour averaging period during recent years was less than 2.0 ppm (CARB, 2018b).

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is formed during combustion of fossil fuels from vehicles and industrial processes. NO_2 is an ozone precursor and can also cause acid rain and acid snow. Health effects of NO_2 include airway inflammation in healthy people and exacerbation of preexisting asthma (USEPA, 2018a). Nitrogen dioxide concentrations in SFBAAB have significantly reduced since 1990, primarily due to stringent emission controls for on-road vehicles (BAAQMD, 2017a). Nitrogen dioxide levels in NCCAB have also been decreasing since 1990, with a highest measured level of 0.047 ppm in 2018 compared to 0.07 ppm in 1989 (CARB, 2018b).

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless, acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal, and diesel. SO_2 has the potential to

damage building materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease. SO_2 is a precursor to the formation of atmospheric sulfate and particulate matter and contributes to potential atmospheric sulfuric acid formation that can precipitate downwind as acid rain (USEPA, 2018a). Daily SO_2 concentrations in both the SFBAAB and NCCAB have not exceeded any ambient air-quality standard in the last 30 years (BAAQMD, 2018; CARB, 2018b).

Lead

Lead has a range of adverse neurotoxin health effects and was formerly released into the atmosphere primarily via leaded gasoline products. The phase-out of leaded gasoline in California resulted in decreasing levels of atmospheric lead. Most aviation gasoline (general aviation fuel for piston engines) also contains lead. Lead is a highly stable compound that accumulates in the environment and in living organisms. In humans, lead exposures can interfere with the maturation and development of red blood cells, affect liver and kidney functions, and cause nervous system damage (CARB, 2020a). Lead is considered by CARB to be a toxic air contaminant. Any level of lead exposure has adverse health effects. BAAQMD monitors lead emissions from industrial operations through the toxic air contaminant (TAC) reporting process. In SFBAAB, there are no sources of lead that could exceed the national ambient air-quality standard (BAAQMD, 2019a). MBARD monitors TACs in the NCCAB, and it has been designated as attainment for state and federal lead emissions designations since the 1990s (CARB, 2018c).

Respirable Particulate Matter

Particulate matter is a combination of liquid or solid particles suspended in the air. PM_{10} particles are smaller than 10 micrometers in diameter and typically include dust, pollen, and mold. Liquid particles include those from sprays and other toxic chemical compounds. PM_{10} particles are a threat to health because they can enter the lungs and are small enough that the respiratory system cannot naturally filter them out. PM_{10} can exacerbate asthma and bronchitis and potentially contribute to premature death (USEPA, 2018a). Annual PM_{10} concentrations in SFBAAB were reduced by approximately 50 percent from 1989 to 2011 (BAAQMD, 2012). Annual PM_{10} concentrations in NCCAB have fluctuated over the last three decades, peaking at 37 $\mu g/m^3$ in 1997, and have decreased to an annual average of 28.5 $\mu g/m^3$ in 2018 (CARB, 2018d).

Fine Particulate Matter

Particulate matter is a combination of liquid or solid particles suspended in the air. $PM_{2.5}$ particles are smaller than 2.5 micrometers in diameter and typically include combustion particles, organic compounds, and metal particles. $PM_{2.5}$ is considered more hazardous to human health than PM_{10} because it can contain a larger variety of dangerous components than PM_{10} and can travel farther into the lungs, potentially causing scarring of lung tissue and reduced lung capacity (USEPA, 2018a). In 2018, the SFBAAB was designated as nonattainment for state and federal $PM_{2.5}$ ambient air-quality standards. As of 2018, fine particulate matter concentrations met the state and federal standards in the NCCAB (CARB, 2018c).

Existing Air-Quality Conditions

USEPA and CARB designate areas based on the attainment status for air-quality standards (NAAQS or CAAQS). Attainment areas meet or exceed ambient air-quality standards, and nonattainment areas do not. Nonattainment areas are sometimes classified by degree of underperformance (i.e., marginal, moderate, serious, severe, and extreme). If there is insufficient air-quality monitoring data for USEPA or CARB to determine the status and support a classification, the area is unclassified. It is generally assumed that unclassified areas are meeting the ambient air-quality standard. Table 4.3-3 lists USEPA and CARB attainment designations by pollutant for SFBAAB and NCCAB.

Table 4.3-3 Air Basin Designations

Pollutant	SFBAAB		NCCAB	
	USEPA Designation	CARB Designation	USEPA Designation	CARB Designation
O_3	N – Marginal	N	A	N – Transitional
CO	A	A	A	A
NO_2	A	A	A	A
SO_2	A	A	A	A
Pb	A	A	A	A
PM_{10}	U	N	A	N
$PM_{2.5}$	N	N	A	A
Sulfates	N/A	A	N/A	A
H_2S	N/A	U	N/A	U
Visibility Reducing Particles	N/A	U	N/A	U

Notes:
A – Attainment
N – Nonattainment
U – Unclassified
N/A – Not Applicable

Source: (CARB, 2018c)

Toxic Air Contaminants

Health Effects

TACs (also referred to as hazardous air pollutants or air toxics) are a broad class of compounds known to have the potential to cause morbidity or mortality (e.g., have carcinogenic qualities). TACs are substances that are identified by the California Environmental Protection Agency (CalEPA), listed in Title 17, CCR, § 93000as air pollutants that may pose a present or potential hazard to human health. TACs can cause long-term health effects, including but not limited to

cancer, asthma, and neurological damage as well as short-term health effects, including but not limited to eye watering and headaches. Diesel exhaust is the predominant TAC in urban air and is estimated to contribute more than 85 percent of the total inventoried cancer risk in SFBAAB (BAAQMD, 2014). Diesel exhaust is a complex mixture of gases, vapors, and fine particles. Some of the gaseous components of diesel exhaust, such as benzene, formaldehyde, and 1,3-butadiene, are suspected or known to cause cancer in humans. Diesel particulate matter in exhaust mainly comprises aggregates of spherical carbon particles coated with inorganic and organic substances (CARB, 1998).

Prescribed burns also result in the release of TAC emissions, primarily respirable and fine particulate matter, acrolein, and formaldehyde. Polycyclic aromatic hydrocarbons (PAHs), a component of respirable particulate matter, encompass many types of compounds and include benzene. TACs emitted from prescribed burns are listed on CARBs Contaminant Identification List (CARB, 2011). Prescribed burns also emit high levels of CO. Firefighters or Midpen employees or contractors working in close proximity to prescribed burns may experience short-term effects of smoke exposure, such as stinging, watery eyes, coughing, and runny noses. Additional effects include shortness of breath, headaches, dizziness, and nausea. Longer-term effects last from days to months and include losses of pulmonary function, such as diminished capacity to breathe, constriction of the respiratory tract, and hypersensitivity of small airways (Reinhardt, Ottmar, & Hanneman, 2000). PAHs are carcinogenic and have been linked to lung and bladder cancer (Robinson, et al., 2008).

Sensitive Receptors

BAAQMD defines sensitive receptors as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses (BAAQMD, 2017b). Sensitive receptors can be categorized as follows:

- Residences (e.g., houses, apartments, retirement homes)
- Active recreational land uses (e.g., sports fields)
- Medical facilities (e.g., hospitals, long-term health care facilities)
- Eldercare facilities (e.g., convalescent homes)
- Schools and playgrounds
- Childcare centers

Sensitive receptors have varying degrees of sensitivity to TACs. Residential areas are sensitive to poor air quality because people are often at home for extended periods. Active recreational land uses have a moderate sensitivity because vigorous exercise places a high demand on respiratory function. Some receptors are considered more sensitive to air pollutants than others because of pre-existing health problems, age, proximity to an emissions source, or duration of exposure to air pollutants. Facilities and land uses that support populations with a relatively high sensitivity to poor air quality include schools, childcare centers, playgrounds, hospitals, and convalescent homes because children, the elderly, and the sick are more susceptible to respiratory infections and other air-quality related health problems than the general public.

Children under 16 years are more susceptible to carcinogens compared to adults. This being the case, childcare centers and schools are considered the highest-risk sensitive receptors. BAAQMD recommends identifying sensitive receptors generally within 1,000 feet of a project site (BAAQMD, 2017b). Active recreationalists are not considered sensitive receptors because of their mobility, which limits their exposure duration.

Sensitive Receptors Near Midpen Lands

Sensitive receptors on or adjacent to Midpen lands include occupied residences scattered in low-density development patterns, primarily along SR-35. Other nearby receptors adjacent to Midpen lands include assisted living facilities and schools. Sensitive receptors in and immediately surrounding Midpen lands are shown in Figure 4.3-2 and listed in Table 4.3-4.

Naturally Occurring Asbestos

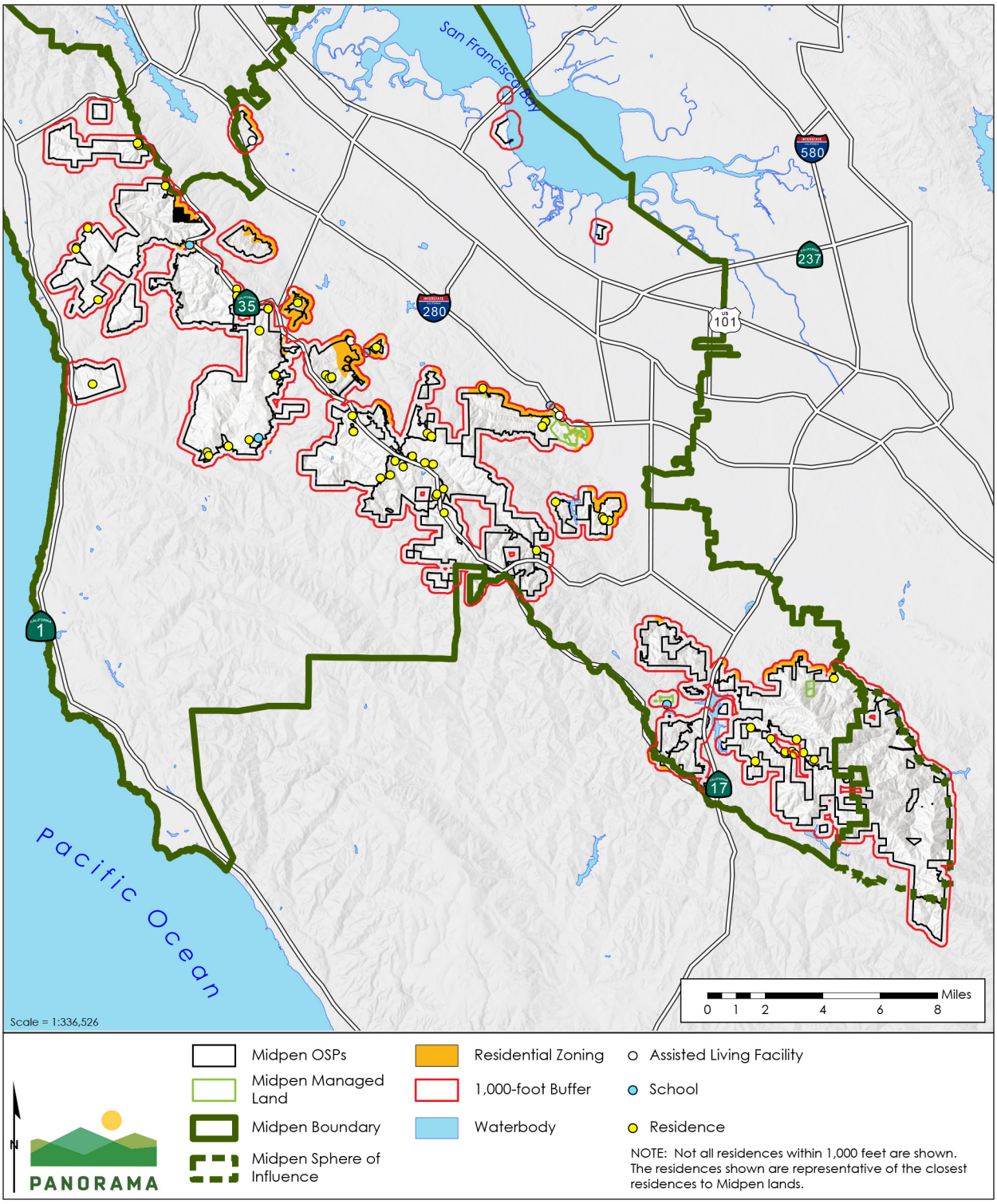
Asbestos is a group of naturally occurring fibrous minerals that were commonly used from the mid-1940s to the mid-1980s in building materials because of their high tensile strength and flexibility as well as fire-retardant properties. Asbestos was identified by CARB as a TAC and is classified as a known human carcinogen by State, federal, and international agencies (CARB, 2011). Inhaled asbestos dust in any quantity can contribute to eventual severe health problems such as mesothelioma and other cancers (WHO, 2012). Due to the historical widespread use of asbestos in household and industrial products, individuals living in the U.S. have potentially been exposed to asbestos (NTP, 2016).

Six mineral types that have asbestiform habit (long thin hair-like fiber) include those from the chrysotile (serpentinite) and amphibole. Asbestos is released from these minerals when broken or crushed. Serpentine rocks can be crushed when cars drive over unpaved roads or driveways that are surfaced with these rocks, when land is graded, or naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and remain in the air for extended periods of time. Midpen lands contain areas with serpentine rock units mapped as likely to contain natural occurrences of asbestos. Serpentine soils broken down from serpentine rocks can also contain naturally occurring asbestos. Locations where serpentinite rock forms are found on Midpen lands are shown in Figure 4.6-2, in Section 4.6: Geology and Soils.

Table 4.3-4 Sensitive Receptors Near or Within Midpen Lands

Sensitive Receptor	Approximate Distance to Midpen Lands Boundary	
Residential		
Residences internal to OSPs	El Corte de Madera Creek OSP	Rancho San Antonio OSP
	Fremont Older OSP	Russian Ridge OSP
	La Honda Creek OSP	Saratoga Gap OSP
	Long Ridge OSP	Sierra Azul OSP
	Miramontes OSP	Skyline Ridge OSP
	Monte Bello OSP	Thornewood OSP
	Picchetti Ranch OSP	Tunitas Creek OSP
	Purisima Creek Redwoods OSP	Windy Hill OSP
Nearest residential areas outside OSPs	45 feet from Miramontes Ridge OSP	
	60 feet from Sierra Azul OSP	
	120 feet from Monte Bello OSP	
	130 feet from Los Trancos OSP	
	280 feet from Windy Hill OSP	
	330 feet from El Corte de Madera	
Assisted-Living Facility		
The Sequoias	Adjacent to Windy Hill OSP	
Cordilleras County Mental Health Facility	270 feet from Pulgas Ridge OSP	
St Joseph Seminary	200 feet from Rancho San Antonio OSP	
The Forum at Rancho San Antonio	790 feet from Rancho San Antonio OSP	
Schools		
Corte Madera School	960 feet from Windy Hill OSP	
Eastbrook Elementary School	1,000 feet from Rancho San Antonio OSP	
Kings Mountain Elementary School	540 feet from Purisima Creek Redwoods OSP	
La Honda Elementary School	160 feet from La Honda Creek OSP	
Lakeside Elementary School	700 feet from Felton Station	

Figure 4.3-2 Sensitive Receptors Near or Within Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; Midpen, 2018)

4.3.3 Regulatory Setting

Federal

United States Environmental Protection Agency – National Ambient Air Quality Standards
USEPA is responsible for enforcing the federal Clean Air Act (CAA) and the 1990 amendments. The NAAQS, as previously discussed, were established by the federal CAA of 1970 and amended in 1977 and 1990. The ambient air-quality standards are prescribed levels of pollutants that represent safe levels that avoid specific adverse health effects associated with each pollutant. Table 4.3-2 presents the NAAQS for the criteria air pollutants at different averaging periods.

As part of its enforcement responsibilities, the USEPA requires each state with non-attainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution in non-attainment areas, using a combination of performance standards and market-based programs. The Program activities must comply with the thresholds set by the local air district, which are intended to meet NAAQS and achieve the goals of the SIP.

Occupational Safety and Health Administration
The Occupational Safety and Health Administration (OSHA) was established in 1971 under the Occupational Safety and Health Act to assure safe and healthy working conditions for employees by setting and enforcing standards. Federal worker safety and health regulations are regulated under the Federal Occupational Safety and Health Act (United States Code § 651 et seq.) and enforced by OSHA through regulations under Title 29 of the Code of Federal Regulations (CFR). Midpen employees or contractors that conduct activities as a part of the Program would be subject to these requirements.

State

California Air Resources Board – California Ambient Air Quality Standards
CARB oversees air-quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and regulating emissions from motor vehicles and consumer products within the state. CARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. CARB also sets fuel specifications to further reduce vehicular emissions and develops airborne toxic control measures to reduce TACs identified under CARB regulations. CARB oversees regional air district activities and regulates air quality at the State level.

Pursuant to the CCAA, CARB is responsible for setting CAAQS under California Health and Safety Code § 39606. The CAAQS, listed in Table 4.3-2 and previously discussed, are intended to protect public health, safety, and welfare.

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs, including diesel PM, and adopted EPA's list of Hazardous Air Pollutants as TACs.

The activities under the Program must comply with the thresholds set by the local air districts, which are intended to meet the CAAQS.

California Division of Occupational Safety and Health

The California Division of Occupational Safety and Health (Cal/OSHA) was established in 1973 by the California Occupational Safety and Health Act, with the goal of protecting public health and safety of the public in workplaces and other areas where the public may frequent. Cal/OSHA has established an extensive list of permissible exposure limits (PELs) and continues to update the PELs as new scientific data is published. Midpen has determined that an exceedance of Cal/OSHA's PELs would represent a significant impact on worker health during implementation of the Program.

California Code of Regulations – Title 17

California Code of Regulations (CCR) Title 17, Subchapter 2, Smoke Management Guidelines for Agricultural and Prescribed Burning, states that each air district in California shall adopt, implement and enforce a smoke management program consistent with the guidelines listed in Article 2. Each air district or region shall develop its smoke-management program in coordination with CARB, the appropriate fire-protection agencies, the land managers having jurisdiction within the district, any other affected parties, and the public. The smoke management programs should include a daily burn authorization system which specifies the amount, timing and location of each burn event, air-quality conditions, personnel that will be used to operate the burn program, and various additional procedures (CARB, 2019). Since the Program includes a prescribed burn element, these regulations would apply.

Regional and Local

Bay Area Air Quality Management District – Overview

BAAQMD attains and maintains air-quality conditions throughout the Program areas in San Mateo and Santa Clara Counties through comprehensive planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean-air strategy of BAAQMD includes the preparation of plans and programs for the attainment of ambient-air-quality standards, adoption and enforcement of rules and regulations, and issuance of permits for stationary sources. BAAQMD also inspects stationary sources, responds to citizen complaints, monitors ambient-air quality and meteorological conditions, and implements other programs and regulations required by the CAA and CCAA.

As mentioned above, BAAQMD adopts rules and regulations. All projects, including the Program, are subject to BAAQMD's rules and regulations in effect at the time of construction or implementation. Specific rules applicable to the activities under the Program or alternatives being considered may include, but are not limited to, the regulations listed below (BAAQMD, 2019b).

Bay Area Air Quality Management District – Regulation 5
Regulation 5, Open Burning, generally prohibits open burning but also allows for exemptions such as agricultural burning, disposal of hazardous materials, fire training, and range, forest, and wildlife management.

Bay Area Air Quality Management District – Regulation 6
Rule 1, General Requirements, limits the quantity of particulate matter in the atmosphere by controlling emission rates, concentration, visible emissions, and opacity.

Bay Area Air Quality Management District – Regulation 7
Regulation 7, Odorous Substances, places general limitations on odorous substances and specific emission limitations on certain odorous compounds. A person (or facility) must meet all limitations of this regulation, but meeting such limitations shall not exempt such person from any other requirements of BAAQMD, State, or national law.

Bay Area Air Quality Management District – Bay Area 2001 Ozone Attainment Plan
BAAQMD prepared the San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-Hour National Ozone Standard (2001 Ozone Attainment Plan) to reduce ozone-forming emissions in SFBAAB by implementing emissions-reductions measures for stationary, area, and mobile sources, such as reductions in off-gassing of architectural coatings and organic liquids, low-emission vehicles, expansion of express bus systems, and bicycle and pedestrian programs. The 2001 Ozone Attainment Plan was adopted on November 1, 2001 as a revision to the California SIP (BAAQMD, 2001). The 2001 Ozone Attainment Plan identified proposed control measures for stationary, area, and mobile sources to improve air quality and re-attain the national one-hour ozone standard in SFBAAB. BAAQMD does not have the jurisdiction to adopt mobile-source control measures. Mobile-source control measures were proposed for CARB to review and adopt as part of the California SIP.

Bay Area Air Quality Management District – 2017 Clean Air Plan
BAAQMD adopted the 2017 Clean Air Plan (CAP) to address state nonattainment in SFBAAB for both the one- and eight-hour ozone standards. The 2017 CAP details a control strategy to address ozone precursors (typically ROGs and NO_x), particulate matter, and TACs. The 85 control measures are categorized into nine economic sectors, including transportation, energy, agriculture, and natural and working lands (BAAQMD, 2017a). The 2017 CAP would apply to the Program.

Monterey Bay Air Resources District – Regulation IV, Rule 438
Rule 438, Open Outdoor Fires, codifies requirements and standards regarding the use of open outdoor fires (e.g., backyard burning, agricultural burning, prescribed burning, and

development burns) within the boundaries of the NCCAB. Rule 438 details general requirements, prohibitions, and smoke-management requirements for open outdoor fires. Since the Program includes the PFP, this regulation would apply to any prescribed burns within the NCCAB.

Monterey Bay Air Resources District – 2012-2015 Air Quality Management Plan
MBARD is required to develop an attainment plan to address ozone violations and periodically prepare and submit a report to CARB that assesses its progress toward attainment of the CAAQS. The 2012-2015 Air Quality Management Plan (AQMP) is the seventh update to the 1991 AQMP. The 2012–2015 AQMP shows that the region continues to make progress toward meeting the State ozone standard.

The 2012–2015 AQMP only addresses attainment of the State ozone standard. It is an assessment and update to the 2012 Triennial Plan. In 2012, the USEPA designated the NCCAB as in attainment with the eight-hour ozone NAAQS. In 2015, the NAAQS was revised to 0.070 ppm. The NCCAB continues to be in attainment with the stricter national standard (MBARD, 2017). Program activities within MBARD's jurisdiction are subject to the rules and regulations in the 2012–2015 AQMP and must comply with the State ozone attainment standards.

San Mateo County – General Plan
Midpen lands within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The San Mateo County General Plan Energy and Climate Change Element includes the following goals for air quality related to the Program (San Mateo County, 2013).

Goal 1 Promote and implement policies and programs to reduce community-wide greenhouse gas emissions.

Goal 5 Encourage the use of clean, low-emissions vehicles and equipment.

Santa Clara County – General Plan
Santa Clara County recently adopted a revision to the Health Element of the 1994 General Plan in August 2015, which includes the following strategies and policies for improving air quality within Santa Clara County (Santa Clara County, 2015). A large portion of the Program is in Santa Clara County, and this being the case, these policies would generally apply to the work.

HE-C.20 Greenhouse gases and air quality. The County shall promote plans and developments that reduce greenhouse gas emissions and result in decreased air pollution, especially for communities with disproportionate exposure to air pollution, and for vulnerable populations such as children, seniors, and those with respiratory illnesses.

HE-G.1 Air quality environmental review. The County shall continue to utilize and comply with the Air District's project- and plan-level thresholds of significance for air pollutants and greenhouse gas emissions.

HE-G.2 Coordination with regional agencies. The County shall coordinate with the Air District to promote and implement stationary and area source emission measures.

HE-G.4 Off-road sources. The County shall encourage mobile source emission reduction from off-road equipment such as construction, farming, lawn and garden, and recreational vehicles by retrofitting, retiring and replacing equipment and by using alternate fuel vehicles.

HE-G.6 Regional/local plans. The County shall encourage and support regional and local land use planning that reduces automobile use and promotes active transportation.

HE-G.7 Sensitive receptor uses. The County shall promote measures to protect sensitive receptor uses, such as residential areas, schools, day care centers, recreational playfields and trails, and medical facilities by locating sensitive receptor uses away from major roadways and stationary area sources of pollution, where possible, or incorporating feasible, effective mitigation measures.

Santa Cruz County – General Plan

Chapter 5, Conservation and Open Space, of the Santa Cruz County General Plan contains the following policies to achieve the goals to improve the air quality of Santa Cruz County (Santa Cruz County, 1994). A small portion of the Program is in Santa Cruz County and, this being the case, these policies would generally apply to the work.

5.18.2 **Non-Attainment Pollutants.** Prohibit any net increase in emissions of non-attainment pollutants or their precursors from new or modified stationary sources which emit 25 tons per year or more of such pollutants.

5.18.3 **Air Quality Mitigations.** Require land use projects generating high levels of air pollutants (i.e., manufacturing facilities, hazardous waste handling operations) to incorporate air quality mitigations in their design.

5.18.5 **Sensitive Land Uses.** Locate air pollution sensitive land uses, including hospitals, schools and care facilities, away from major sources of air pollution such as manufacturing, extracting facilities.

5.18.8 **Encouraging Landscaping.** Maintain vegetated and forested areas, and encourage cultivation of street trees and yard trees for their contributions to improved air quality.

4.3.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on air quality would be considered significant if they exceeded the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

(See CEQA Guidelines, Appendix G, I.)

Significance Thresholds

Criteria Air Pollutants

Midpen lands are located in areas under the jurisdiction of two air districts as shown in Figure 4.3-1. The majority of Midpen lands are located in SFBAAB, with a smaller portion within NCCAB. The attainment conditions and sources of air pollutants within each air basin differs. This being the case, the significance thresholds identified by each individual air district are used to determine whether the emissions generated by Program activities proposed to occur within each air basin would result in an exceedance. Program activities would be ongoing over many years and are considered operational.

BAAQMD released the 2017 Air Quality CEQA Guidelines,[1] which included thresholds of significance, in May 2017 to assist lead agencies in determining when air-quality emissions would be considered significant under CEQA. Based on the substantial technical research that went into the preparation of the thresholds by BAAQMD, this analysis uses the BAAQMD thresholds and the methodologies in its 2017 Air Quality CEQA Guidelines to determine the significance of the Program's impacts on air quality.

MBARD adopted the CEQA Air Quality Guidelines in 1995, with the latest updates in February 2016, which included thresholds of significance to assist lead agencies in determining when potential air-quality impacts would be considered significant under CEQA.

The thresholds of significance for criteria air pollutants are based on substantial evidence presented in Appendix D of the BAAQMD CEQA Air Quality Guidelines and BAAQMD's

[1] A subsequent update of BAAQMD's Air Quality CEQA Guidelines will be released to address outdated references, links, analytical methodologies or other technical information that may be in the 2017 Air Quality CEQA Guidelines or Thresholds Justification Report.

Revised Draft Options and Justification Report concerning CEQA thresholds (BAAQMD, 2017a; BAAQMD, 2009). MBARD recommends agencies use the significance thresholds as they were developed based on the offset requirements in MBARD's Rule 207 Review of New or Modified Sources (MBARD, 2016). Based on the substantial technical research that went into the preparation of the thresholds by BAAQMD and the justification of the MBARD thresholds, Midpen has elected to use the BAAQMD operational-related thresholds of significance for activities within SFBAAB as shown in Table 4.3-5 and the MBARD operational thresholds of significance for activities within NCCAB as shown in Table 4.3-6.

Table 4.3-5 BAAQMD Thresholds of Significance for SFBAAB

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Annual Average Emissions (tons/year)
ROG	54	54	10
NO_x	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
CO	Not Applicable	9.0 ppm (8-hour average) or 20.0 ppm (1-hour average)	
Fugitive Dust	Construction Dust Ordinance or other Best Management Practices	Not applicable	

Source: (BAAQMD, 2017b)

Table 4.3-6 MBARD Thresholds of Significance for NCCAB

Pollutant	Construction Thresholds	Operational Thresholds
	Maximum Daily Emissions (lbs/day)	Maximum Daily Emissions (lbs/day)
ROG (volatile organic compound)	--	137
NOx, as NO_2	--	137
PM_{10}	82	82
$PM_{2.5}$	55	55
CO	--	550
SOx, as SO_2	--	150

Notes:

Projects that emit other criteria pollutant emissions would have a significant impact if emissions would cause or substantially contribute to the violation of CAAQS and NAAQS.

Source: (MBARD, 2016)

Health Risk

For CO, PM_{10}, and TAC emissions, Midpen has determined that an exceedance of the most stringent and appropriate exposure limit, either Cal/OSHA's PELs or National Institute for Occupational Safety and Health (NIOSH) recommended exposure limits (RELs), shown in Table 4.3-7, would represent a significant impact on worker health. Exposure limits, either PELs or RELs, are exposure limits that cannot be exceeded for substances, such as chemicals, fumes, and vapors, that are hazardous to human health.

Table 4.3-7 Exposure Limits for Selected Contaminants

Air Contaminant	Cal/OSHA Permissible Exposure Limit			NIOSH Recommended Exposure Limit		
	TWA[a]	STEL	Ceiling	TWA[b]	STEL	Ceiling
Acrolein	-	-	0.1 ppm	0.1 ppm	3 ppm	-
Benzene	1 ppm	5 ppm	-	0.1 ppm	1 ppm	-
Carbon Monoxide	25 ppm	-	200 ppm	35 ppm	-	200 ppm
Formaldehyde	0.75 ppm	2 ppm	-	0.016 ppm	-	0.1 ppm[c]
Respirable Particulate Matter	5 mg/m^3	-	-	-	-	-

Notes:

The PELs established by OSHA were issued shortly after adoption of the Occupational Safety and Health Act and are outdated and inadequate (OSHA, 2017). This being the case, OSHA PELs are not considered as exposure limits.

[a] Time-weighted average exposure limit is for an 8-hour time period.

[b] Time-weighted average exposure limit is for up to a 10-hour time period.

[c] Over a 15-minute time period.

Source: (OSHA, 2016; CDC, 2016; Cal/OSHA, 2016)

Time-weighted averages (TWA) are exposure limits that represent the maximum level of exposure over the course of up to a 10-hour workday during a 40-hour work week. A short-term exposure limit (STEL) is a 15--minute TWA exposure that is not to be exceeded at any time during a workday. A ceiling exposure limit should not ever be exceeded.

Analysis Methodology

Overview

The analysis addresses impacts that could occur from implementation of the types of activities proposed as part of the Program, including manual and mechanical techniques, prescribed burning, prescribed herbivory, and other activities. Estimated emissions are then provided for a modeled maximum year of Program implementation (Maximum Year Conditions). Calculations and assumptions used to estimate equipment, vehicle, and burning emissions under Baseline Conditions and Maximum Year Conditions are provided in Appendix 4.3. The activities would occur annually for the life of the Program. This being the case, annual air-pollutant emissions are reported and compared against the BAAQMD annual-emissions threshold.

Establishing Baseline Conditions

Emissions from Equipment

The emissions calculations were assessed against the emissions currently generated under baseline conditions, which would comprise activities currently conducted on Midpen lands under the IPMP and other ongoing vegetation-management activities. Activity data for baseline conditions was formulated through a combination of activity information, a schedule of activities, and measurements taken from Geographic Information Systems (GIS) datasets provided by Midpen. The baseline-year activity data were used to determine emissions from equipment and vehicle use. Pollutant emissions were estimated based on the emission factors developed in the EMission FACtors 2017 (EMFAC2017) model and USEPA AP-42 methodologies. Off-road equipment emissions were estimated using the project activity data and emissions factors from CARB's 2017 Off-Road Emissions Inventory model (OFFROAD 2017). Vehicle-exhaust-emission factors (including running, evaporative, starting, idling, brake-wear, and tire-wear emissions) were derived based on modeling results from the EMFAC2017 model developed by the CARB (CARB, 2017).[2] Fugitive dust emissions from vehicles traveling on paved and unpaved roads were estimated based on the USEPA AP-42 methodologies (USEPA, 2006; USEPA, 2011). Emissions from use of a drip torch and propane torch were estimated using the USEPA AP-42 methodology (USEPA, 1996a; USEPA, 2008). Baseline conditions emissions of criteria pollutants from vehicle and equipment use are provided in Table 4.3-8.

Emissions from Burning

The Consume Model was developed by the U.S. Forest Service (USFS), Fire and Environmental Research Applications Team, in 2014. This model was used to estimate emissions from pile burning because there is no widely adopted method of calculating fuel loadings of piles in the other industry-accepted prescribed-burning model (First Order Fire Effects Model [FOFEM]). For the purposes of determining baseline conditions for pile burns, the permitted quantity from the fiscal year 2016 was used. Baseline conditions emissions of criteria pollutants from pile

[2] On September 19, 2019, the USEPA and the National Highway Traffic Safety Administration (NHTSA) enacted the "Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program," which they had proposed in 2018 to roll back corporate annual fuel economy standards issued during the Obama administration. The One National Program was immediately challenged in federal court. The day after it was issued, California's Attorney General, Xavier Bercerra, with 23 states and the District of Columbia, Los Angeles, and New York City, sued the Trump Administration, arguing that the "preemption rule" is "unlawful, disregards the National Environmental Policy Act and is arbitrary and capricious, among other complaints." Observers predict that the legal battle will go all the way to the Supreme Court, which means that the rule will be tied up in litigation for the next few years. Although CARB has issued EMFAC adjustment factors for gasoline light-duty vehicle emissions, these adjustment factors are very small (less than 1.2 percent by 2028). Despite the SAFE vehicles rule undergoing litigation, and since the adjustment factors are very small, the impact of the SAFE vehicles rule was accounted for quantitatively in this analysis.

burning in SFBAAB are provided in Table 4.3-8. No pile burning occurs under existing conditions on Midpen lands in NCCAB. No prescribed burning on Midpen lands occurs under existing conditions in either air basin.

Establishing Maximum Year Conditions

Overview

The maximum annual activities that could be implemented are described in Table 3-6 in Chapter 3: Project Description. The maximum annual activities were divided into each of the two air basins to determine associated emissions. Annual emissions in SFBAAB accounted for all activities that could occur, including prescribed burning, pile burning, manual and mechanical vegetation treatments, and installation of firefighting infrastructure. The significance thresholds for MBARD (i.e., NCCAB) are maximum daily. This being the case, emissions associated with three projected scenarios in NCCAB were calculated to determine which set of activities would yield the highest emissions. Scenario 1 is prescribed burning (50-acre grassland burn), scenario 2 is pile burning (burning of 14 tons of vegetation), and scenario 3 is new fuel treatments (creation of new VMAs by manual and mechanical methods).

Calculating Non-Burn Emissions

Air quality emissions resulting from implementation of the Program were calculated as the difference in emissions between baseline-conditions air-quality emissions and emissions generated in a maximum year of Program implementation. Pollutant emissions were estimated based on the emissions factors developed in the EMFAC2017 model, OFFROAD2017 model, and USEPA AP-42 methodologies, as previously described.

Table 4.3-8 Criteria Pollutant Emissions Generated During Baseline Conditions

Pollutant[a]	Vehicles and Equipment[b]	Pile Burn	Total Baseline Conditions Emissions
Annual Emissions in SFBAAB (Tons)			
PM_{10}	0.55	0.00	0.55
$PM_{2.5}$	0.08	0.00	0.08
NO_X	0.19	0.00	0.19
ROG	0.04	0.00	0.04
CO	2.84	0.02	2.86
Maximum Daily Emissions in NCCAB (Pounds/Day)			
PM_{10}	35.20	--	35.20
$PM_{2.5}$	4.72	--	4.72
NO_X	2.87	--	2.87
ROG	0.43	--	0.43
CO	22.82	--	22.82

Pollutant[a]	Vehicles and Equipment[b]	Pile Burn	Total Baseline Conditions Emissions
SOx	0.02	--	0.02

Notes:

Numbers may not add due to rounding.

[a] No prescribed burns are conducted under baseline conditions in SFBAAB or NCCAB, and no pile burns are conducted under baseline conditions in NCCAB.

[b] A control measure was incorporated to account for the required speed limit of 15 mph on unpaved roads (LU Regulations Section 500.1, MO Manual Section 07.005).

Calculating Burn Emissions

Prescribed Burns. The analysis of smoke emissions from prescribed burns was conducted using FOFEM. FOFEM was developed to predict smoke production from wildland fires, along with effects to soils and tree mortality from fires. FOFEM 6 is the most recent version of the model available. The model can be used to estimate emissions of $PM_{2.5}$, PM_{10}, CO, CO_2, NO_X, and CH_4 based on fuel volume of the vegetation burned and the moisture of the fuels when burned. FOFEM does not include a method for calculating ROG emissions. Applicable ROG emissions factors were used to estimate emissions from prescribed burning in various vegetation types (USEPA, 1996b; CARB, 2000).

CARB has a prescribed burning model available, known as the Emission Estimation System (EES) model, which is a GIS-linked program that automatically calculates the emissions using vegetation types as regionally mapped by CARB. The FOFEM model used in this analysis is the base model for EES but allowed the use of the detailed vegetation types on Midpen lands based on Midpen GIS, allowing for more accurate results than EES would have provided. Calculations and assumptions are provided in Appendix 4.3.

Pile Burns. Pile-burn emissions were calculated based on input from Midpen. The Consume model was also used to calculate emissions. The Consume model does not calculate NOx or SOx emissions, but applicable NOx and SOx emission factors were used to estimate emissions from pile burning (Urbanski, 2014). Calculations and assumptions are provided in Appendix 4.3.

4.3.5 Impact Analysis

	Significance Determination
Impact Air Quality-1: Conflict with or obstruct implementation of the applicable air-quality plan.	**Significant and unavoidable**

Overview

In determining consistency with the applicable air-quality plan, this analysis considers whether the Program would (1) support the primary goals of the plan, (2) include applicable control measures, if any, and (3) avoid disrupting or hindering implementation of control measures.

SFBAAB

The vast majority of the Program area falls within the SFBAAB (over 97 percent). The most recently adopted air-quality plan for the SFBAAB is the 2017 CAP. The primary goals of the 2017 CAP are to (1) protect public health by decreasing exposure to particulate matter and TACs as well as regional ROG, NOx, and $PM_{2.5}$ and (2) protect the climate by reducing GHG emissions. To meet the primary goals, the 2017 CAP recommends specific control measures and actions. These control measures are grouped into various categories that include stationary and area source measures, mobile source measures, transportation control measures, land use measures, and energy and climate measures. To this end, the 2017 CAP includes 85 control measures aimed at reducing air pollution in the SFBAAB. The measures most applicable to the Program are transportation control measures and energy and climate control measures. The Program's impact with respect to GHGs are discussed in Section 4.7: Greenhouse Gas Emissions.

Workers and contractors would commute to and from Midpen lands, and heavy equipment and vehicles would be used throughout Program implementation. The 2017 CAP includes several transportation control measures applicable to these activities, including the following:

- Provide incentives to promote ridesharing (TR8).
- Provide incentives to purchase new trucks that exceed NOx emission standards, hybrid trucks, or zero-emission trucks (TR19).
- Deploy construction and farm equipment with Tier III or IV off-road engines (TR22).

The applicable transportation control measures are voluntary incentive measures and do not require vehicle upgrades or retrofits. Midpen diesel-powered trucks and equipment already operate on renewable diesel. In accordance with Midpen's Climate Action Plan Actions V2 and V5, Midpen intends to investigate hybrid, electric, or alternative fuel trucks and conduct a pilot project on the viability of these trucks as well as replace administrative vehicles with electric or hybrid vehicles. Midpen intends to create incentives for employee commuting via carpool or other means per Action C4. These actions, which may occur during Program implementation, would be consistent with the listed control measures. The use of vehicles and equipment proposed as part of the Program would not conflict with these measures. This being the case, the Program would not conflict with or obstruct implementation of the control measures identified to achieve the goals of the 2017 CAP.

Vehicles and equipment used to implement the activities proposed under the Program would emit diesel particulate matter and criteria air pollutants. Earth-disturbing activities, such as during creation of control lines or installation of firefighting infrastructure, would generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. The majority of the particulate matter emissions in SFBAAB would be associated with prescribed burning, which is not an activity specifically covered by the 2017 CAP. As further discussed under Impact Air Quality-2, estimated emissions during implementation of the Program would exceed the numerical significance thresholds for particulate matter (PM_{10} and $PM_{2.5}$) and ozone precursors (NOx and ROG) prepared by BAAQMD, as shown in Table 4.3-9.

The Program would exceed the BAAQMD thresholds, which would conflict with the goals of the 2017 CAP, constituting a significant impact. MM Air Quality-1 would reduce the Program's contribution to fugitive dust emissions in nonattainment by requiring grading activities (e.g., for installation of a water tank) to use fugitive dust controls, in accordance with BAAQMD recommendations. Most of the emissions associated with the Program are from prescribed burning. A Smoke Management Plan must be prepared and implemented for each individual prescribed burn in accordance with and including all the restrictions required by BAAQMD's Regulation 5 and CCR Title 17, Subchapter 2, which would reduce some burn emissions by requiring adherence to seasonal and daily timing stipulations. Even with a Smoke Management Plan, emissions from prescribed burning may still exceed BAAQMD thresholds. MM Air Quality-2 requires Midpen to implement measures to minimize emissions associated with a prescribed burn, as feasible, including pre-treating the proposed burn area and burning when fuels have a higher moisture content. Mitigation would reduce impacts but would not bring Program emissions to below significance thresholds.

One of the objectives of the Program activities, including prescribed burning, is to minimize wildland fire risks. Annually, wildland fires represent a variable and not insignificant portion of particulate-matter emissions in SFBAAB as well as California as a whole (CARB, 2020b; CARB, 2013). Two to four times more fuel is consumed during a wildland fire compared to a prescribed fire (Ottmar, 2013). Studies have found that particulate-matter emission rates for wildland fires are much higher than for prescribed burns in the western United States (Liu, et al., 2017). The main reasons for this are that during a wildland fire, fuels are generally drier, tree crowns are typically ignited, and the ignition generally occurs during very windy periods. Modeling conducted in mixed conifer forests, found that for all air pollutants ignition of a wildland fire in an untreated area resulted in higher mean emissions compared to a prescribed fire conducted in or a wildland fire ignited in an area after mechanical fuel treatment (Hyde & Strand, 2019). Reducing wildland-fire hazards (by managing vegetation) is generally understood as correlating to lower overall particulate matter emissions over the long term if a wildland fire ignites. The Program would comply with strategies of the 2017 CAP but would exceed BAAQMD criteria pollutant thresholds identified to achieve the goals of the 2017 CAP, resulting in a significant and unavoidable impact.

NCCAB

Less than 3 percent of the total Program area falls within the NCCAB, including only small portions of Bear Creek Redwoods, Long Ridge, and Sierra Azul OSPs. The most recently adopted air-quality plan for the NCCAB is the 2012–2015 AQMP. The goal of the 2012–2015 AQMP is to document the progress toward achieving attainment of the ozone CAAQS and identify any needed and productive control measures. No new control measures are identified in the 2012-2015 AQMP, as none of the control measures feasible would result in productive reductions in ozone precursors. Vehicles and equipment used to implement the activities proposed under the Program would emit criteria air pollutants, including ozone precursors, should they occur in the area of Bear Creek Redwoods, Long Ridge, and Sierra Azul OSPs that falls within the NCCAB. The Program activity with the greatest emissions is prescribed

burning, which is not an activity specifically addressed by the 2012–2015 AQMP. As further discussed under Impact Air Quality-2, estimated emissions during implementation of the Program could exceed the numerical significance thresholds for ozone precursors (NOx and ROG) identified by MBARD from a prescribed burn (should it occur on the small portion of lands within the NCCAB), as shown in Table 4.3-9. Prescribed burns would be conducted in accordance with MBARD's Rule 438 requiring a smoke management plan and permit, which would minimize burn emissions.MM Air Quality-2 requires Midpen to implement measures to minimize emissions associated with a prescribed burn as feasible, including pre-treating the proposed burn area and burning when fuels have a higher moisture content. The Program could exceed MBARD criteria pollutant thresholds identified to achieve the goals of the 2012–2015 AQMP, resulting in a significant and unavoidable impact, should a prescribed burn be performed within the small areas of the three OSPs that lie within the NCCAB.

	Significance Determination
Impact Air Quality-2: Net increase of any criteria pollutant for which the Program region is non-attainment under an applicable federal or State ambient air-quality standard.	**Significant and unavoidable**

Program activities would involve use of a variety of tools and techniques including manual and mechanical methods, prescribed burning, and prescribed herbivory. Use of vehicles and equipment during these activities and to reach work areas would generate exhaust emissions. Fugitive dust would be generated from equipment and vehicle use on paved and unpaved roads and from ground-disturbing activities. Prescribed burning would emit particulate-matter emissions from combustion of vegetation. Use of hand tools and grazing livestock generally would not emit criteria air pollutants.

The estimated total air emissions that would be generated from all Program activities during a maximum implementation year are shown in Table 4.3-9. In SFBAAB, the threshold is based on annual net emissions and the annual net emissions of PM_{10}, $PM_{2.5}$ as well as ROG and NOx, precursors to ozone, from Program implementation would exceed the emissions thresholds.

The threshold in NCCAB is maximum daily emissions. The types of activities that could occur in NCCAB would vary but would likely be limited given the small proportion of the Program area that falls within the NCCAB (three percent). As such, three scenarios of potential peak daily activities were modeled. A summary of impacts by scenario in NCCAB are as follows:

- **Scenario 1, involving a prescribed burn of 50 acres of grassland in a grassland near Highway 35**
  - Resulted in the highest emissions of the activities that could be conducted in any one day in NCCAB.
  - Net maximum daily emissions of PM_{10}, $PM_{2.5}$, CO, and SOx as well as ROG and NOx, precursors to ozone, would exceed the emission thresholds.

- **Scenario 2, involving pile burning, and would include burning an average of 35 piles (14 tons) in one day along the two fuelbreaks that could fall within NCCAB in Long Ridge and a very small portion of Sierra Azul OSP**
  - Net maximum daily emissions of PM_{10} and $PM_{2.5}$ would exceed the emission thresholds.
- **Scenario 3, involving creation of new fuel treatments using manual and mechanical methods, focused primarily on two ingress-egress fuelbreaks that could fall within the NCCAB and some areas of FRAs**
  - No exceedances.

The emission exceedances would occur primarily due to prescribed burning activities, as summarized above, noting that prescribed burning may only occur once or twice in a few decades given the small portion of the Program area in the NCCAB. Implementation of the Program could result in the substantial generation of air pollutants. Prescribed burning could contribute considerably to regional particulate matter and ozone emissions that are in State and federal nonattainment. The impact would be potentially significant.

Midpen must prepare and implement a Smoke Management Plan for each individual prescribed burn in accordance with and including all the restrictions required by BAAQMD's Regulation 5 and CCR Title 17, Subchapter 2, which would reduce some burn emissions due to adhering to seasonal and daily timing stipulations, but would not reduce all emissions below levels of significance. Prescribed burns would be conducted in accordance with MBARD's Rule 438 requiring a smoke management plan and permit, which would also reduce some burn emissions. Studies conducted on emission rates from prescribed burning found that several techniques can be employed to minimize particulate matter emissions (NWCG, 2018). MM Air Quality-2 requires Midpen to implement one or more of these techniques, where appropriate, to minimize air pollutant emissions. Techniques include mechanically treating fuels before burning (pre-treatment), mosaic burning, and burning vegetation types with lower fuel loads that emit fewer air pollutants. MM Air Quality-2 could minimize emissions associated with prescribed burning but not to levels below the significance thresholds in SFBAAB or NCCAB. MM Air Quality-2 also requires Midpen to limit the tons of pile burning conducted in any one day to 8.8 tons (i.e., to not more than nine, 10-foot-square by 6-foot-high piles of shrub/hardwood vegetation or equivalent), which would ensure that maximum daily emissions under scenario 2 would not exceed thresholds as shown in Table 4.3-10, mitigating impacts from pile burning, should it occur in a small portion of Long Ridge OSP and very small portion of Sierra Azul OSP, to less than significant. The contribution to air-pollutant emissions in nonattainment in both air basins, caused primarily by prescribed burning, would remain significant and unavoidable with this mitigation.

The impact from generation of air pollutant emissions would be significant, but management of Midpen lands, including by prescribed burning, could result in some degree of long-term reduction in emissions of criteria air pollutants and precursors, should a wildland fire occur on Midpen's lands.

Table 4.3-9 Criteria Pollutant Emissions Generated During Baseline Conditions and the Maximum Year of Implementation

Pollutant	Total Baseline Conditions Emissions[a]	Maximum Year of Implementation						
		Vehicles and Equipment[b]	Prescribed Burn	Pile Burn	Total Program Emissions	Net Emissions	Applicable Significance Thresholds	Exceedance?
Annual Emissions in SFBAAB (Tons)								
PM_{10}	0.55	6.02	105.68	1.71	113.41	**113**	**15**	**Yes**
$PM_{2.5}$	0.08	1.20	89.57	1.49	92.26	**92**	**10**	**Yes**
NOx	0.19	3.12	7.63	0.44	11.18	**11**	**10**	**Yes**
ROG	0.04	0.96	47.60	0.50	49.06	**49**	**10**	**Yes**
CO	2.86	66.7	121.68	8.38	196.72	194	-	-
Maximum Daily Emissions in NCCAB (Pounds/Day) – Scenario 1 (A Prescribed Burn in 50 acres of Grasslands)								
PM_{10}	35.20	58.74	550.00	-	608.74	**574**	**82**	**Yes**
$PM_{2.5}$	4.72	8.81	550.00	-	558.81	**554**	**55**	**Yes**
NOx	2.87	8.17	600.00	-	608.17	**605**	**137**	**Yes**
ROG	0.43	1.85	963.00	-	964.85	**964**	**137**	**Yes**
CO	22.82	8.04	1,150.00	-	1,158.04	**1,135**	**550**	**Yes**
SOx	0.02	0.47	200.00	-	200.47	**200**	**150**	**Yes**
Maximum Daily Emissions in NCCAB (Pounds/Day) – Scenario 2 (Pile Burn, Assuming 35 Piles[d] Burned in One Day)								
PM_{10}	35.20	29.77	-	100.76	130.53	**95**	**82**	**Yes**
$PM_{2.5}$	4.72	4.15	-	87.76	91.90	**87**	**55**	**Yes**
NOx	2.87	1.26	-	26.00	27.26	24	137	No
ROG	0.43	0.40	-	29.42	29.82	29	137	No
CO	22.82	17.32	-	493.86	511.18	488	550	No
SOx	0.02	0.03	-	13.78	13.81	14	150	No

Pollutant	Total Baseline Conditions Emissions[a]	Maximum Year of Implementation				Net Emissions	Applicable Significance Thresholds	Exceedance?
		Vehicles and Equipment[b]	Prescribed Burn	Pile Burn	Total Program Emissions			
Maximum Daily Emissions in NCCAB (Pounds/Day) – Scenario 3 (New Fuel Treatments) [c]								
PM_{10}	35.20	36.24	-	-	36.24	1	82	No
$PM_{2.5}$	4.72	5.51	-	-	5.51	1	55	No
NOx	2.87	7.35	-	-	7.35	4	137	No
ROG	0.43	1.69	-	-	1.69	1	137	No
CO	22.82	113.61	-	-	113.61	91	550	No
SOx	0.02	0.03	-	-	0.03	0	150	No

Notes:

Bold indicates a value exceeds thresholds.

Numbers may not add due to rounding.

[a] No prescribed burns are conducted under baseline conditions in SFBAAB or NCCAB, and no pile burns are conducted under baseline conditions in NCCAB.

[b] A control measure was incorporated to account for the required speed limit of 15 mph on unpaved roads (LU Regulations Section 500.1, MO Manual Section 07.005).

[c] VMAs that may be created or maintained in NCCAB include fuelbreaks, defensible space, landing areas, and FRAs. New or improved firefighting infrastructure is not anticipated to be needed in the areas of Midpen lands within NCCAB.

[d] Assumes 10-foot-wide by six-foot-high parabolic piles of shrub/hardwood vegetation or equivalent.

Table 4.3-10 Criteria Pollutant Emissions Generated During Baseline Conditions and the Maximum Year of Implementation with Mitigation for Pile Burning in NCCAB

Pollutant	Total Baseline Conditions Emissions[a]	Maximum Year of Implementation						
		Vehicles and Equipment[b]	Prescribed Burn	Pile Burn	Total Program Emissions	Net Emissions	Significance Thresholds	Exceedance?
Maximum Daily Emissions in NCCAB (Pounds/Day) – Scenario 2 (Pile Burn, Assuming 22 Piles Burned)								
PM_{10}	35.20	18.71	-	63.33	82.04	47	82	No
$PM_{2.5}$	4.72	2.61	-	55.16	57.77	53	55	No
NOx	2.87	0.79	-	16.34	17.13	14	137	No
ROG	0.43	0.25	-	18.49	18.74	18	137	No
CO	22.82	10.89	-	310.43	321.31	299	550	No
SOx	0.02	0.03	-	8.66	8.68	8.66	150	No

Notes:

[a] Numbers may not add due to rounding.

New or improved firefighting infrastructure is not anticipated to be needed in the areas of Midpen lands within NCCAB.

[b] A control measure was incorporated to account for the required speed limit of 15 mph on unpaved roads (LU Regulations 500.1, MO Manual Section 07.005).

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Prescribed burning could potentially reduce the intensity of a wildland fire in the Program area, should one occur, could potentially limit wildland fire spread, and could slow the progress of a wildland fire to allow for more rapid containment. Wildland fires Statewide and in SFBAAB emit significantly greater criteria air pollutant emissions annually than non-agricultural prescribed burning (CARB, 2020c). Studies have found that particulate matter emission rates for wildland fires are more than two times higher than for prescribed burns in the western United States (Liu, et al., 2017).

A primary purpose of the Program is to reduce wildland fire risks. Emergency response for firefighting efforts requires mobilizing and deploying significant human and equipment resources. When wildland fires destroy structures, large volumes of debris are generated, which must be removed by haul trucks. This major surge in the use of on-road vehicles and off-road equipment during wildland fire response results in an increase of emissions also unaccounted for by the air-quality planning efforts of air districts. Wildland fire itself, through the combustion of vegetative and non-vegetative fuels, also results in increased and unforeseen emissions. Recent major wildland fires have created hazardous air-pollution conditions requiring health advisories and "spare the air" days far from the site of the fire. Wildland fires are generally far more likely to result in adverse air quality and public health impacts than prescribed burns.

Given the unpredictability of wildland fire, the variability in emission characteristics of wildland fire fuels (i.e., grass-type, shrub-type, tree-type, built structures), and the possible variability in emissions from treatment activities under the WFRP, evaluating the net effect of the WFRP on emissions associated with wildland fire and response is not possible, nor is it pertinent to determining the significance of the emissions from treatment activities under CEQA. This information is presented to explain the broader context for consideration of fire-related emissions, including both treatment emissions and wildland fire emissions as context for the finding of a significant unavoidable impact from prescribed burning.

	Significance Determination
Impact Air Quality-3: Exposure of sensitive human receptors to substantial pollutant concentrations.	**Significant and unavoidable**

Overview

Program activities would involve use of vehicles and equipment that could disturb serpentine soils, potentially exposing individuals to asbestos. Prescribed and pile burn activities would release smoke, which could expose workers, recreationalists, and the public to TAC emissions, including $PM_{2.5}$.

Average daily and annual emissions of particulate matter (PM_{10} and $PM_{2.5}$) and precursors to the formation of ozone (NOx and ROG), primarily due to prescribed burning, would exceed significance thresholds, resulting in a significant and unavoidable impact even with mitigation, as analyzed under Impact Air Quality-2. The recent *Sierra Club v. County of Fresno* California

Supreme Court case held, in part, that the Friant Ranch Specific Plan EIR was deficient in the informational discussion of air-quality impacts as they connect to adverse human-health effects. The Supreme Court concluded that an EIR's discussion must "make … a reasonable effort to substantively connect a project's air quality impacts to likely health consequences." The Program would contribute to regional particulate matter and ozone concentrations, but determining potential health impacts caused directly by the Program is not feasible.

According to the San Joaquin Valley Air Pollution Control District, it is not possible to determine ozone concentrations or make a direct correlation to human-health impacts because project-focused modeling cannot feasibly predict ozone formation and resulting regional ozone concentrations. Also, the current modeling tools are not equipped to provide meaningful analysis of the correlation between a project's criteria pollutant or pollutant precursor emissions and specific health impacts. Air-dispersion modeling is available, such as the American Meteorological Society/ Environmental Protection Agency Regulatory Model or Community Multiscale Air Quality, but these models cannot accurately estimate dispersion of ozone, which is a secondary pollutant derived from the oxidation of ROG and NOx. Ozone concentrations are dependent upon a variety of complex factors, including the presence of sunlight and precursor pollutants, natural topography, atmospheric stability, and wind patterns. Because of the dynamic nature of ozone formation and the complexities of predicting ground-level ozone concentrations in relation to ambient standards, air districts instead generally develop mass emissions thresholds for ROG and NOx that are used to make significance determinations.

In summary, modeling of the Program's ozone emissions is not feasible and would not provide meaningful information given the number of variables that affect ozone formation (e.g., location of activity and weather on that day that results in conversion of precursor emissions into ozone).

The estimated maximum particulate matter emissions, both PM_{10} and $PM_{2.5}$, would also exceed significance thresholds. $PM_{2.5}$ is smaller and would result in greater health effects. Impacts on the health of sensitive receptors related to particulate matter are analyzed with other TAC emissions associated with prescribed burning. Refer to Section 4.8: Hazards, Hazardous Materials, and Wildland Fire for a discussion of effects from chemical application on public health.

Analysis of Tools and Techniques

Asbestos

Manual and Mechanical Techniques, and Chemical Application

Any methods that do not disturb the ground surface, such as cutting of vegetation, application of chemicals, and propane flaming, would present no risk of disturbing and releasing naturally occurring asbestos and exposing workers. Pulling or removal of vegetation by the roots with heavy equipment and/or by hand could result in soil and ground disturbance that could cause asbestiform minerals to become airborne, which would pose a risk to workers if inhaled. Ground-disturbance could occur during several types of Program activities, including pre-treatment of an area prior to prescribed burning to install control lines, rehabilitation

following a burn, or installation of firefighting infrastructure. Mowing in serpentine soils could also result in the generation of dust if the mower head is set low enough to the ground that it generates dust plumes. Pile burns occur under existing conditions and would not involve the disturbance of ground that could result in exposure to naturally occurring asbestos.

Risk factors that can determine whether a worker develops an asbestos-related disease include dose, duration, type of asbestos fiber, source of exposure, individual sensitivity (e.g., smoking, asthma), and genetic factors (NCI, 2017). Amphibole asbestos fibers are retained in the lungs longer than chrysotile asbestos fibers. Serpentinite, a form of chrysotile asbestos, is considered to be less hazardous to health than amphibole forms of asbestos (ATSDR, 2001). Workers could be exposed to asbestos dust, which may be inhaled or coat their clothing. Risk of an asbestos-related disease would be limited due to the small potential to encounter serpentine soils and rock formations and would be less of a risk due to the type of asbestos present. The exposure to workers conducting activities throughout Midpen lands, and potentially other individuals at home from contaminated clothing, over the life of the Program could be prolonged. The impact on workers from exposure to potentially cancer-causing dust could be significant. MM Air Quality-3 requires implementation of several asbestos management measures intended to minimize airborne dust and worker exposure including watering of areas proposed for ground disturbing activities in serpentine soils, such as pulling with heavy equipment, and for workers to set mower heads at least six inches off of the ground when mowing in serpentine soils. The impact on worker health from asbestos exposure and health impacts would be less than significant with mitigation.

Prescribed Herbivory

Livestock grazing as pre-treatment has the potential to reduce vegetation cover in the areas grazed but would not cause extensive soil exposure such that dust could become airborne. Impacts on shepherds or passing recreationalists would be less than significant.

Prescribed Burning

Prescribed-burn events would not involve the disturbance of ground that could result in exposure to naturally occurring asbestos. A study conducted during a prescribed burning event in California where naturally occurring asbestos was present found that collected air samples indicated no dangerous levels of airborne asbestos particles were present in the smoke from the fire and personnel were not at risk (USFS, 2013). Burning could occur in areas where naturally occurring asbestos may be found, but these areas would likely be in lower-priority burn units. The potential for disturbance of soil such that it could become airborne is minimal. Exposure of workers would be minimal, and impacts would be less than significant.

Access and Vehicle Travel

Vehicle and equipment travel along unpaved roads has the potential to disturb soils, resulting in airborne dust. Temporary access routes (created from restoration of former logging skid roads) may pass over areas with serpentine soils and rock outcrops. Heavy vehicles and equipment could break down serpentine rocks and disturb soil, dispersing asbestos dust. Workers could be exposed to asbestos dust. Midpen requires vehicles to travel no more than

15 mph on unpaved, unposted roads (LU Regulations Section 500.1, MO Manual Section 07.005), which would minimize the potential for airborne dust. MM Air Quality-3 also requires workers to consult a map created using GIS that shows where serpentine soils and rock formations are located prior to conducting off-road access to a work site. If the work site or temporary access route passes through an area with serpentine soils or rock formations, asbestos-management measures would be implemented including avoiding the tracking of dust into vehicles, and avoiding using compressed air to clean vehicles. Implementation of MM Air Quality-3 and Midpen policies would reduce impacts to less than significant.

Carbon Monoxide Concentrations

Hand Tools, Chemical Application, Propane Flaming, and Prescribed Herbivory

Hand tools, chemical application, propane flaming, and use of livestock for pre-treatment would not require use of combustion engines. Carbon monoxide emissions would not be generated by these tools and techniques. No impact would occur.

Manual and Mechanical Equipment, and Access and Vehicle Travel

Vehicles and equipment traveling across Midpen lands and along temporary access routes to access work sites would generate CO emissions. Vehicle trips would increase, but the vehicle trips and use of equipment would be dispersed along trails and roads over the distinct managed areas within the 59,000-acre Program area, substantially minimizing the potential for high CO concentrations in any one location. Vehicles and equipment would be dispersed as work sites are distributed across Midpen lands. Propane flaming would involve burning of small plants in a limited area. Potential exposure to concentrations of CO would be minimal. Workers conducting pile burning would likely not be conducting attack, sawyer[3], or mop-up activities. Average CO concentrations that firefighters experienced during lighting and holding activities did not exceed 11.6 ppm (Reinhardt, Ottmar, & Hanneman, 2000). This being the case, CO concentrations during pile burning are assumed to not exceed the significance thresholds for workers, and consequently, due to dispersal of CO concentrations, for sensitive receptors, either. The impact on sensitive receptors and workers from CO concentrations would be less than significant.

Prescribed Burning

Prescribed burns could be conducted throughout Midpen lands. CO emitted from prescribed burns is rapidly diluted and is generally not a health concern to the general public due to the infrequency of burns and distance from active burn areas (Story & Dzomba, 2005). Sensitive populations, including the elderly and children, would generally not be exposed to high CO concentrations as a result of prescribed burns due to rapid dilution and the locations where prescribed burns are typically conducted. Workers tending to prescribed burns experience the

[3] Activities include supporting attack efforts or mop up and cutting up smoldering logs or dropping burning snags.

highest exposure of CO concentrations, particularly workers conducting what is known in the industry as "attack"[4] activities. Attack activities have resulted in firefighters experiencing concentrations of CO that were on average 40 percent greater than the next-highest-measured concentrations, which occurred when firefighters were conducting a mix of attack and mop-up activities (Reinhardt, Ottmar, & Hanneman, 2000). Studies have shown average carbon monoxide concentrations over the course of a fireline shift[5] to be 6.9 ppm but can be as high as 58 ppm averaged over the fireline shift (Reinhardt, Ottmar, & Hanneman, 2000). CO concentrations of greater than 200 ppm have been recorded among firefighters fighting wildland fires. Dependent upon conditions, CO concentrations could exceed the most stringent NIOSH CO-concentration significance thresholds of 25 ppm (eight-hour) or 200 ppm (ceiling) during prescribed burning. The impact on worker health from high CO concentrations would be potentially significant as carbon monoxide is very dangerous if inhaled. MM Air Quality-4 requires use of real-time CO monitors and rotation of personnel out of heavy smoke. The exposure impacts would be reduced to less than significant with mitigation.

Toxic Air Contaminants

Hand Tools, Chemical Application, Propane Flaming, and Prescribed Herbivory

Hand tools, chemical application, propane flaming, and use of livestock for pre-treatment would not require use of combustion engines. TAC emissions would not be generated by these vegetation-management tools and techniques. No impact would occur.

Manual and Mechanical Equipment, Access and Vehicle Travel, and Prescribed Burning

Vehicles and Equipment. Use of diesel-powered vehicles and equipment, such as mowers and fire engines, would occur during many vegetation-management and prescribed-fire activities as well as for installation of firefighting infrastructure. Diesel-powered equipment and earth disturbance would emit TACs in the form of diesel exhaust emissions and particulate matter. Diesel exhaust is a complex mixture of gases, vapors, and fine particles, some of which are suspected or known to cause cancer in humans. Vehicles and equipment are required to be inspected and maintained by qualified individuals and to limit idling, which would minimize TAC emissions (MO Manual Sections 08.008 and 08.017). Program activities would not occur continuously in any one location for longer than 2 months, and the numbers of equipment and vehicles would be minimal. As such, diesel exhaust from vehicle and equipment use would not concentrate in the vicinity of sensitive receptors. The impact on sensitive receptors from TACs emitted by vehicles and equipment would be less than significant.

Prescribed and Pile Burns. Pile burns and prescribed burns could be ignited throughout Midpen lands, although Midpen does not anticipate conducting prescribed burns within

[4] Activities included containing larger spot fires and extinguishing flaming and smoldering combustion that had escaped the prescribed unit boundaries.

[5] Defined as an average of seven hours.

0.25 mile of assisted living facilities, schools, or hospitals. Pile burning is conducted under existing conditions although at a lesser scale than proposed under the Program, and could also be conducted near residences or other sensitive receptors. The duration of impacts from TAC emissions generated by burning and smoldering would be short, limited to the one-day burn and one- to two-day mop up. Typically, only a few prescribed burns and pile burn days would occur per year. Smoke from burns would generate TAC emissions, including fine particulate matter, acrolein, PAHs, and formaldehyde.

Exposure to TACs is measured by calculating the proportion of the contaminant to unpolluted air. Increasing the distance between the receptor and the source of the contaminant reduces the proportion of the toxin and thereby dilutes the exposure. Exposure to TAC emissions within smoke could lead to acute and instantaneous eye and respiratory irritation and shortness of breath. Symptoms may also include headaches, dizziness, and nausea lasting several hours. Aldehydes and particulate matter may cause eye, upper respiratory tract, and mucous membrane irritation. In some rare cases, long-term exposure to TAC emissions within smoke could cause reduced lung capacity (Reinhardt, Ottmar, & Hanneman, 2000).

Short-term health impacts are not easily modeled and identified as they would depend on the management of smoke to minimize its drift towards inhabited areas. Smoke drift depends on many factors including the fuel burned, fuel moisture content, and variable atmospheric conditions. According to the World Health Organization (WHO) guidelines, health effects, including eye and lung irritation, can occur when average daily concentrations of $PM_{2.5}$ reach 25 $\mu g/m^3$ (WHO, 2018). The USEPA designates primary NAAQS to protect public health. The primary NAAQS for $PM_{2.5}$, identified in Table 4.3-2, is 35 $\mu g/m^3$. Currently, standards for sub-daily PM concentrations, such as hourly, are not identified by the USEPA due to the uncertainty regarding a relationship between such concentrations and health effects (USEPA, 2016). Data from Australia suggests that maximum daily $PM_{2.5}$ emissions can range from 4 $\mu g/m^3$ to reaching as high as 100 to 200 $\mu g/m^3$ as monitored in the vicinity of a prescribed burn. Concentrations of $PM_{2.5}$, as monitored in the area of several prescribed burns, exceeded 25 $\mu g/m^3$ for periods of time ranging from as little as 1 hour, to up to 16 hours (Haikerwal, et al., 2015).

Midpen employees (or contractors) and firefighters within the immediate area of prescribed and pile burns would experience the greatest exposure to smoke. Pile burns do not expose workers to PAHs that exceed occupational standards, and piles burns contain nearly three times the concentration of PAHs compared to prescribed burns (Robinson, et al., 2008; Robinson, et al., 2011). Both burn types would typically not exceed occupational standards for PAHs during Program implementation. A human-health-risk assessment found that levels of PAHs that wildland firefighters are exposed to are not a major contributors to overall level of cancer risk (NWCG, 2018). The study found benzene did not exceed permitted or recommended exposure levels (per NIOSH RELs or Cal/OSHA PELs) and, therefore, would not pose a substantial risk to Midpen employees or firefighters conducting prescribed burns on Midpen lands. Exposure to airborne acrolein may exceed the maximum permitted levels but would not exceed the recommended TWA level. Exposure to acrolein may cause irritation to the respiratory tract and

mucus membranes. Exposure to airborne formaldehyde would not exceed permitted time-weighted exposure levels but may exceed recommended maximum time-weighted exposure. Respirable particulate matter concentrations may also exceed the permitted time-weighted exposure level. Even though this study found that the concentrations for acrolein, formaldehyde, and particulate matter sometimes surpassed occupational standard limits during burn events, exceedances were generally very rare. More than 17,000 breathing samples from firefighters during active burns were collected for this study, and only between three and five percent of shift-average exposures contained TACs concentrations that exceeded occupational exposure limits (Reinhardt, Ottmar, & Hanneman, 2000). An analysis of health effects from smoke concluded that, although toxic emissions were present in smoke, the incidence of exposure in excess of OSHA exposure limits was relatively low and that the documented health effects were moderate and often reversible (Sharkey, 1997).

Firefighters conducting prescribed burns would be exposed to the highest level of TAC emissions compared to other members of the public or Midpen employees due to the required proximity to the fire necessary to maintain control and supervision. In accordance with CCR, Article 10.1, Section 3411, wildland firefighters are required to be outfitted with personal protective clothing and equipment, which would limit skin and mucous membrane absorption. Midpen requires workers use the same types of personal protective equipment as required for wildland firefighters when conducting pile burns; however, this requirement is not stipulated for prescribed burns, and measures to avoid smoke and TAC emission exposure are not identified (MO Manual Section 13.008).

Midpen employees would not typically be exposed to high TAC levels given that TAC concentrations rarely exceed permitted exposure limits, according to a study conducted on firefighters at active burns. However, there is still a possibility that TAC concentrations could exceed permitted limits during a larger, smokier burn, similar to the levels shown in Table 4.3-11, which could cause short- or even long-term impacts on Midpen employees. Midpen employees overseeing or conducting the prescribed and pile burns could, in rare cases, be exposed to levels of acrolein, formaldehyde, and respirable particulate matter in excess of permitted exposure limits, resulting in a significant impact.

Table 4.3-11 Contaminant Exposure Levels During a Single Burn Event

Toxic Air Contaminant	Adjusted Threshold			Exposure Level	Potential Exceedance?
	Timeframe	PEL[a]	REL[b]		
Acrolein	TWA:	-	0.143 ppm	0.06 ppm – 0.098 ppm	No
	Ceiling:	**0.1 ppm**	-	**0.129 ppm**	**Yes**
Benzene	TWA:	0.114 ppm	0.143 ppm	0.058 ppm – 0.088 ppm	No
	Ceiling:	-	-	0.277 ppm	-
Formaldehyde	TWA:	0.857 ppm	**0.0228 ppm**	**0.075 ppm – 0.6 ppm**	**Yes**
	Ceiling:	-	**0.1 ppm**	**1.456 ppm**	**Yes**

Toxic Air Contaminant	Adjusted Threshold			Exposure Level	Potential Exceedance?
	Timeframe	PEL[a]	REL[b]		
Respirable Particulate Matter	TWA:	**5.7 mg/m^3**	-	1 mg/m^3 – **10.5 mg/m^3**	**Yes**
	Ceiling:	-	-	37.11 mg/m^3	-

Notes:

Bold indicates that a value exceeds thresholds.

[a] TWA thresholds converted from an 8-hour timeframe to a 7-hour timeframe. The data was presented from the study of levels measured on firefighters was over a 7-hour timeframe. Therefore, the thresholds were adjusted down to a 7-hour timeframe.

[b] TWA thresholds converted from a 10-hour timeframe to a 7-hour timeframe.

Source: (OSHA, 2016; CDC, 2016; Cal/OSHA, 2016; Reinhardt, Ottmar, & Hanneman, 2000)

MM Air Quality-4 requires Midpen employees to adhere to procedures to minimize acrolein, formaldehyde, and respirable particulate matter exposure, including avoidance of or rotating personnel through high-smoke areas, hazardous awareness training, and the voluntary use of N95 or N100 dust masks and bandanas, as determined appropriate by the Burn Boss. Respirators may be useful under some circumstances, but studies have shown that respirators that use filters or cartridges to remove harmful contaminants from the air can often lead to higher occurrences to TAC exposure for firefighters (Haston, 2007). These types of respirators do not provide oxygen and can lead to a decreased awareness of smoke concentrations. Acrolein and formaldehyde are highly irritating to mucous membranes, providing a "warning" that smoke concentrations are high. When using respirators, personnel at a burn may stay in dense smoke longer because the irritation has been reduced, therefore leading to longer exposures and higher concentrations of TACs that cannot be filtered by respirators, such as CO. Given the low chance of TACs exceeding occupational limits during a prescribed or pile burn, respiratory protection would not typically be needed. Risk-management practices are the preferred method in the fire management field to minimize TAC emission exposure for workers in and around a burn (Sharkey, 1997; Haston, 2007). The effect on the health of Midpen employees from exposure to air pollutants during prescribed or pile burns would be minimized with mitigation.

The studies detailed above focused on exposure of firefighters to TACs, who would experience the highest levels of smoke inhalation during prescribed and pile burning by the very nature of firefighting. The general population and sensitive receptors would be further away from an active burn and would thus experience lower concentrations of TAC-containing smoke than fire personnel working within or adjacent to a burn. Burns conducted in close proximity to residences and when weather is not optimal for burns, such as wind blowing smoke towards populated areas, could significantly impact the health of sensitive receptors (including eye and lung irritation). Short-term impacts on the heath of sensitive receptors in immediately surrounding areas could potentially occur.

Pile burns are conducted after the vegetative material has dried out (as appropriate, piles may be covered to dry them out), which allows for more complete combustion and less smoke

generation. Furthermore, pile burning is conducted during the wet season when surrounding vegetation is green, minimizing burning of non-target vegetation and excess smoke. Prescribed burns are planned for and conducted under optimal weather conditions (e.g., cool temperatures, high humidity, low wind) to limit air quality and smoke issues for neighboring communities and ensure fire fighters can maintain control. Modeling conducted of mixed conifer forests, found that for all air pollutants, ignition of a wildland fire in an untreated area resulted in higher mean emissions compared to a prescribed fire conducted or a wildland fire ignited in an area after mechanical fuel treatment. The modeling found that emissions from all the mechanical pre-treatment plus prescribed burn emissions with a post-treatment wildland fire equaled the emissions from a comparably sized pre-treatment wildland fire. Although the total emissions may be equivalent to a wildland fire ignited prior to treatment, based on modeling, the reduction in wildland fire risk and catastrophic wildland fire may reduce human exposure to air pollutants. Notably, these emissions would be staggered and due to the ability to plan the prescribed fire, sensitive communities would not necessarily experience the same level of smoke and air quality effects as compared to a wildland fire in an untreated area (Hyde & Strand, 2019).

Burns are planned for and conducted under optimal weather conditions to limit air quality and smoke issues for neighboring communities and ensure fire fighters can maintain control. The Burn Plan prepared for each individual prescribed fire under the guidance of the approving entity, including CAL FIRE, local fire department, BAAQMD, and/or MBARD, identifies these considerations and optimal conditions under which to burn. A Smoke Management Plan must be prepared and implemented for prescribed burns in accordance with and including all the information and restrictions required by BAAQMD's Regulation 5, MBARD's Rule 438, and CCR Title 17, Subchapter 2. For burn events, exposure to TAC emissions would be minimized by ensuring smoke does not drift or blow towards areas with sensitive receptors, in accordance with the Smoke Management Plan and Burn Plan. As required by MM Hazards-3, trails and Midpen-owned roads would be closed within at least 500 feet of the edges of a prescribed burn area for safety reasons unless the Burn Boss or Midpen determines otherwise, limiting exposure of recreationalists to TAC emissions (even though passive recreationalists are not technically considered sensitive receptors due to their mobility and minimal exertion). Mitigation and compliance with regulations would, therefore, limit the duration of exposure and concentration of pollutants at sensitive receptors by placing limits on burning. Smoke drift that could cause short-term health effects would, therefore, be minimized. Contingency actions would be taken if a burn unexpectedly impacts sensitive receptors. Contingency actions would include halting ignition, suppressing fire, and beginning immediate mop up before a significant exposure can occur. It is acknowledged that some short-term effects from smoke may still be experienced in these rare circumstances, such as stinging, watery eyes, coughing, and runny noses as well as shortness of breath, headaches, dizziness, and nausea. The duration of such effects would be very short and can generally be avoided by remaining indoors with windows closed, wearing a dust mask when outside, or moving away from affected outside areas until the smoke clears. Despite adherence to burn-specific plans and regulations, smoke generated by each prescribed burn conducted under the Program may not behave as predicted and could expose sensitive

receptors (including nearby residences) to TAC emissions and short-term health risks. Long-term and more serious impacts would not occur as burning would only occur a few times per year, over a few days, and would typically not impact the same receptors. The impact on sensitive receptors from prescribed burning would be potentially significant and unavoidable.

Analysis of Plans

Vegetation Management Plan

New VMAs would be created and maintained. Continued maintenance of existing fuelbreaks and defensible spaces would occur. Serpentine soil or rock formations may be located within areas where these vegetation management activities would occur. The potential overlap between locations where work could occur and areas where serpentine soils and rock formations could be encountered comprise less than one percent of Midpen lands. Removal of vegetation by hand or using equipment, as well as use of heavy vehicles and equipment in serpentine areas has the potential to expose workers to asbestos dust. Dust from vehicles and equipment accessing work sites would be minimized in accordance with Midpen requirements, which requires vehicles to travel no more than 15 mph on unpaved, unposted roads (LU Regulations Section 500.1; MO Manual Section 07.005), which would minimize the potential for airborne dust. Mowing could generate naturally occurring asbestos dust if mowing heads are set too low to the ground surface. Use of diesel vehicles and equipment would emit CO and TACs but would not result in high concentrations in the vicinity of sensitive receptors since emissions would only expose the nearest receptors for a few hours to a few days, and the amount of equipment in any one location would be limited.

Pile burning has the potential to expose workers in the vicinity of a burn to levels of CO, acrolein, formaldehyde, and respirable particulate matter that could impact their health. Due to the short duration of pile burns, limited size, and wet weather conditions during which pile burns are conducted, the potential to cause significant short-term effects on sensitive receptors is minimal. Midpen employees could be at risk from pile burns.

The effect on Midpen employees from vegetation management activities could be significant. MM Air Quality-3 would be implemented to reduce the asbestos-exposure risk by requiring watering of disturbed soils in serpentine soils or bedrock areas and requiring that mowing heads are set high enough above the soil so as not to generate asbestos-containing dust. MM Air Quality-4 requires use of CO monitors, training Midpen employees, availability of masks and bandannas, and rotations of Midpen employees through areas with heavy smoke. The impact from pile burning and other vegetation management activities would be reduced to less than significant with mitigation.

Prescribed Fire Plan

Equipment and vehicles would be used during pre-treatment, the burn, and mop up of the burn, which could disturb serpentine soils and expose workers to asbestos dust. Use of diesel vehicles and equipment would emit CO and TAC emissions but would not result in high concentrations in the vicinity of sensitive receptors. Prescribed burning has the potential to expose Midpen employees to levels of acrolein, formaldehyde, and respirable particulate matter

that could impact their health. Smoke could blow towards nearby homes, affecting sensitive receptors' health (including eye and lung irritation). Preparation and implementation of a Burn Plan and Smoke Management Plan would minimize smoke in areas of sensitive receptors.

The effect on Midpen employees and sensitive receptors from prescribed burning activities could be significant. MM Air Quality-3 would be implemented to reduce the asbestos-exposure risk by requiring watering of disturbed soils in serpentine soils or bedrock areas and requiring that mowing heads are set high enough above the soil so as not to generate asbestos-containing dust. MM Air Quality-4 requires use of CO monitors, training Midpen employees, availability of masks and bandannas, and rotations of workers through areas with heavy smoke. MM Hazards-3 requires closure of trails and Midpen-owned roads within at least 500 feet of the edges of a prescribed-burn area. Due to the unpredictability of smoke, even on days with optimal conditions, the impact from prescribed burning would be potentially significant and unavoidable with mitigation.

Wildland Fire Pre-Plan

Installation and construction of firefighting infrastructure, such as new water tanks and piping, would involve use of vehicles and equipment, and the activities would likely be ground-disturbing. These activities could be conducted in areas with serpentine soils and serpentine rock formations, exposing workers to asbestos dust. MM Air Quality-3 would be implemented to reduce the asbestos-exposure risk by requiring watering of disturbed soils in serpentine soils or bedrock areas should infrastructure construction be needed in such an area. The impact on workers from dust containing asbestos would be reduced to less than significant with mitigation.

	Significance Determination
Impact Air Quality-4: Emissions (such as those leading to odors) adversely affecting a substantial number of people.	**Significant and unavoidable**

Implementation of the Program would involve use of diesel-powered equipment and vehicles. Diesel exhaust from equipment and vehicles as well as volatile organic compounds emitted during painting or paving, if installed as part of the firefighting infrastructure, would generate some odors. Odors could temporarily increase in the immediate vicinity of the equipment operation. The odors would dissipate rapidly with distance from the odor-generating activity. The generation of odors from use of diesel engines and paving activities would not be substantial or permanent.

Smoke from prescribed burning could affect a substantial number of people under certain circumstances, including workers, recreationalists, and residences, as analyzed under Impact Air Quality-3. Pile burn smoke would not be expected to affect a large number of people due to the duration of the burn, wet weather conditions, and limited size of the burn area. Preparation and implementation of a Burn Plan and Smoke Management Plan would minimize smoke from prescribed burns in areas of substantial numbers of receptors by ensuring that prescribed burns

are conducted under optimal weather conditions. MM Hazards-3 requires closure of trails and Midpen-owned roads within at least 500 feet of the edges of a prescribed burn area. With mitigation and adherence to regulations, a substantial number of people would typically not be subjected to objectionable smoke, but due to the unpredictability of smoke, the impact would remain potentially significant and unavoidable.

4.3.6 Mitigation Measures

MM Air Quality-1: Fugitive Dust Control Measures for Infrastructure Installation

At a minimum, the following control measures must be implemented during construction:

- When moisture content is low enough to create dust, all exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered or treated with a non-synthetic dust palliative (e.g., organic nonpetroleum products) as often as needed to control dust emissions.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- Vehicle ingress and egress locations shall be stabilized to minimize erosion and sediment transfer.
- For Program activities involving grading or excavation conducted directly off public roads, all visible mud or dirt track-out onto adjacent public roads shall be removed. The use of dry power sweeping is prohibited on public roads.
- All vehicle speeds on unpaved roads shall be limited to 15 mph, in accordance with Midpen policy (LU Regulations Section 500.1; MO Manual 07.005).
- All roadway, driveway, and sidewalk paving shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- A publicly visible sign shall be posted with the telephone number and person to contact at Midpen regarding dust complaints. Midpen shall respond and take corrective action within 48 hours. The applicable air district's (e.g., BAAQMD or MBARD) phone number shall also be visible to ensure compliance with applicable regulations.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, § 2485 of CCR). Clear signage shall be provided for construction workers at all access points.
- Construction equipment shall be properly maintained by a certified mechanic.

Applicable Location(s): Areas with grading or blading.

Performance Standards and Timing:

- **Before Activity:** Post a publicly visible sign with contact information for the public to make dust complaints.
- **During Activity:** (1) Water exposed surfaces twice a day, (2) cover filled haul trucks, (3) adequately manage soil track-out, (4) limit vehicle speeds, (5) limit idling to 5 consecutive minutes, and (6) have construction equipment maintained by a certified mechanic.
- **After Activity:** N/A

MM Air Quality-2: Burn Emission Reduction Techniques

For activities within a small portion of Long Ridge OSP and a very small portion of Sierra Azul OSP that falls within the NCCAB, Midpen shall limit pile burning to 8.8 tons (i.e., not more than nine 10-foot-wide by six-foot-high parabolic piles of shrub/hardwood vegetation or equivalent) in any one day.

Midpen shall incorporate the following measures during planning and implementation of a prescribed burn, where feasible:

- When considering a prescribed burn, weigh the habitat benefits of burning in a particular vegetation type against the emissions.
- Reduce the total area burned through mosaic burning.
- Burn when fuels have a higher fuel moisture content.
- Reduce fuel loading by decreasing the density of vegetation and other fuels before ignition using mechanical treatments, manual treatments, prescribed herbivory, and pile burning.
- Schedule burns before new vegetation growth, increasing fuel loads.
- Delay planned burns when a Spare the Air Burn Ban has been declared.

Applicable Location(s): Prescribed burn projects in the NCCAB and SFBAAB; Pile burning in NCCAB.

Performance Standards and Timing:

- **Before Activity:** (1) Choose vegetation types with fewer emissions when other considerations are equal, (2) reduce the fuel loads, and (3) schedule burn prior to new vegetation growth.
- **During Activity:** (1) Mosaic burn, (2) burn when fuels have higher moisture content, and (3) limit pile burns conducted in any one day in NCCAB.
- **After Activity:** N/A

MM Air Quality-3: Asbestos Management

Prior to conducting any activities requiring manual soil-disturbing activities (e.g., pulling of vegetation or trenching), use of mechanical equipment (e.g., skid steer loader or backhoe), or off-road access to a work site, consult the map created using GIS that shows where serpentine soils and rock formations are located. If the work site or temporary access route passes through an area with serpentine soils or rock formations, implement the asbestos-management measures (below), developed based on CARB Asbestos Airborne Toxic Control Measures developed for construction and grading operations.

Asbestos Management Measures:

- Areas known to have asbestos shall be watered during ground-disturbing activities (e.g., pulling of medium-to-large vegetation, digging large holes for planting) to ensure that the soil remains moist during the extent of the activity.
- Avoid or minimize the tracking of dust into vehicles.
- Do not use compressed air for cleaning your vehicles after your visit. Use a wet rag to clean the interior.
- All vehicle speeds on unpaved roads shall be limited to 15 mph, in accordance with Midpen policy (LU Regulations Section 500.1; MO Manual 07.005).
- When mowing in serpentine soils, the mower head shall be set at least 6 inches above the ground to minimize asbestos dust generation. If when mowing, dust is seen from the mower pluming more than 4 feet above the ground surface, the mower shall be adjusted to the minimum height needed to avoid generating dust plumes.

Applicable Location(s): Areas with serpentine soils or rock formations where activities could occur.

Performance Standards and Timing:

- **Before Activity:** Water areas with serpentine soils or exposed rock formations.
- **During Activity:** (1) Water exposed surfaces twice a day, (2) limit vehicle speeds, and (3) raise mower head to minimize dust.
- **After Activity:** N/A

MM Air Quality-4: Midpen Employee Protection from Prescribed Burn Air Pollutants

Midpen shall require that prescribed burns on Midpen lands are managed to reduce Midpen employee exposure to CO concentrations and other air pollutants through implementation of the following measures:

- Use real-time CO monitors.
- Train workers to be aware of smoke hazards associated with prescribed and pile burns.
- Rotate personnel out of heavy smoke areas and routinely monitor for smoke exposure during burn events.
- Avoid burning heavy fuel loads, such as large logs, on the ground to avoid additional mop up.
- Strategically place firefighters and fire lines where smoke exposure is less.
- N95 or N100 dust masks, or bandanna shall be available for voluntary use and must be used when recommended by the Burn Boss.

Applicable Location(s): Prescribed burn locations.

Performance Standards and Timing:

- **Before Activity:** Purchase real time CO monitors.
- **During Activity:** (1) Provide real-time CO monitors to firefighters, (2) rotate firefighters out of heavy smoke areas, and (3) avoid burning of areas with heavy fuel loads.
- **After Activity:** N/A

MM Hazards-3: Safety Around Prescribed Burns

Refer to Section 4.8: Hazards, Hazardous Materials, and Wildland Fire

4.4 Biological Resources

4.4.1 Introduction

This section describes the biological conditions of Midpen lands and evaluates potential impacts on sensitive biological resources from the implementation of the management actions included in the Program. The biological resources analysis is based on a review of available GIS data and literature as well as technical expertise. Detailed information regarding species and vegetation communities is provided in Appendix 4.4.

Comments related to biological resources impacts were received during the public scoping period. A summary of these comments and the location where they are addressed in the biological resources analysis are provided in Table 4.4-1.

Table 4.4-1 Biological Resources Scoping Comments

Summary of Comment	Location Addressed
Special-status species • The EIR should: – Include a comprehensive list of special-status species with potential to occur. – Assess harm to olive-sided flycatchers (*Contopus cooperi*) nesting habitats. – Specify the methods and protocols for rare plant surveys in areas identified for vegetation treatment and removal. • Mitigation measures should be identified for special-status wildlife, special-status plant species, nesting birds, state fully protected species, bats, marbled murrelet (*Brachyramphus marmoratus*), California red-legged frog (*Rana draytonii*), and western pond turtle (*Actinemys marmorata*). • Program actions need to be weighed carefully to protect endangered and other wildlife species in Program areas.	Appendix 4.4 Section 4.4.6: Impact Analysis Section 4.4.7: Mitigation Measures
Regulatory considerations • The EIR should provide a summary of permitting and regulatory requirements related to biological resources.	Section 4.4.4: Regulatory Setting
Habitats • The EIR should address habitat fragmentation and potential impacts to habitat connectivity from significant vegetation clearing and creation of edge effects. • The Program should develop criteria for grassland management success.	Section 4.4.6: Impact Analysis
Prescribed burning • The EIR should: – Expand on the benefits and potential harmful impacts of prescribed burns to existing ecosystems, habitats, and species – Ensure weed infestations after prescribed burning is addressed as a potential impact and minimized, as concerns were cited over previous efforts such as at Russian Ridge	Section 4.4.6: Impact Analysis

Summary of Comment	Location Addressed
Invasive species • The EIR should: – Identify measures to control invasive species encroachment during and following Program activities. – Address the impacts of plowing. Plowing fire breaks could drive native seeds in soil too deep so they can never sprout, producing permanent weed-covered areas. • The Program should: – Address Eucalyptus trees (*Eucalyptus spp.*) and other non-native species (e.g., french broom [*Genista monspessulana*]). – Remove coyote bush (*Baccharis pilularis*), which is covering at least half the open meadows, to reduce invasive species.	Section 4.4.6: Impact Analysis

4.4.2 Definitions

Special-Status Plant Species

For the purposes of this analysis, special-status plant species include the following:

- Plant species listed by the USFWS
- CDFW as Threatened or Endangered; proposed for listing as Threatened or Endangered; or as a candidate for listing as Threatened or Endangered under the state or federal Endangered Species acts.
- Plants with a California Native Plant Society (CNPS)-designated California Rare Plant Ranking (CRPR) listing of 1, 2, 3 or 4. These species are included because the CNPS is an authority recognized by the CDFW on the status of rare plant species in California.
- Plant species considered as "Endangered, Rare or Threatened" as defined by Section 15380 of the CEQA Guidelines. Section 15380(b) states that a species of animal or plant is "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors. A species is "rare" when either "(A) although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become Endangered if its environment worsens; or (B) the species is likely to become Endangered within the foreseeable future throughout all or a portion of its range and may be considered 'Threatened' as that term is used in the Federal Endangered Species Act" (FESA).

Sensitive Natural Communities

Sensitive natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status plants or their habitat. CDFW's California Natural Community List (CDFW 2019) is based on the best available information, and indicates

which natural communities are considered sensitive at the current stage of the California vegetation classification effort. Natural communities with ranks of S1, S2, and S3 are considered sensitive natural communities and therefore addressed under CEQA. The *Ecological Subregions of California* (USDA, 1997) form the framework for describing regional variation in California ecoregions that vegetation alliance descriptions and distributions in *A Manual of California Vegetation* (Sawyer et al. 2009) are based on. *A Manual of California Vegetation* (Sawyer et al. 2009) defines the currently recognized method of vegetation classification and mapping in California, which is accepted by CNPS and CDFW, and is utilized to determine the rarity and endangerment of these vegetation types that can result in sensitive natural communities' designation.

Midpen has also identified vegetation types within their lands as Biologically Highly Significant (BHS), which are considered sensitive natural communities herein. Natural communities designated as BHS within Midpen lands are globally rare, or restricted just to the San Francisco Bay Area or the Santa Cruz Mountains. Other communities, such as wetlands, riparian communities, and grasslands, though once more widespread, have been made rare because of widespread habitat conversion for urban and agricultural uses. Some communities designated as BHS by Midpen are ruderal or dominated by non-native or invasive species and have received a BHS designation due to the presence of sensitive native resources (botanical, wildlife, edaphic [from soils], occur in wetlands, or otherwise) within those communities. The source of BHS designations is from Midpen's Conservation Atlas (Midpen, 2014a) and their vegetation classification GIS dataset (Midpen, 2018).

The Program area contains vegetation communities, wetlands, and other landscape features (e.g., rock outcrops) that are: (1) classified as sensitive natural communities in California; (2) considered "biologically highly significant" by Midpen; or (3) both. Most of the riparian vegetation communities, wetlands, and other aquatic features in the Program area are protected under the federal Clean Water Act, the state's Porter-Cologne Act, the California Coastal Act, Section 1602 of California Fish and Game Code, or a combination of these regulations. These vegetation communities, wetlands, and landscape features are generally referred to as "sensitive communities" or "sensitive natural communities" in this section.

Special-Status Wildlife Species

For the purposes of this analysis, special-status wildlife species include the following:

- Animal species listed by the USFWS or CDFW as Threatened or Endangered; proposed for listing as Threatened or Endangered; or as a candidate for listing as Threatened or Endangered.
- Animal species considered as "Endangered, Rare or Threatened" as defined by Section 15380 of the CEQA Guidelines. Section 15380(b) states that a species of animal or plant is "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors. A species is "rare" when either "(A) although not presently threatened

with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become Endangered if its environment worsens; or (B) the species is likely to become Endangered within the foreseeable future throughout all or a portion of its range and may be considered 'Threatened' as that term is used in the ESA."

- Animal species designated as "Species of Special Concern" or "Fully Protected" by the CDFW. Although these species have no legal status under the California Endangered Species Act (CESA), CDFW recommends their protection as their populations are generally declining and they could be listed as Threatened or Endangered (under CESA) in the future. "Fully Protected" species generally may not be taken or possessed at any time.
- Birds designated by the USFWS as "Birds of Conservation Concern." Although these species have no legal status under FESA, USFWS recommends their protection as their populations are generally declining, and they could be listed as Threatened or Endangered (under FESA) in the future.

Critical Habitat

Critical habitat is a term defined and used in FESA. It is a specific geographic area(s) that contains features essential for the conservation of a species listed by the USFWS as Threatened or Endangered and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. An area is designated as "critical habitat" after USFWS publishes a proposed federal regulation in the Federal Register and then they receive and consider public comments on the proposal. The final boundaries of the critical habitat area are also published in the Federal Register. Federal agencies are required to consult on actions they carry out, fund, or authorize to ensure that their actions will not destroy or adversely modify critical habitat. A critical habitat designation generally has no effect on situations or projects that do not involve a federal agency (USFWS, 2015).

4.4.3 Existing Environment

Regional Ecological Setting

Overview

Midpen lands encompass portions of three counties: San Mateo, Santa Clara, and Santa Cruz counties. These lands, comprised of separate OSPs, are primarily managed to preserve a regional greenbelt of open space land. Midpen lands protect a variety of habitats rich in both numbers and variety of plants and animals. OSPs support tidal salt marshes in the east along the San Francisco Bay shoreline, home to the endangered Ridgway's rail (*Rallus obsoletus*) and salt marsh harvest mouse (*Reithrodontomys raviventris*) as well as used by thousands of migratory birds. The heart of Midpen lands is at higher elevations in the Santa Cruz Mountains. These lands are covered in a diverse mix of oak woodland, grassland, chaparral, coastal scrub, and both evergreen and coniferous forests that form an impressive scenic backdrop for the densely populated San Francisco Bay Area and Central California Coast. Creeks and streams

that run through Midpen lands provide refuge area for endangered coho salmon (*Oncorhynchus kisutch*) and threatened steelhead trout (*Oncorhynchus mykiss irideus*). The waterways also provide important habitat and movement corridors for upland wildlife, and have been identified as part of the Conservation Lands Network's Bay Area Critical Linkages (Penrod et al. 2013), connecting wildlife habitat in the Santa Cruz Mountains east to the Diablo Range and south to the Gabilan Mountains.

Ecological subregions (ecoregions) provide a relevant context for biological resources. Midpen lands are located within the Santa Cruz Mountains and Leeward Hills subsections[1] of the Central California Coast Section[2] (USDA, 1997). Two OSPs are in the Bay Flats ecoregion. Each of these subsection ecoregions are further described below (Griffith, Omernik, Smith, & Cook, 2016).

Santa Cruz Mountains

The Santa Cruz Mountains subsection is located between the Pacific Ocean and San Andreas Fault. The majority of Midpen lands are located within this subsection, with the exception of Sierra Azul OSP, Ravenswood OSP, and Steven's Creek Shoreline Nature Area (Griffith, Omernik, Smith, & Cook, 2016). The climate is temperate to hot in this subsection, but generally very mild, due to prevalent marine effects. Mean annual precipitation is about 20 to 60 inches, practically all of which is precipitated via rain although some snow can occur at higher elevations. Summer fog is common. Water runoff is rapid and streams on the northeast side of the mountains are usually dry during summer, while those on the seaward side are generally perennial. Natural lakes, or sag ponds, occur in the San Andreas fault zone.

The mountains in this subsection are northwest trending with rounded edges, steep sides, and narrow canyons. The crest of this range is near the northeast edge of the range, parallel to the San Andreas Fault on the northeast side of the mountains. Many of the streams present flow in a southwest direction. There are some dissected marine terraces along the coast, and narrow floodplains and terraces have some recent alluvium. The elevation range for this subsection is from sea-level to approximately 2,000 feet, with a high point of 3,231 feet on Castle Rock Ridge.

Leeward Hills

The Leeward Hills subsection is located on the interior, or northeast, side of the Santa Cruz Mountains between the San Andreas fault and the alluvial plain in the Santa Clara Valley at the south end of San Francisco Bay. Of all Midpen lands, only Sierra Azul OSP lies within this subsection. is the Leeward Hill subsection is much drier than the seaward side of the mountains. The climate is hot and sub-humid, with moderate marine influence. Mean annual

[1] A subsection is defined as an ecological unit with similar surficial geology, lithology, geomorphic process, soil groups, subregional climate, and potential natural communities (USDA 1997).

[2] A section is defined as an ecological unit having broad areas of similar geomorphic process, stratigraphy, geologic origin, drainage networks, topography, and regional climate (USDA 1997).

precipitation is about 15 to 30 inches, precipitated primarily as rain, except for some snow on at higher elevations. Runoff is rapid and the streams are generally dry during the summer. There are no natural lakes, but numerous reservoirs.

The mountains in this subsection are northwest trending with rounded edges, steep sides, and narrow canyons. The crest of this range is near the northeast edge of the range, parallel to the San Andreas Fault on the northeast side of the mountains. Most of the streams on the leeward side that drain toward the northeast are relatively short. The San Andreas fault is near the southwest edge of the subsection, but generally lies in the adjacent Santa Cruz Mountains subsection to the west. Elevations range from about 200 feet up to 3,790 feet on Loma Prieta Peak.

Bay Flats

The Bay Flats ecoregion includes the near-water flats around San Pablo Bay in the north and those at the southern end of San Francisco Bay. Elevations are sea level to about 10 feet on Quaternary bay fill of silt and clay. High tides inundate most of the area. Soil temperature regimes are isomesic and soil moisture regimes are aquic. Common vegetation includes pickleweed and saltgrass. The southern part of the ecoregion is somewhat warmer and drier than the northern part and has less summer fog. The southern part receives 14 to 16 inches of annual precipitation, whereas the northern part receives 20 to 28 inches. Several salt evaporation ponds are found in the southern Bay Flats, where saltwater is impounded within levees in the former tidelands. As the water evaporates, microorganisms of several kinds change the color of the water. Restoration efforts are underway to return some salt ponds to a mix of tidal marsh, mudflat, and other wetland habitats. Ravenswood OSP and Steven's Creek Shoreline Nature Area are within Bay Flats.

Biological Setting of Midpen Lands

Overview

Midpen lands generally flank the crest of the Santa Cruz Mountains from the cities of Half Moon Bay and San Carlos in the north to Loma Prieta Peak in the south and range from nearly sea level to 3,790 feet. From Miramontes Ridge OSP to the southern end of Castle Rock Ridge, near Bear Creek Redwoods OSP, the Santa Cruz Mountains crest runs parallel, and west, of the San Andreas Rift Zone. Only Sierra Azul OSP is included in the southern Santa Cruz Mountains. Many other notable peaks within the Santa Cruz Mountains fall within Midpen lands in addition to Loma Prieta Peak, such as Kings Mountain (2,315 feet), Black Mountain (2,810 feet), Saratoga Summit (580 feet), and Mount Umunhum (3,442 feet). Midpen lands on the west side of the Santa Cruz Mountain crest, especially those at lower elevations, have a stronger coastal influence especially in terms of higher precipitation and fog cover; including Miramontes Ridge OSP, Purisima Creek Redwoods OSP, Tunitas Creek OSP, El Corte de Madera Creek OSP, and La Honda Creek OSP. Midpen lands on the east (leeward) side of the crest are less directly influenced by the coast and experience lower precipitation totals and fewer days of fog, except the OSPs located in passes, including Teague Hill, Rancho San Antonio, Picchetti Ranch, and Sierra Azul OSPs.

Water Resources

Midpen lands contain a variety of water resources that include freshwater, estuarine/brackish, and marine habitats. Water features on and immediately downstream of Midpen lands include year-round streams, ephemeral and perennial creeks, lakes, reservoirs, ponds, and wetlands. Salt marshes occur along the edge of San Francisco Bay.

Within Midpen lands, seven major watersheds empty into either the Pacific Ocean (west of Santa Cruz Mountains crest) or San Francisco Bay (east of Santa Cruz Mountains crest). Hydrology in these watersheds is influenced by precipitation, surface water runoff, geologic stratigraphy, topography, soil permeability, and plant cover. Drainages range from ephemeral and intermittent to perennial streams. Waters within Midpen lands are shown in Figure 4.4-1. Additional information on waters and hydrology is provided in Section 4.9: Hydrology and Water Quality.

Significant and Influential Underlying Substrates

Overview

Certain geologic substrates found in the area have a significant effect on the plant species associations they support. Within Midpen lands, two primary bedrock types, serpentinite and Butano Sandstone, affect the constituent vegetation associates. These two bedrock types and derived soils support many of the endemic rare plants known to this region. Refer to Section 4.6: Geology and Soils for more information on the bedrock types underlying Midpen lands.

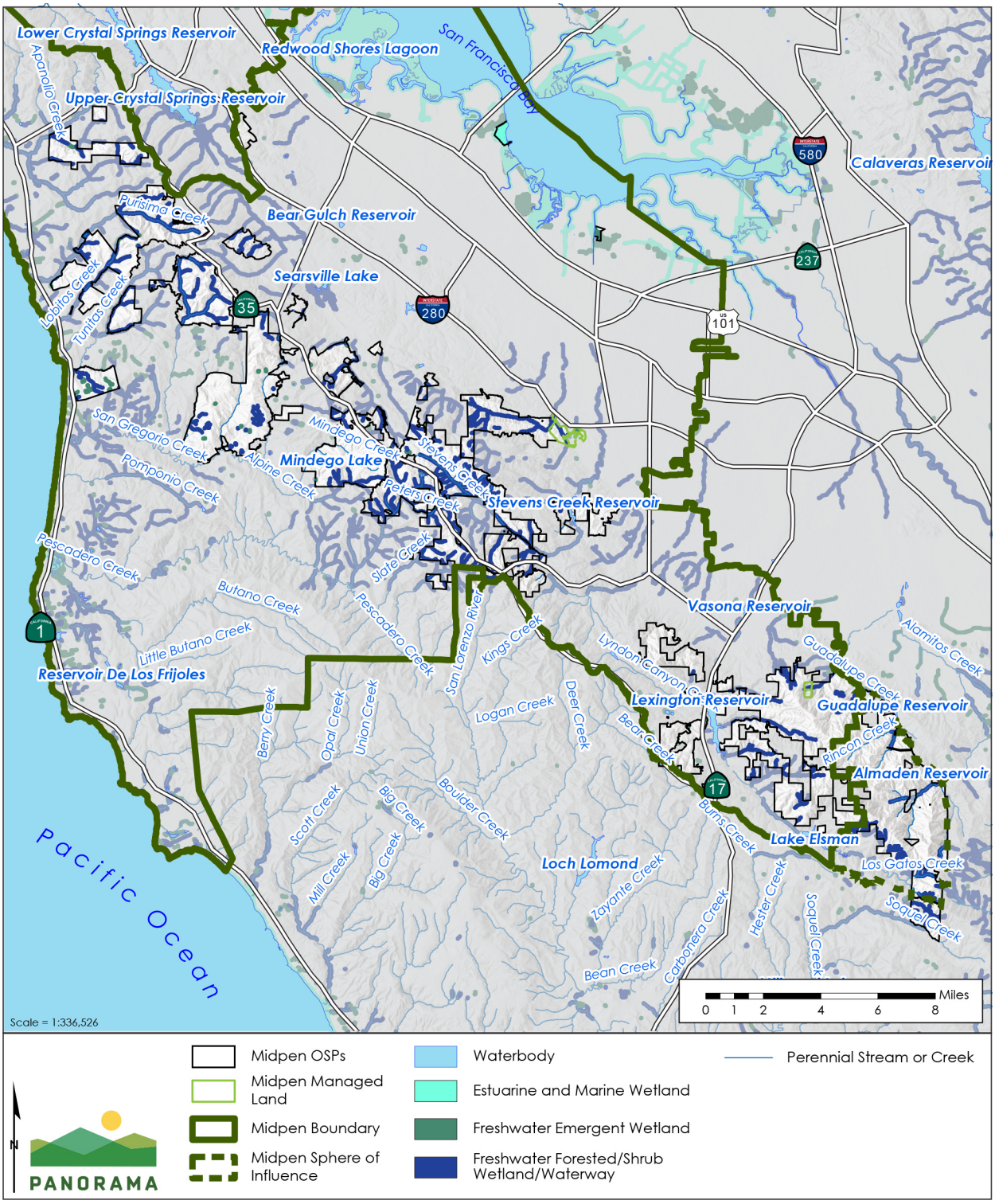
Serpentine

Serpentine and other ultramafic rocks are the parent material for soils high in magnesium, iron, silicates, and nickel and low in calcium. These chemical and mineral properties create a toxic environment that most plant species are unable to tolerate. Evolutionary and distributional responses to these conditions have resulted in plant species that are endemic to serpentine, are locally or regionally confined to serpentine, are indifferent and occur both on and off serpentine, or are plant species that do not occur on serpentine (Kruckeberg 1984). Primary serpentinite bedrock is mostly found on the east side of the San Andreas Rift Zone in this region, with few exceptions. The OSPs that contain serpentine habitat include El Sereno, Long Ridge, Monte Bello, Rancho San Antonio, Saratoga Gap, Sierra Azul, Skyline Ridge, and St. Joseph's Hill. Of these OSPs, Sierra Azul, Monte Bello, and El Sereno contain the largest amount of serpentine habitat (Brabb et al. 2000; Wentworth et al. 1999).

Butano Sandstone

Butano sandstone is Eocene aged deposits forming sandstone, mudstone, and shale (Brabb et al. 2000). This sandstone is unique to the area due to its physical and chemical composition and is correlated to a local endemic manzanita species. Within Midpen lands this bedrock mainly occurs within Purisima Creek, El Corte de Madera Creek, and La Honda OSPs.

Figure 4.4-1 Waterways and Wetlands Within Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; USFWS, 2019b)

Vegetation Communities and Land Cover

Overview

Midpen lands support a wide variety of vegetation communities, ranging from grasslands to chaparral, oak woodland, and redwood forests. Vegetation types included in this section are documented in Midpen's spatial dataset[3] based on previous Midpen mapping efforts and other sources (Midpen, 2018). This vegetation dataset follows the CNPS and CDFW methodology for vegetation data classification, although it appears to include a variety of vegetation nomenclature. This methodology is based on the National Vegetation Classification System's hierarchy of alliances and associations, which are floristically and environmentally defined plant communities such as those presented in *A Manual of California Vegetation* (Sawyer et al. 2009).

Vegetation communities that occur on Midpen lands are separated into two categories: upland vegetation communities and aquatic vegetation communities. The types of communities found within the two categories are described in detail below. Vegetation communities on Midpen lands are shown in Figure 4.4-2.

Appendix 4.4 provides the detailed vegetation crosswalks for upland and aquatic communities that compare general vegetation types to those in the Midpen dataset, as well as other commonly used vegetation classification systems.

Upland Vegetation Communities

Overview

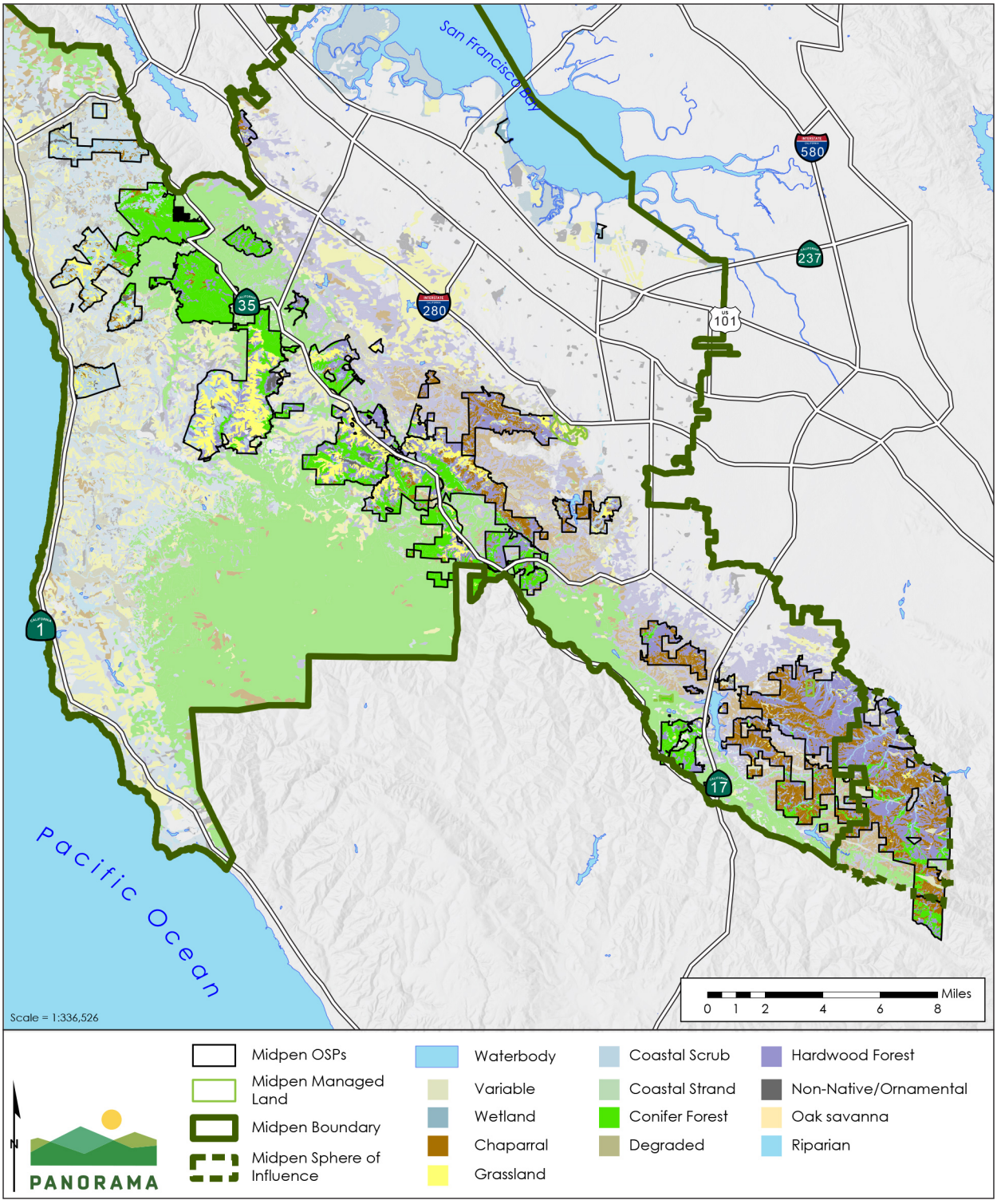
Upland vegetation communities comprise the largest proportion of communities present on Midpen lands. Many of these upland vegetation communities occur in areas underlain by serpentinite substrate (refer to Appendix 4.4 for details). Certain areas mapped on Midpen lands are not considered terrestrial natural communities, as terrestrial vegetation is not supported, or the area is considered anthropogenic, developed, or a waste area.

Non-Native or Ornamental

Non-native or ornamental communities are those dominated by non-native species. These communities often have a history of anthropogenic disturbance or are a result of intrusion of invasive weed species. Dominant non-native weed species of these communities include broom species (*Genista* spp., *Cytisus* spp., *Spartium* spp.), Harding grass (*Phalaris aquatica*), velvet grass (*Holcus lanatus*), acacia (*Acacia* spp.), poison hemlock (*Conium maculatum*), and yellow starthistle (*Centaurea solstitialis*). Species range from annual herbs to medium sized trees in this community, many are considered noxious (Cal-IPC, 2020), and often form monotypic stands.

[3] It should be noted that this vegetation data set may be outdated, has not been entirely field verified, and is may be inaccurate in some locations which is an inherent result when mapping at large scales.

Figure 4.4-2 Vegetation Communities Within Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; Midpen, 2018)

In some instances, these communities may be dominated by non-native trees including blue gum (*Eucalyptus globulus*), or trees transplanted from their indigenous ranges such as pines (*Pinus radiata*) or cypress (*Hesperocyparis macrocarpa*). These species may also be naturalized in these areas. Native species may be present in these communities, although these species rarely constitute major components and are often considered relictual. This community type is present throughout Midpen lands on a variety of soils and topographies and is often found in waste areas, roadsides, and highly disturbed grasslands. Although habitat quality is low in these communities, some native components are retained. Approximately 880 acres of the Program area is of the non-native or ornamental community type.

Grassland

Grassland communities are widespread on Midpen lands. These communities tend to lack shrub and tree layers and are most commonly dominated by non-native annual grasses (e.g., *Bromus* spp., *Avena* spp. and *Hordeum* spp.) and native and non-native forbs common throughout California. These communities can retain moderate native integrity with native species being present and even dominant or codominant in some areas. Where serpentine bedrock is present, native integrity increases greatly with both native grass and forb abundance. For example, stands of pure native species (i.e., purple needlegrass [*Stipa pulchra*] or California oatgrass [*Danthonia californica*]) are uncommon, except when occurring on serpentine bedrock or closer to the coast, respectively. These communities have historically been subject to more frequent fire intervals than currently in light of fire suppression, and this has contributed to their degraded native composition and increased conversion to shrub or woodland/forest dominated communities in some areas, from species such as coyote brush (*Baccharis pilularis* subsp. *consanguinea*), coast live oak (*Quercus agrifolia* var. *agrifolia*), and Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*). Although present throughout Midpen lands, grassland communities are concentrated in the central and northern preserves on both the west and east faces of the Santa Cruz Mountains. Intact native grasslands are most commonly present on the serpentine habitats of Sierra Azul, El Sereno, and Rancho San Antonio OSPs. This community comprises approximately 6,250 acres of the Program area.

Coastal Scrub

Coastal scrub communities are widespread on Midpen lands. Dominant species typically include coyote brush, California sagebrush (*Artemisia californica*), bush monkeyflower (*Diplacus aurantiacus*), oceanspray (*Holodiscus discolor*), *Rubus* spp. (*R. parviflorus, spectabilis, ursinus*), poison oak (*Toxicodendron diversilobum*), and hazelnut (*Corylus cornuta* subsp. *californica*), among others. These communities are often characterized as soft chaparral that form stands of low, near continuous to closed cover canopies. This community has a sparse herbaceous understory and few emergent trees present, although a more open shrub layer and a significant herbaceous component may be present. In many ways, scrub communities are similar to chaparral communities, although scrub communities tend to inhabit more moist coastal habitats. Scrub habitats dominated by bush monkeyflower, coyote brush codominant with oceanspray, *Rubus* spp., hazelnut, and oceanspray are considered sensitive natural communities. Within Midpen lands, scrub communities are more common on the western slopes of the Santa Cruz Mountains

and are concentrated in the northern preserves. The coastal scrub community comprises approximately 5,930 acres of the Program area.

Chaparral

This community is widely distributed within Midpen lands. Chaparral is typically dominated by dense stands of various native shrub to small tree species including manzanita (*Arctostaphylos* spp.), birch-leafed mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), bitter cherry (*Prunus emarginata*), ceanothus (*Ceanothus* spp.), chamise (*Adenostoma fasciculatum* subsp. *fasciculatum*), scrub oaks (*Quercus* spp.), and chinquapin (*Chrysolepis chrysophylla*), among others. These communities are most often characterized by dense, impenetrable stands with sparse tree and herbaceous layers. Many chaparral communities are adapted to fire. It is not uncommon for chaparral communities to occur on thin and exposed substrates, including serpentine, and many are considered sensitive natural communities. While present in the northern reaches of Midpen land, chaparral communities are more common in the southern preserves located on the east side of the Santa Cruz Mountains. Chaparral comprises approximately 9,945 acres of the Program area.

Oak Savanna Woodland

Oak savanna woodland communities are limited within Midpen lands. These communities are characterized by open canopies dominated by valley oak (*Quercus lobata*) and blue oak (*Q. douglasii*) and grass cover. Shrub layers are absent to sparse, while herbaceous layers are generally well developed in the understory of these communities and similar to adjacent grasslands. Oak savannah dominated by valley oak is considered a sensitive natural community. These communities are limited in distribution within Midpen lands and are generally found in central and southern preserves. Only approximately 125 acres of the Program area is considered oak savanna woodland.

Hardwood Forest

Hardwood forest communities on Midpen lands are present on both the eastern and western slopes of the Santa Cruz Mountains and occupy a variety of topographic positions. Although present in almost every Midpen preserve, these communities are largely concentrated in the central and southern preserves. These communities are generally dominated in the canopy by California bay (*Umbellularia*) and tanoak (*Notholithocarpus densiflorus*), various oak species (*Quercus agrifolia, Q. kelloggii, Q. lobata, Q. douglasii, Q. wislizenii*), madrone (*Arbutus menziesii*), and California buckeye (*Aesculus californica*) or a combination of these species. Stands of California bay codominant with coast live oak (*Quercus agrifolia* var. *agrifolia*) are also present. The shrub and herbaceous layer in these communities are open to sparse. California bay and tanoak are susceptible to sudden oak death and hardwood forest communities have been impacted by the pathogen (*Phytophthora ramorum*). Despite their fairly widespread distribution on Midpen lands, many of the hardwood forest communities present are considered sensitive natural communities. Approximately 18,570 acres within the Program area are hardwood forest.

Conifer Forest

This community is widely distributed within Midpen lands although more common in the northern reaches on the west side of the Santa Cruz Mountains. The community is dominated or co-dominated by Douglas-fir (*Pseudotsuga menziesii*), knobcone pine (*Pinus attenuata*), and/or coast redwood (*Sequoia sempervirens*). Other species are often present and sometimes codominant including golden chinquapin (*Chrysolepis chrysophylla*), California bay (*Umbellularia californica*), coast live oak (*Quercus agrifolia*), and tanoak (*Notholithocarpus densiflorus*), among others. Shrub and herbaceous layers are variable in these communities, sometimes forming important components of the community, while other times being sparsely present. A more limited type of conifer forest is also present dominated by foothill pine (*Pinus sabiniana*). It is often codominant with bigberry manzanita (*Arctostaphylos glauca*) or canyon live oak (*Quercus chrysolepis*), often occurring on serpentine substrates, though it is not restricted to these soils. When on serpentine soils, it occurs with many species that are rare or uncommon elsewhere. Although widespread, a majority of conifer forest community types that are present on Midpen lands are considered sensitive natural communities. Conifer forest comprises approximately 14,000 acres of the Program area.

Riparian

Riparian communities have a wide distribution within Midpen lands on eastern and western slopes of the Santa Cruz Mountains, although restricted locally to mesic habitats or canyon bottoms. These communities are typically found within canyons or in close proximity to creeks, streams, or seeps. In some cases, the communities qualify as wetland habitats. Due to the close association with streams, these communities tend to occur in linear polygons. These communities are typically dominated or codominated by native species including arroyo willow (*Salix lasiolepis*), big-leaf maple (*Acer macrophyllum*), box elder (*A. negundo*), California sycamore (*Platanus racemosa*), red willow (*Salix lasianndra*), red alder (*Alnus rubra*), and white alder (*Alnus rhombifolia*). Dominant species range from shrubs to large trees. The understory in these communities range from open to impenetrable, depending on the dominant species. Herbaceous layers can be well established to sparse. Due to their localized nature, many of these communities are considered sensitive natural communities. Riparian communities total approximately 1,340 acres of the Program area.

Barren or Rock

The barren or rock type includes only landslides, outcrops, and cliffs. It is not uncommon for this type to occur on serpentine substrates, although it is not necessarily restricted to these soils. Many of these areas lack any substantial vegetative cover due to natural disturbance or extreme topography. These areas are limited in distribution, with a majority of the occurrences being located in Sierra Azul OSP at the southern reach of Midpen land ownership. Approximately 120 acres of landslides, cliffs, and rock outcrops have been mapped in the Program area.

Degraded or Converted

The degraded or converted community type has a wide distribution on Midpen lands, although it is fairly uncommon. These areas tend to be completely dominated by anthropogenic land use – either for residential, agricultural, or economic purposes. These communities are often completely devoid of native species as sparsely vegetated and unvegetated areas or may lack an

identifiable vegetation community due to anthropogenic intervention. Vegetated restoration sites are also included. Approximately 420 acres of the Program area is this community type.

Aquatic Vegetation Communities

Overview

Aquatic vegetation community types and open water without vegetation are present within wetland and water community types as shown in Appendix 4.4. The wetlands areas on Midpen lands are based on vegetation mapping and not on the results of a wetland or jurisdictional delineation. The wetland areas, therefore, represent general areas that contain wetland-associated vegetation and further analysis would be required to determine the boundaries of any jurisdictional wetlands present.

Wetland

Wetlands are the most restricted terrestrial community present on Midpen lands, comprised of just a few occurrences. These communities are mesic by nature, often located along waterways, on the edge of water features, and/or near seeps. Wetland communities are dominated by a variety of wetland restricted herbaceous species including sedge (*Carex* spp.), rush (*Juncus* spp.), meadow barley (*Hordeum barchycarpum*), bulrush (*Schoenoplectus* spp.), and cattail (*Typha* spp.). Soils in these communities are poorly drained and often have thick organic layers (Sawyer *et al.* 2009). These communities usually do not have shrub or tree layers, although these other types of communities may occur in close proximity to riparian communities or have emergent willows or other riparian trees present in very low numbers. Many of these communities are considered sensitive natural communities. Approximately 200 acres of wetland community types are found in the Program area.

Water

The water type is limited in distribution on Midpen lands. Unvegetated aquatic communities that occupy permanent non-flowing water features include reservoirs and ponds. Ponds are similar to open water in many aspects, with the exception that ponds may not contain water year-round and can be ephemeral in nature. These areas are unvegetated to sparsely vegetated aquatic communities that occupy low-lying areas and depressions. When present, sparse vegetation may be comprised of duckweed (*Lemna* spp.) and/or mosquito fern (*Azolla* spp.). Dominated by open water, what little vegetation is present is comprised of floating, non-rooted species, including duckweed, mosquito fern, water-thyme (*Hydrilla verticillata*), Eurasian water milfoil (*Myriophyllum spicata*), and water primrose (*Ludwigia hexapetala, L. peploides*). Water bodies comprise approximately 120 acres within the Program area.

Common Wildlife

Common wildlife species are defined as those that have no special status of any kind. Numerous common wildlife species are expected to occur on Midpen lands (Natural Resources Database 2019). Table 4.4-2 includes a list of some of the more prevalent and well-known common vertebrate species but is by no means a comprehensive accounting of all wildlife that may be present on Midpen lands.

Table 4.4-2 Representative Common Species That May Occur on Midpen Lands

Common Name	Scientific Name
Birds	
Acorn woodpecker	*Melanerpes formicivorus*
American coot	*Fulica americana*
American crow	*Corvus brachyrhynchos*
Anna's hummingbird	*Calypte anna*
Barn owl	*Tyto alba*
Barn swallow	*Hirundo rustica*
Bushtit	*Psaltriparus minimus*
California quail	*Callipepla californica*
California scrub-jay	*Aphelocoma californica*
Chestnut-backed chickadee	*Poecile rufescens*
Common merganser	*Mergus merganser*
Dark-eyed junco	*Junco hyemalis*
Great horned owl	*Bubo virginianus*
Mallard	*Anas platyrhynchos*
Northern flicker	*Colaptes auratus*
Pacific slope flycatcher	*Empidonax difficilis*
Red-shouldered hawk	*Buteo lineatus*
Red-tailed hawk	*Buteo jamaicensis*
Red-winged blackbird	*Agelaius phoeniceus*
Steller's jay	*Cyanocitta stelleri*
Turkey vulture	*Cathartes aura*
Mammals	
Black-tailed jackrabbit	*Lepus californicus*
Bobcat	*Lynx rufus*
Botta's pocket gopher	*Thomomys bottae*
Brush rabbit	*Sylvilagus bachmani*
California ground squirrel	*Otospermophilus beecheyi*
California myotis	*Myotis californicus*

Common Name	Scientific Name
California pocket mouse	*Peromyscus californicus*
California vole	*Microtus californicus*
Coyote	*Canis latrans*
Deer mouse	*Peromyscus maniculatus*
Gray fox	*Urocyon cinereoargenteus*
House mouse	*Mus musculus*
Mexican free-tailed bat	*Tadarida brasiliensis*
Mule deer	*Odocoileus hemionus*
Raccoon	*Procyon lotor*
Striped skunk	*Mephitis*
Virginia opossum	*Didelphis virginiana*
Western gray squirrel	*Sciurus griseus*
Reptiles	
California alligator lizard	*Elgaria multicarinata*
California kingsnake	*Lampropeltis getula californiae*
Coast gartersnake	*Thamnophis elegans terrestris*
Coast range fence lizard	*Sceloporus occidentalis bocourtii*
Northern pacific rattlesnake	*Crotalus oreganus*
Pacific gopher snake	*Pituophis catenifer*
Red-eared slider*	*Trachemys scripta elegans*
Skilton's skink	*Plestiodon skiltonianus*
Amphibians	
American bullfrog*	*Lithobates catesbeianus*
Arboreal salamander	*Aneides lugubris*
California newt	*Taricha torosa*
California slender salamander	*Bastrachoseps attenuatus*
California toad	*Anaxyrus boreas halophilus*
Sierran tree frog	*Pseudacris sierra*
Yellow-eyed ensatina	*Ensatina escscholzii xanthoptica*

Common Name	Scientific Name

Notes:
*Denotes non-native species

Critical Habitat

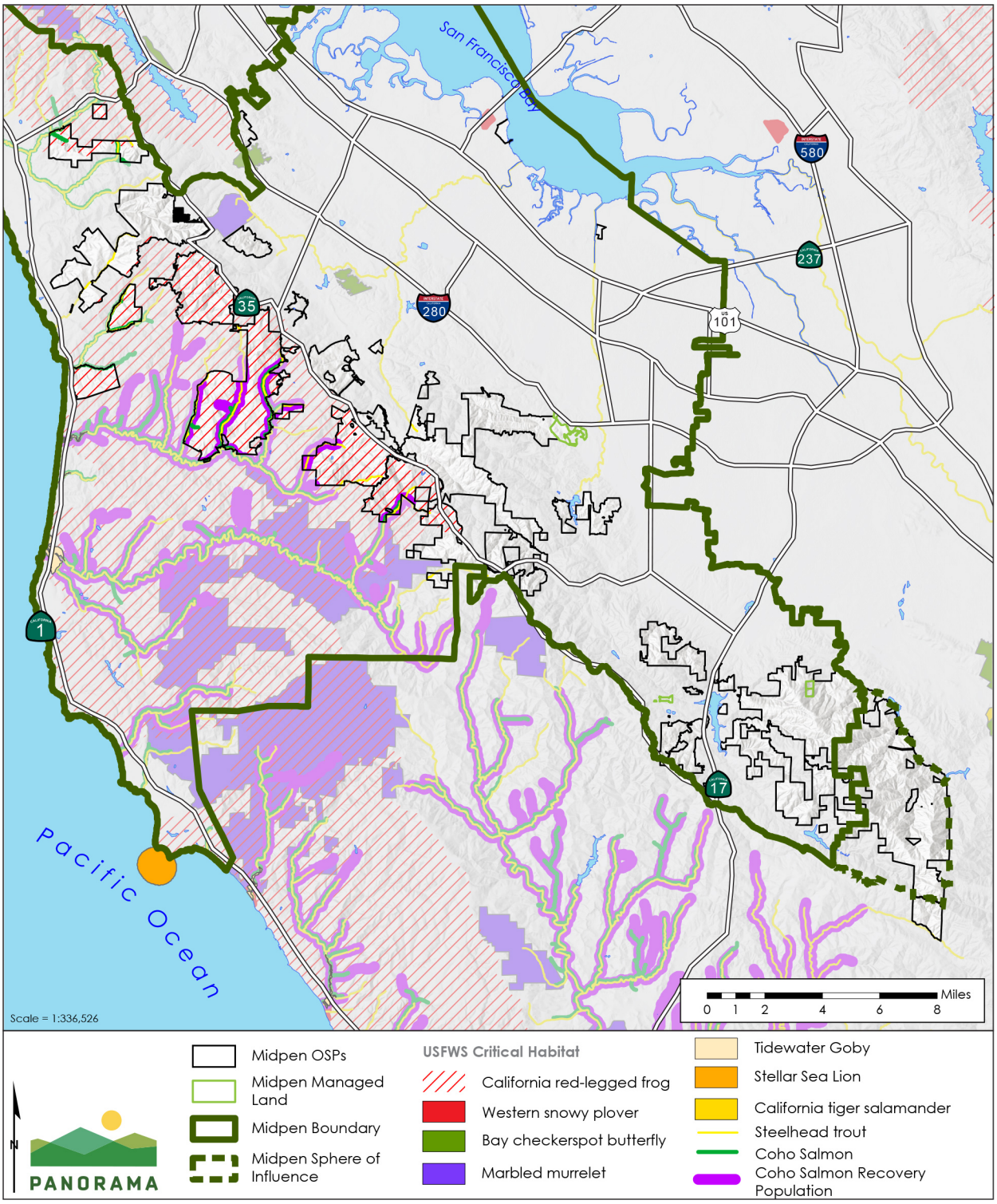
Figure 4.4-3 shows the critical habitat areas in and around Midpen lands. Much of the northern portion of Midpen lands fall within California red-legged frog Critical Habitat Units SNM-1 and SNM-2 (USFWS 2010), including all or nearly all of El Corte Madera Creek, La Honda Creek, Russian Ridge, Skyline Ridge, and Tunitas Creek OSPs, and portions of Miramontes Ridge, Purisima Creek Redwoods, Windy Hill, Coal Creek, Monte Bello, and Long Ridge OSPs.

A very small portion of Midpen lands fall within designated critical habitat for marbled murrelet (USFWS 2011). A sliver of land within Purisima Creek Redwoods OSP immediately west of Skyline Boulevard falls within Unit CA-13. This area is roughly 1,100 feet long and at most 250 feet wide, and totals approximately 3.3 acres. Critical Habitat Unit CA-14a is located immediately adjacent to Midpen lands, bordering Long Ridge OSP and Skyline Ridge OSP.

Streams that have been designated as critical habitat for California central coast Evolutionary Significant Unit (ESU) of steelhead (NOAA Fisheries 2005) are present in Miramontes Ridge, Purisima Creek Redwoods, Tunitas Creek, La Honda Creek, Russian Ridge, Los Trancos, Skyline Ridge, Long Ridge, and Windy Hill OSPs. Streams designated as critical habitat for California central coast evolutionarily significant unit (ESU) coho salmon (NOAA Fisheries 1999) are present in Miramontes Ridge, Tunitas Creek, La Honda Creek, and Skyline Ridge OSPs. The entirety of San Francisco Bay and its adjacent tidal marshes and sloughs are designated critical habitat for Southern DPS green sturgeon (*Acipenser medirostris*) (NOAA Fisheries 2009). This area includes nearly all of the tidal marshes and sloughs within Ravenswood OSP as well as the reach of Stevens Creek that is immediately adjacent to Stevens Creek Shoreline Nature Study Area.

Critical habitat for special-status plants does not occur within any Midpen OSPs.

Figure 4.4-3 Critical Habitat Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; USFWS, 2019a; National Marine Fisheries Servive (NOAA Fisheries), 2005)

Regional Habitat Conservation Plans

Santa Clara Valley Habitat Conservation Plan

A very small portion of Midpen lands along the eastern boundary of Sierra Azul OSP are within the mapped Santa Clara Valley Habitat Conservation Plan (HCP) area (ICF International 2012). The HCP covers nine wildlife and nine plant species, listed in Table 4.4-3.

Table 4.4-3 Covered Species of the Santa Clara Valley Habitat Plan

Common Name	Scientific Name
Plants	
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*
Coyote ceanothus	*Ceanothus ferrisiae*
Mount Hamilton thistle	*Cirsium fontinale* var. *campylon*
Santa Clara Valley dudleya	*Dudleya abramsii* ssp. *setchellii*
Fragrant fritillary	*Fritillaria liliacea*
Loma Prieta hoita	*Hoita strobilina*
Smooth lessingia	*Lessingia micradenia* var. *glabrata*
Metcalf Canyon jewelflower	*Streptanthus albidus* ssp. *albidus*
Most beautiful jewelflower	*Streptanthus albidus* ssp. *peramoenus*
Invertebrates	
Bay checkerspot butterfly	*Euphydryas editha bayensis*
Amphibians	
California tiger salamander	*Ambystoma californiense*
Foothill yellow-legged frog	*Rana boylii*
California red-legged frog	*Rana draytonii*
Reptiles	
Western pond turtle	*Actinemys marmorata*
Birds	
Tricolored blackbird	*Agelaius tricolor*
Western burrowing owl	*Athene cunicularia hypugaea*
Least Bell's vireo	*Vireo bellii pusillus*
Mammals	
San Joaquin kit fox	*Vulpes macrotis mutica*

Santa Clara County Regional Conservation Investment Strategy

The Santa Clara County Regional Conservation Investment Strategy (SCCRCIS) was approved in November 2019 and includes goals and objectives for wildlife and habitat conservation (ICF, 2019). The SCCRCIS is a voluntary, non-regulatory, and non-binding conservation planning tool that encompasses some of Midpen's southern lands. The SCCRCIS strategy boundary includes portions of Foothills, Los Trancos, Rancho San Antonio, Monte Bello, Picchetti Ranch, Fremont Older, Saratoga Gap, Long Ridge, El Sereno, Bear Creek Redwoods, and Sierra Azul OSPs. Conservation priorities, including land protection, enhancement, and restoration, are described in the context of their importance for contributing to the conservation and recovery of focal species and their habitats. The SCCRCIS identifies ten wildlife and eight plant focal species, listed in Table 4.4-4. Several of these species overlap with the Santa Clara Valley HCP's covered species, listed in Table 4.4-3.

Table 4.4-4 Focal Wildlife and Plant Species of the Santa Clara County Regional Conservation Investment Strategy

Common Name	Scientific Name
Fish	
Central California Coast steelhead	*Oncorhynchus mykiss*
South-Central California Coast steelhead	*Oncorhynchus mykiss*
Amphibians	
California tiger salamander (Central CA Distinct Population Segment)	*Ambystoma californiense*
Foothill yellow-legged frog	*Rana boylii*
California red-legged frog	*Rana draytonii*
Birds	
Tricolored blackbird	*Agelaius tricolor*
Western burrowing owl	*Athene cunicularia*
Swainson's hawk	*Buteo swainsoni*
Mammals	
San Joaquin kit fox	*Vulpes macrotis mutica*
Mountain lion	*Puma concolor*
Plants	
Congdon's spikeweed	*Centromadia parryi* subsp. *congdonii*
Mount Hamilton thistle	*Cirsium fontinale* var. *campylon*
Tracy's eriastrum	*Eriastrum tracyi*
Fragrant fritillary	*Fritillaria liliacea*

Common Name	Scientific Name
Loma Prieta hoita	*Hoita strobilina*
Smooth lessingia	*Lessingia micradenia* var. *glabrata*
Rock sanicle	*Sanicula saxatilis*
Most beautiful jewelflower	*Streptanthus albidus* subsp. *peramoenus*

Many species that were not selected as focal species for the SCCRCIS have conservation needs similar to the focal species and may also be addressed through other conservation elements in the SCCRCIS. Eight species are included in the SCCRCIS as non-focal species based on the potential need for mitigation credits for these species. Non-focal species include the following:

- Longfin smelt (*Spirinchus thaleichthys*);
- Western pond turtle (*Emys marmorata*);
- Western snowy plover (*Charadrius alexandrinus nivosus*);
- Ridgway's rail (*Rallus obsoletus obsoletus*);
- American badger (*Taxidea taxus*);
- Townsend's big eared bat (*Corynorhinus townsendii*);
- Salt marsh harvest mouse (*Reithrodontomys raviventris*); and
- Hoover's button celery (*Eryngium aristulatum* var. *hooveri*).

Sensitive Natural Communities

Sensitive natural communities are of limited distribution statewide or within a county or region that provides important habitat value to native species. The tables in Appendix 4.4 identify which sensitive natural communities that are known to be present, or have the potential to occur, within the existing or potential treatment areas within Midpen lands. Seventy-five sensitive upland natural communities and 19 sensitive aquatic natural communities have the possibility to occur or are known to be present on Midpen lands. These potentially occurring sensitive natural communities have been identified based on BHS communities included in Midpen's vegetation community spatial data set and by a search of the online Manual of California Vegetation (CNPS, 2020a) for sensitive natural communities that may occur in the Central California Coast Section of California Ecoregions (USDA, 1997). It should be noted that many of these communities occur on serpentine bedrock or soils.

Special-Status Species

Overview

In evaluating habitat suitability for special-status plant and wildlife species to occur within the Program area, relevant literature, knowledge of regional biota, and available occurrence and distribution data were considered. Midpen maintains a GIS database and on-line web-based application that integrates the records Midpen's own past and recent detections of special-status species. Determinations for occurrence potential of special-status species are divided into the four categories described below. These determination categories appear in Appendix 4.4, which provide a summary of the status, habitat affinities, flowering phenology, habitat suitability and

local distribution, and potential for occurrence of each of the special-status species known from the vicinity of Midpen lands.

Special-Status Plant Species

Based on a review of available databases and literature (CDFW 2020a, 2020b, 2020c; CNPS 2020b; CCH1 2020; CCH2 2020; Baldwin et al. 2012; Thomas 1961; Corelli and Chandik 1995); familiarity with the regional flora; and presence of specific vegetation types, a total of 42 special-status plant species were determined to be present or have the potential to occur within Midpen lands (Appendix 4.4). These 42 special-status plant species are noted in Appendix 4.4 as being present or possible. Three of these species are state or federally listed as endangered, threatened, and/or rare: Santa Clara Valley dudleya *(Dudleya abramsii subsp. setchellii),* San Mateo woolly sunflower *(Eriophyllum latilobum),* and Dudley's lousewort *(Pedicularis dudleyi)*. The 37 other special-status plant species are considered rare by CNPS based on having a CRPR of 1, 2, 3, or 4. Habitats where serpentine soils are present generally have a higher potential to support special-status plant species. The locations of documented special-status plant species on Midpen lands are shown in Figure 4.4-4.

Special-Status Wildlife Species

Based on a review of the California Natural Diversity Database (CNDDB) (CDFW 2020a), information provided by Midpen, and other available literature, 71 special-status wildlife species were identified that are known to occur or could possibly occur on Midpen lands, including 12 invertebrates, 4 fish, 6 amphibians, 3 reptiles, 31 birds, and 15 mammals. These species and the literature consulted are identified in Appendix 4.4, along with their regulatory status, habitat requirements, and a short discussion of their occurrence or potential occurrence on Midpen lands. Appendix 4.4 also includes wildlife species that were considered during preparation of this document but are not expected to occur on Midpen lands based on lack of suitable habitat, local extirpations, or other factors. The location of documented special-status wildlife species and designated critical habitat on Midpen lands is shown in Figure 4.4-3 and Figure 4.4-4**.**

Only a few federally or state listed threatened, endangered, or candidate species are known to occur on Midpen lands (or waters within). These species are listed below. The last two in the list, the Ridgeway's rail and salt-marsh harvest mouse, are only found in salt marsh habitats on the bay shoreline.

- Steelhead – central California coast DPS pop. 8 (*Oncorhynchus mykiss irideus*)
- Foothill yellow-legged frog (West/Central coast clade) (*Rana boylii*)
- California red-legged frog (*Rana draytonii*)
- San Francisco garter snake (*Thamnophis sirtalis tetrantaenia*)
- Ridgway's rail *(Rallus obsoletus)*
- Salt-marsh harvest mouse *(Reithrodontomys raviventris)*

Federally or state listed threatened, endangered, or candidate species or state fully protected with potential to occur (but are not currently known to occur) on Midpen lands (or waters within) include:

- Ohlone tiger beetle (*Cicindela Ohlone*)
- Bay checkerspot butterfly (*Euphydryas editha bayensis*)
- Green sturgeon - Southern Distinct Population Segment (DPS) (*Acipenser medirostris*)
- Coho salmon – central California coast ESU pop. 4 (*Oncorhynchus kisutch*)
- Longfin smelt (*Spirinchus thaleichthys*)
- California tiger salamander (*Ambystoma californiense*)
- Tricolored blackbird (nesting colony) (*Agelaius tricolor*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- White-tailed kite *(Elanus leucurus)*
- American peregrine falcon *(Falco peregrinus anatum)*
- Bald eagle *(Haliaeetus leucocephalus)*
- California black rail *(Laterallus jamaicensis coturniculus)*
- Ringtail *(Bassariscus astutus)*

Based on the review of available databases and literature, familiarity with local fauna, and on-site habitat suitability, the special-status wildlife species discussed in detail in Appendix 4.4 are considered to have potential to occur within Midpen lands.

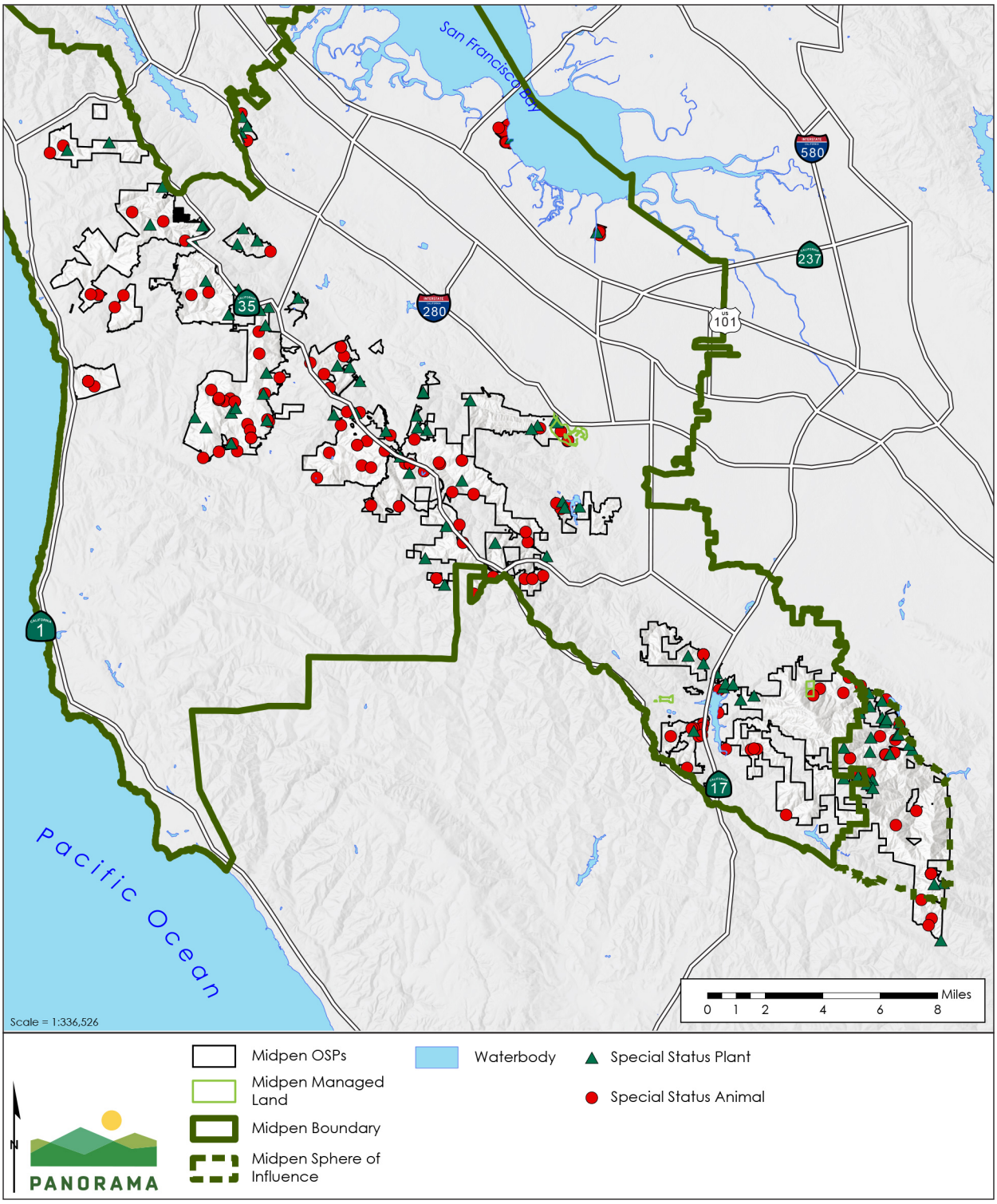
Biological Threats on Midpen Lands

Invasive Plant Species

Invasive species are plant species that invade and dominate sufficiently large areas causing a reduction in biodiversity. They proliferate in the absence of natural control and interfere with the natural processes that would otherwise occur on wildlands. Once established, invasive species can become difficult to manage and can eliminate or outcompete rare, sensitive, or otherwise important native species that are important to maintain a species-rich assemblage, habitat, host plants, food, and cover for wildlife. Although the vast majority of invasive species are non-native, a disruption in disturbance regimes (e.g., natural fire) or influx of outside influences (e.g., nitrogen deposition from anthropogenic activities such as fossil fuel combustion) can cause native species to act invasive.

Invasive plants are implicated in many natural resource and conservation problems and are considered by most land managers to be a threat to natural resource management goals. Some invasive plants can alter ecosystem processes, such as reducing or changing seasonal food sources for wildlife, hydrological patterns, fire regimes, soil chemistry, or the genetic integrity or other species. Several examples of the relationship between invasive species and fire in California and the United States have been studied. A study of 12 invasive grass species found that eight were associated with an increased rate of fire occurrence and six were associated with increased fire frequency (Fusco, Finn, Balch, Ragy, & Bradley, 2019). Mediterranean invasive grasses have been found to spread fast-moving fire into the canopies of larger shrub vegetation (Lambert, D'Antonio, & Dudley, 2010).

Figure 4.4-4 Known Occurrences of Special-Status Species on Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; CDFW, 2020a; CDFW, 2020b)

The San Mateo County Weed Management Area and the Santa Clara County Weed Management Area, in which Midpen is a signatory, set regional priorities for eradication of invasive plants in the San Francisco Bay Area, particularly those for which early action could substantially reduce future risk of ecological impacts.

In 2014, invasive species were mapped as dominating approximately 860 acres (<2 percent) within Midpen OSPs. Not all land within OSPs has been mapped. Prominent invasive species found on the OSPs include French broom, jubata grass (*Cortaderia* sp.), and blue gum eucalyptus (*Eucalyptus globulus*). French broom has the potential to disrupt fire cycles because broom plants grow in dense stands, with inner stems that die back and create flammable fuels that can carry fire to the tree canopy, potentially increasing the intensity and severity of wildland fires.

California's native ecosystems are threatened by large infestations of jubata grass. In cut-over coastal redwood forests, jubata grass suppresses reestablishment of seedling. It is a significant invasive species problem in forestry operations and conservation areas in other countries. In forests, jubata grass can outcompete seedling trees and retard their establishment and growth. It creates a fire hazard with excessive build-up of dry leaves, leaf bases, and flowering stalks. Fire management activities can be complicated by large clumps of jubata by blocking vehicle and human access and by becoming fire hazards themselves.

Although many species of non-native annual grasses are ubiquitous throughout California, and not typically considered noxious, management of these grasses are an important part of land stewardship to reduce fuels and maintain or enhance grassland habitat. Without conservation grazing or other forms of vegetation management, non-native annual grass biomass can build up over time as thatch. Thatch increases the flammable fuels in grassland habitats and helps carry fire. If left unmanaged, thatch buildup can negatively impact and suppress native seed germination, prevent water infiltration into the soil, and alter soil dynamics.

Invasive Animal Species

Invasive animals pose an additional threat to natural resources and biodiversity. Escaped or released domestic animals and other non-native wildlife species can thrive in the favorable climate of the San Francisco Peninsula. Once established in a natural area, they compete for valuable resources and disturb the sensitive balance of natural food webs. Bullfrogs, red-eared sliders, and wild (feral) pigs are examples of invasive introduced animals found within Midpen lands that physically displace or consume the native plants and wildlife that normally inhabit natural areas, or otherwise alter natural processes. Feral pigs have been widespread in the central coast of California since about 1970 and reproduce rapidly, dig up meadows and wetlands, and carry diseases that can affect people and livestock. They eat acorns, bulbs, and roots in soil, and are difficult to control. Feral pigs were abundant in the South Skyline region in the 1990s. Midpen has been trapping feral pigs since 2000 and has substantially reduced their population and damage from their rooting through invasive pest management practices (Midpen, 2014c).

Sudden Oak Death

A plant disease known as SOD is threatening coastal forests in California and Oregon. The disease is caused by the pathogen *Phytophthora ramorum*, which has killed millions of tanoaks (*Notholithocarpus densiflorus*) and oaks (*Quercus* spp.) since it was first discovered in the mid-1990s (California Oak Mortality Task Force 2020). More than 30 native tree and shrub species are susceptible to the pathogen (California Oak Mortality Task Force 2014a). Although most of these species suffer only minor damage (e.g., leaf spots or twig dieback), *P. ramorum* is often lethal to tanoak and oak species. California bay trees (*Umbellularia californica*) greatly contribute to spreading the disease among oaks (California Oak Mortality Task Force 2014b). If oaks dominate the site and are the preferred species, the California Oak Mortality Task Force recommends land managers consider removing California bay trees whose canopies are within 15 feet (4.6 meters) of the trunks of valued oaks (California Oak Mortality Task Force 2014b).

P. ramorum can be transported to new areas when infected plants, infested soil, or contaminated water are moved. *P. ramorum* prefers moist environments and mild temperatures. During wet periods, the organism is most active and most likely to start new infections. Therefore, the risk of spreading the organism is greatest in muddy, wet areas and during rainy weather (California Oak Mortality Task Force 2014b). *P. ramorum* spores can be found in living, dying, or recently dead plants as well as in infested waterways and soil, and may be transported to new areas when infected plant material or infested soil is moved. The pathogen also spreads via wind-blown rain.

SOD has killed over one million native oak and tanoak trees and infests many other forest species in 1 Oregon and 15 coastal California counties. Hundreds of dead tanoak trees and other symptoms of the SOD pathogen are commonly seen on Midpen OSPs, contributing to greater fuel loads. No cure is currently available for SOD, and as with other extensive forest diseases, a strategy may take decades to develop. In 2006, Midpen began its efforts to address SOD impacts by adopting a ten-year Sudden Oak Death Plan to map oak trees on Midpen OSPs that are potentially resistant to the SOD pathogen, treat a selected number of specimen oak trees, and establish collaborative funding for SOD research to help guide land management decisions (Midpen, 2014b). The plan also included a collaborative study of impacts on wildland ecology and recreation, and development of a restoration strategy for heavily infested forests. The disease threatens to degrade the more than 47,000 acres of hardwood forest in the region, of which approximately 18,000 acres occur in Midpen OSPs. Since 2000, SOD has spread from what is believed to be its initial core in the Long Ridge, Saratoga Gap, and Skyline Ridge OSPs in a northerly and easterly direction primarily because of weather conditions.

To date, Midpen employees continue to conduct research, monitor, and manage SOD in accordance with the IPMP. This work occurs on Rancho San Antonio, Monte Bello, El Corte de Madera Creek, Los Trancos, Russian Ridge, Skyline Ridge, Long Ridge, and Saratoga Gap OSPs. Because the long-term effects of the disease on California's forests are unknown, Midpen is also currently working with the California Oak Mortality Task Force to further study and monitor the impacts of the disease. Research into SOD treatment options was conducted at Rancho San Antonio, El Corte de Madera, and Los Trancos OSPs. The research evaluated the success of

three scenarios: removal of California bay; application of fungicide; and not conducting any treatment. Ongoing treatment is continuing at El Corte de Madera OSP, with one more fungicide application projected to occur in 2020. Midpen educates the public and staff on SOD prevention techniques in addition to supporting outreach and monitoring efforts conducted by University of California Berkeley and Oregon State University.

Fire Suppression

Coastal California ecosystems evolved in the presence of wildland fire (Keeley 2002a). As a result, many components of the original ecosystems cannot survive long periods without wildland fire (Brown and Smith 2000). Wildland fire opens forests for new generations of trees, preserves open grasslands by eliminating encroaching trees and shrubs, and stimulates seed germination and shoot growth in chaparral. The absence of wildland fire can cause a shift in the composition and structure of fire-adapted communities, which not only threatens their biodiversity, but also makes them more susceptible to catastrophic wildland fires (e.g., due to elevated fuel loads).

Historically, wildland fires occurred on the landscape due to lightning strikes. The natural fire regime (which includes the fuel types consumed, frequency and timing of fires, intensity of the fire, and the spatial distribution of individual fire events) was subsequently altered by humans. Native Americans used fire to increase the abundance and accessibility of food resources (Keeley 2002a). For example, scientists have hypothesized that Native Americans used fire to increase prey (e.g., deer) and seed, bulb, and fruit resources (Keeley 2002a). Euro-American settlers sustained and expanded the fire management practices initiated by Native Americans (Keeley 2002a). Euro-American settlers introduced two phenomena that would subsequently have widespread impacts on ecosystems: exotic plants and livestock.[4]

More recently, humans have altered the natural fire regime through the suppression and exclusion of fire. In many vegetation communities, decades of fire suppression and exclusion have increased vegetation density, altered species composition, and resulted in unnaturally high fuel loads. Wildland fires in these communities can have devasting effects on humans and the ecological environment (D'Antonio and Vitousek 1992). The adverse effects of fire suppression and other land use practices have been compounded by alien plant invasions, habitat fragmentation, and climate change (Dutta 2018). The synergistic interaction of these variables in some communities has created a positive feedback loop characterized by more frequent fire and further dominance by invasive species (D'Antonio and Vitousek 1992, Keeley et al. 2011). For example, exotic annual grasses that colonized California's perennial grasslands provided the fine fuel necessary for the initiation and propagation of fire. Fires then increased

[4] Although the spread of species into new areas can occur naturally, the rate of introduction, escape from cultivation, and subsequent spread of non-native plants in California increased tremendously with the influx of Euro-American settlers (Klinger et al. 2006).

in frequency, area, and perhaps intensity (D'Antonio and Vitousek 1992). Exotic grasses recover from wildland fire more rapidly than natives, thus furthering their dominance and the grassland's susceptibility to fire. Altered fire regimes and other human-induced forms of disturbance have resulted in fire-prone ecosystems, some of which are dominated by exotic plants. Some of these ecosystems (especially grasslands) appear to have reached a stable state (Stylinski and Allen 1999, Thompson et al. 2009, Mordecai et al. 2015). These ecosystems are unlikely to recover to their pre-disturbance state without human intervention (D'Antonio and Vitousek 1992, D'Antonio et al. 2002, Stromberg et al. 2007).

The adverse effects of fire suppression are evident on Midpen lands. For example:

- Forest canopy closure and the lack of fire is threatening persistence of Kings Mountain manzanita (*Arctostaphylos regismontana*), a rare plant that is limited to the northern portion of the Santa Cruz Mountains.
- Dense tangles of brush and young trees have largely replaced the park-like understory beneath redwood and Douglas-fir forests.
- Grasslands and oak woodlands are decreasing due to the spread of brush and forest species.
- Coastal scrub and chaparral communities are aging with minimal new growth.
- Due to their association with water, riparian systems can act as a buffer against fire and therefore as a refuge for fire-sensitive species (Pettit and Naiman 2007). However, decades of fire suppression have altered the health and structure of some of the riparian communities on Midpen lands. These communities are now susceptible to high-intensity crown fires and could become corridors for fire movement under some circumstances (Neary et al. 2005, Pettit and Naiman 2007).

4.4.4 Regulatory Setting

Federal

Federal Endangered Species Act

FESA provides legislation to protect federally listed plant and animal species. USFWS also designates critical habitat for Endangered or Threatened species under FESA. A critical habitat designation protects areas that are necessary for the conservation of the species. Section 9 of the FESA (50 CFR 17.3) prohibits the take, possession, sale, or transport of any FESA-listed species. Take is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, capture, collect, or attempt to engage in any such conduct" (16 U.S. Code [USC] Section 1532[19]). Federal regulation 50 CFR 17.3 further defines the term harm in the take definition to mean any act that actually kills or injures a federally listed species, including significant habitat modification or degradation. For plants, the FESA prohibits removing, possessing, maliciously damaging, or destroying any listed plant on areas under federal jurisdiction, and removing, cutting, digging up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 USC Section 1538[a][2][B]).

Section 7 of FESA requires that all federal agencies must, in consultation with USFWS and/or National Marine Fisheries Service (NMFS), ensure that the agency's actions do not jeopardize the continued existence of a listed species or destroy or adversely modify the listed species' "critical habitat." Section 10 of the Act, on the other hand, authorizes issuance of take permits by USFWS/NMFS to non-federal project proponents. Three types of permits are issued under Section 10:

- **Section 10(a)(1)(A) Recovery Permits and Interstate Commerce Permits**: Recovery and interstate commerce permits are issued to allow for take as part of activities intended to foster the recovery of listed species. A typical use of a recovery permit is to allow for scientific research on a listed species in order to understand better the species' long-term survival needs. Examples include abundance surveys, genetic research, relocations, capture and marking, and telemetric monitoring. Interstate commerce permits also allow transport and sale of listed species across state lines (e.g., for recovery purposes such as a breeding program).
- **Section 10(a)(1)(B) Incidental Take Permits**: Incidental take permits may be sought when a non-federal entity believes their otherwise lawful activities may result in take of endangered or threatened animal species. An HCP must accompany an application for an incidental take permit. The HCP associated with the permit ensures that the effects of the authorized incidental take are adequately minimized and mitigated.
- **Enhancement of Survival Permits:** This type of permit is issued to non-federal landowners participating in Safe Harbor Agreements or Candidate Conservation Agreements with Assurances. These agreements encourage landowners to take actions to benefit species while also providing assurances that they will not be subject to additional regulatory restrictions as a result of their conservation actions.

Midpen currently holds Section 10(a)(1)(A) Recovery Permits for San Francisco garter snake and California red-legged frog. The Biological Opinion on the issuance of the permit also addresses marbled murrelet, Bay checkerspot butterfly, and Santa Clara Valley dudleya. Current vegetation management actions under the IPMP are carried out under these permits where they have a recovery nexus, otherwise full avoidance is implemented. Midpen is currently re-evaluating and revising their programmatic FESA permitting to address a wide range of activities on Midpen lands, including the activities that would be included under the Program.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) is administered by USFWS and implements four treaties between the U.S. and Canada, Mexico, Japan, and Russia, respectively, to manage and conserve migratory birds that cross national borders. The MBTA makes it unlawful in any manner, unless expressly authorized by permit pursuant to federal regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export at any time, or in

any manner, any migratory bird, or any part, nest, or egg of any such bird. The definition of "take" referred to by MBTA is defined as any act to "pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect." This includes most actions, direct and indirect, that could result in "take" or possession, whether temporary or permanent, of any protected species (APLIC and USFWS 2005). Although harassment and habitat modification do not constitute a take in themselves under MBTA, such actions that result in direct loss of birds, nests, or eggs including nest abandonment or failure, are considered take under such regulations.

A list of migratory birds protected under MBTA is available in Section 10.13 of Title 50 of the CFR. Several of these species are found on Midpen lands. The MBTA would apply to vegetation management actions that could impact protected birds or their nests.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) declares it is illegal to take bald eagles, including their parts, nests, or eggs unless authorized. "Take" is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." Disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause injury to an eagle, a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or nest abandonment. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment. Bald eagles are known to nest in the region and could occur on Midpen lands. Activities conducted under the Program must comply with BGEPA.

Clean Water Act of 1977

The U.S. Army Corps of Engineers (USACE) has jurisdiction over waters of the U.S. Waters of the U.S. are classified as wetlands, navigable water, or other waters and include marine waters, tidal areas, stream channels, and associated wetlands. Under federal regulations, wetlands are defined as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs, and similar areas. USACE does not consider "isolated" wetlands (i.e., waters not connected to navigable waters) to be waters of the U.S.

Section 404 of the Federal Clean Water Act (CWA) requires a project applicant to obtain a permit before engaging in any activity that involves any discharge of dredged or fill material into waters of the U.S., including wetlands. Fill material is material placed in waters of the U.S. where the material has the effect of replacing any portion of a water of the U.S. with dry land, or changing the bottom elevation of any portion of a water of the U.S. Waters of the U.S. include navigable waters; interstate waters; all other waters where the use, degradation, or destruction of the waters could affect interstate or foreign commerce; relatively permanent tributaries to any

of these waters; and wetlands adjacent to these waters. Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Potentially jurisdictional wetlands must meet three wetland delineation criteria: hydrophytic vegetation, hydric soil types, and wetland hydrology. Wetlands that meet the delineation criteria may be jurisdictional under Section 404 of CWA pending USACE verification.

Under Section 401 of the CWA, an applicant for a Section 404 permit must obtain a certificate from the appropriate state agency stating that the intended dredging or filling activity is consistent with the state's water quality standards and criteria. In California, the authority to grant water quality certification is delegated by the SWRCB to the nine RWQCB.

Midpen generally relies on Nationwide Permits and individual permits for any work that could result in a placement of fill into a water of the U.S. Implementation of the Program would generally avoid jurisdictional waters, but if fill were to occur (e.g., for a stream crossing or to install new fire protection infrastructure under the Pre-Fire Plan), 404 and 401 permits would be required. 404 and 401 permits have not been obtained for the limited vegetation management activities that occur under the IPMP, but are being discussed for inclusion through Midpen's current programmatic efforts with USACE.

State

California Endangered Species Act

CESA provides protection for candidate plants and animal species as well as those listed as threatened or endangered by CDFW. CESA prohibits the take of any such species unless authorized; however, California case law has not interpreted habitat destruction, alone, as included in the state's definition of take. Take is defined in the Fish and Game Code § 86 as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill" (California Fish and Game Code § 86). CDFW administers the act and authorizes take through § 2081 agreements, § 2080.1 consistency determinations (for species that are also listed under the federal ESA), or Natural Communities Conservation Plan (NCCP).

Midpen currently has a Memorandum of Understanding (MOU) with CDFW describing measures that will avoid take of San Francisco garter snake and California tiger salamander for activities that are performed on their lands. This agreement is being revisited as part of Midpen's programmatic permitting effort. Midpen also maintains a Scientific Collecting Permit for state listed special-status reptiles and amphibians.

Public Resources Code

PRC section 21083.4 requires that counties within California must determine whether a project may result in the conversion of oak woodlands that would have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county must require mitigation for the effects to oak woodlands. Oak woodland habitat occurs within the Program area. Impacts on oak woodlands would be subject to PRC section 21083.4.

Fish and Game Codes

Wetlands and Nesting Birds

Fish and Game Code governs state-designated wetlands, including riparian and stream habitat, and mandates that mitigation be implemented to replace wetland extent and value lost to development. Sections 1600–07 of the Fish and Game Code regulate activities that would alter the flow, substantially change or use any materials from the bed, channel, or bank of any river, stream, or lake, or dispose of any debris. Activities that affect these areas, as well as associated riparian habitats, require a Streambed Alteration Permit from CDFW.

Midpen currently holds a Routine Maintenance Agreement under the California Fish and Game Code Section 1602, Lake or Streambed Alteration Agreement, which is valid through 2024. Midpen is revisiting this permit to clearly address activities under the IPMP and Program.

Section 3503 of the Fish and Game Code prohibits impacts on actively nesting birds, their nests, or their eggs. Any activities under the Program that could impact nesting birds and their eggs are subject to this regulation.

Fully Protected Species (Fish and Game Code sections 3511, 4700, 5000, 5050, 5515)

The classification of a species as fully protected provides protection to rare, Threatened, or Endangered species. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock. Appendix 4.4 identifies the state Fully Protected species that could occur in the Program area. Impacts to these species need to be avoided to ensure compliance with the regulations.

Porter-Cologne Water Quality Control Act and Section 401 of the Clean Water Act

The California Water Quality Control Board administers the Porter-Cologne Water Quality Control Act and Section 401 of the CWA. The Porter-Cologne Water Quality Control Act requires that "any person discharging waste, or proposing to discharge waste, within any region that could affect the 'waters of the state' to file a report of discharge" with the local RWQCB. Waters of the state as defined in the Porter-Cologne Act are "any surface water or groundwater, including saline waters, within the boundaries of the state."

Pursuant to Section 401 of the CWA, RWQCB consider waters of the state to include, but not be limited to, rivers, streams, lakes, bays, marshes, mudflats, unvegetated seasonally ponded areas, drainage swales, sloughs, wet meadows, natural ponds, vernal pools, diked bay lands, seasonal wetlands, and riparian woodlands. RWQCB has also claimed jurisdiction and exercised discretionary authority over "isolated waters."

Midpen had, until June 30, 2018, a Waste Discharge Requirement/Routine Maintenance Agreement under the California Porter-Cologne Water Quality Control Act. RWQCB staff requested Midpen obtain a regional general permit from the Army Corps to ensure impacts to state and federal waters under Porter-Cologne and Clean Water Act are covered by a future programmatic agreement. Midpen has been applying for individual permits since the agreement expired and is working on a renewed agreement. Any impacts from Program

activities to waters of the State that are not covered by a federal permit would require a Waste Discharge Requirement/Routine Maintenance Agreement.

Local

Midpeninsula Regional Open Space District – Resource Management Policies
Midpen's resource management includes management of natural, cultural, and agricultural resources. Midpen recognizes the protection of biological resources as one of the primary benefits of open space (Midpen, 2014a). The following strategy, goals, and policies relate to biological resources and the Program must be consistent with and support these strategies, policies, and goals:

Strategy 4 Protect and restore known rare, endangered, special-status species and sensitive habitats, as well as seriously degraded or deteriorating areas. Give priority to sensitive habitats and consider the relative scarcity of the specific resources involved.

Goal VM Sustain and promote viable and diverse native plant communities characteristic of the region.

Policy VM-1 Maintain the diversity of native plant communities.

Policy VM-2 Use native species occurring naturally on similar sites in ecological restoration projects.

Policy VM-3 Protect and enhance the habitats and populations of special-status plant species.

Policy VM-4 Manage forest diseases, when necessary, to protect native biological diversity and critical ecosystem functions.

Goal WM Maintain and promote healthy and diverse native wildlife populations.

Policy WM-1 Understand and maintain the diversity of native wildlife.

Policy WM-2 Protect, maintain, and enhance habitat features that have particular value to native wildlife.

Policy WM-3 Protect animal populations against the impact of human actions.

Policy WM-4 Protect and enhance the habitats and populations of special-status animal species.

Goal ES Use sustainable land management techniques to maintain, restore, or simulate natural disturbance in priority habitats.

Policy ES-2 Preserve and enhance pond habitats and other wetlands.

Policy ES-3	Facilitate regeneration of disturbance-dependent special-status, rare, or unique plants.
Goal HC	Protect ecosystem integrity by maximizing habitat connectivity.
Policy HC-2	Identify and protect existing habitat networks to prevent further compromise to ecosystem integrity.
Policy HC-3	Collaborate with neighboring land holders and surrounding agencies to support regional efforts to establish and maintain habitat networks.
Policy HC-4	Restore, maintain, or enhance local habitat networks formed within or incorporating Preserves and other protected lands.
Policy HC-5	Preserve and enhance riparian, stream, and other wetland habitat locally and at a watershed level to provide important habitat connections.

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014b). The following themes and goals pertain to the biological resources within Midpen lands that the Program must be consistent with and support:

Stewardship:

- Restore the natural environment, control invasive plants and animals, and limit the spread of pathogens
- Promote natural ecosystem processes
- Protect watersheds and restore stream flow to improve habitat for fish and wildlife

Biodiversity:

- Protect large contiguous areas of intact habitat that represent the Peninsula and South Bay's full mosaic of natural communities
- Conserve sensitive species and special natural communities

Connectivity:

- Increase connectivity between protected areas to support natural wildlife movement patterns

San Mateo County – General Plan

Midpen lands, including the ones that are a part of this Program, within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals and objectives regarding Vegetative, Water, Fish, and Wildlife Resources Policies in the San

Mateo County General Plan are applicable to biological resources on Midpen lands (San Mateo County, 2013):

1.1 **Conserve, Enhance, Protect, Maintain and Manage Vegetative, Water, Fish, and Wildlife Resources.** Promote the conservation, enhancement, protection, maintenance, and managed use of the County's Vegetative, Water, Fish, and Wildlife Resources.

1.2 **Protect Sensitive Habitats.** Protect sensitive habitats from reduction in size or degradation of the conditions necessary for their maintenance.

1.3 **Protection and Productive Use of Economically Valuable Vegetative, Water, Fish, and Wildlife Resources.** Protect the availability and encourage the productive use of the County's economically valuable vegetative, water, fish, and wildlife resources in a manner which minimizes adverse environmental impacts.

1.4 **Access to Vegetative, Water, Fish, and Wildlife Resources.** Protect and promote existing rights of public access to vegetative, water, fish, and wildlife resources for purposes of study and recreation consistent with the need to protect public rights, rights of private property owners and protection and preservation of such resources.

Santa Clara County – General Plan

Midpen lands, including the lands that are a part of this Program within Santa Clara County, are subject to the stipulations outlined in the Santa Clara County General Plan. The Resource Conservation Chapter of the Santa Clara County General Plan includes the following strategies and policies for preserving and enhancing biological resources that are relevant to the Program activities (Santa Clara County, 1994):

C-RC 27 Habitat types and biodiversity within Santa Clara County and the region should be maintained and enhanced for their ecological, functional, aesthetic, and recreational importance.

C-RC 28 The general approach to preserving and enhancing habitat and biodiversity countywide should include the following strategies:

Improve current knowledge and awareness of habitats and natural areas.
Protect the biological integrity of critical habitat areas.
Encourage habitat restoration.
Evaluate the effectiveness of environmental mitigations.

C-RC 29 Multi-jurisdictional coordination necessary to adequately identify, inventory, and map habitat types should be achieved at the local, regional, state, and federal levels.

C-RC 31 Areas of habitat richest in biodiversity and necessary for preserving threatened or endangered species should be formally designated to receive greatest priority for preservation, including baylands and riparian areas, serpentine areas, and other habitat types of major significance.

C-RC 32 Land uses permitted in resource conservation areas should not be allowed to degrade the integrity of natural habitat.

C-RC 33 Linkages and corridors between habitat areas should be provided to allow for migration and otherwise compensate for the effects of habitat fragmentation.

C-RC(i)13 Acquisition of areas of significance through the County's Open Space Authority, MROSD[5], County Parks, National Wildlife Refuge, and other agencies and non-profit organizations for permanent preservation.

C-RC 34 Restoration of habitats should be encouraged and utilized where feasible, especially in cases where habitat preservation and flood control, water quality, or other objectives can be successfully combined.

C-RC(i)15 Explore opportunities for restoration of habitat, particularly with respect to wetland, riparian, and other habitat types rich in diversity or needed to protect threatened and endangered species.

C-RC 35 The status of various threatened and endangered species and the effectiveness of strategies and programs to preserve biodiversity should be monitored and evaluated on an ongoing basis.

Santa Cruz County – General Plan

Midpen lands, including the lands that are a part of this Program within Santa Cruz County, are subject to the stipulations outlined in the Santa Cruz County General Plan. Chapter 5, Conservation and Open Space, of the Santa Cruz County General Plan contains the following policies related to the Program for biological resources (Santa Cruz County, 1994):

5.1.1 **Sensitive Habitat Designation.** Designate the following areas as sensitive habitats: (a) areas shown on the County General Plan and LCP[6] Resources and Constraints Maps; (b) any undesignated areas which meet the criteria (policy 5.1.2) and which are identified through the biotic review process or other means; and (c) areas of biotic concern as shown on the Resources

[5] MROSD: Midpeninsula Regional Open Space District

[6] LCP: Local Coastal Program

and Constraints Maps which contain concentrations of rare, endangered, threatened or unique species.

5.1.6 **Development Within Sensitive Habitats.** Sensitive habitats shall be protected against any significant disruption of habitat values; and any proposed development within or adjacent to these areas must maintain or enhance the functional capacity of the habitat. Reduce in scale, redesign. or, if no other alternative exists, deny any project which cannot sufficiently mitigate significant adverse impacts on sensitive habitats unless approval of a project is legally necessary to allow a reasonable use of the land.

5.1.7 **Site Design and Use Regulations.** Protect sensitive habitats against any significant disruption or degradation of habitat values in accordance with the Sensitive Habitat Protection ordinance. Utilize the following site design and use regulations on parcels containing these resources, excluding existing agricultural operations:

1. Structures shall be placed as far from the habitat as feasible.
2. Delineate development envelopes to specify location of development in minor land divisions and subdivisions.
3. Require easements, deed restrictions, or equivalent measures to protect that portion of a sensitive habitat on a project parcel which is undisturbed by a proposed development activity or to protect sensitive habitats on adjacent parcels.
4. Prohibit domestic animals where they threaten sensitive habitats.
5. Limit removal of native vegetation to the minimum amount necessary for structures, landscaping, driveways. septic systems and gardens.
6. Prohibit landscaping with invasive or exotic species and encourage the use of characteristic native species.

5.1.8 **Chemicals Within Sensitive Habitats.** Prohibit the use of insecticides, herbicides, or any toxic chemical substance in sensitive habitats, except when an emergency has been declared, when the habitat itself is threatened. When a substantial risk to public health and safety exists, including maintenance for flood control by Public Works, or when such use is authorized pursuant to a permit issued by the Agricultural Commissioner.

5.1.9 **Biotic Assessments.** Within the following areas, require a biotic assessment as part of normal project review to determine whether a full biotic report should be prepared by a qualified biologist:

1. Areas of biotic concern, mapped;
2. Sensitive habitats, mapped & unmapped.

5.1.10 **Species Protection.** Recognize that habitat protection is only one aspect of maintaining biodiversity and that certain wildlife species, such as migratory birds, may not utilize specific habitats. Require protection of these individual rare, endangered, and threatened species and continue to update policies as new information becomes available.

5.1.11 **Wildlife Resources Beyond Sensitive Habitats.** For areas which may not meet the definition of sensitive habitat contained in Policy 5.1.2, yet contain valuable wildlife resources (such as migration corridors or exceptional species diversity), protect these wildlife habitat values and species using the techniques outlined in policies 5.1.5 and 5.1.7 and use other mitigation measures identified through the environmental review process.

4.4.5 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on biological resources would be considered significant if they would exceed the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;
- Have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, or State HCP.

(See CEQA Guidelines, Appendix G, I.)

Analysis Methodology

Evaluation of potential impacts on biological resources is based on prior environmental and scientific evaluations, as well as spatial and other data maintained by Midpen. Relevant databases were also reviewed, including the 2020 version of the CNDDB. The CNPS Electronic Inventory or Rare and Endangered Plants and the USFWS database of special-status species were also reviewed for species that could occur in the Program area. Midpen's botanical and wildlife staff were consulted regarding the known distribution of sensitive biological resources on Midpen lands in the Program area.

Midpen is currently working with regulatory agencies to update their programmatic permits, which addresses all types of routine maintenance across multiple programs undertaken by Midpen. The Program activities, including activities identified in the VMP, the PFP, and infrastructure that could be installed under the Pre-Fire Plan are all being incorporated into the programmatic permitting effort in order to comprehensively address impacts to listed species and identify streamlined permitting mechanisms for potential impacts to state and federally listed and sensitive species, sensitive habitats, and State and federal waters. Approaches to classifying impacts used in the programmatic permitting effort are utilized and draft BMPs have been modified into mitigation, where appropriate for this EIR. GIS data maintained by Midpen was compiled and used in the analysis. Key information from Midpen's GIS database was sourced from CNDDB.

The Program covers a multi-year management period during which time biological conditions on Midpen lands will change. For example, the existing mapped populations of weeds may change, and natural events such as fire and landslides may change the distribution of invasive and native plant species. Given the level of this analysis and because biological conditions may change before specific activities are implemented, site-specific surveys would be conducted, as appropriate, prior to the implementation of future management activities (see Section 4.4.7: Mitigation Measures).

4.4.6 Impact Analysis

Impact Biological Resources-1: Substantial adverse effect, either directly or through habitat modifications, on species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.	**Significance Determination**
	Less than significant with mitigation

Analysis of Tools and Techniques

Special-Status Plants

Manual and Mechanical Techniques

Hand Tools and Equipment. The effects of manual and mechanical treatments on particular special-status plant species are dependent on the type, timing, and intensity of the treatment(s); the taxon's specific habitat requirements; and its tolerance to disturbance and environmental perturbations. Some special-status plant species are extremely sensitive to some anthropogenic forms of disturbance (e.g., clustered lady's slipper [*Cypripedium fasciculatum*] or Kings Mountain

manzanita [*Arctostaphylos regismontana*]), whereas others are not (e.g., smooth lessingia [*Lessingia micradenia* var. *glabrata*]) (CNDDB 2020). Appendix 4.4 provides some other examples of how some environmental perturbations caused by Program activities, notably prescribed and pile burning, might affect special-status plant species that occur or potentially occur on Midpen lands. Manual and mechanical techniques could cause mortality of special-status plants if the plants are overcut, or if they are crushed by vehicles, equipment, personnel, slash piles, or felled trees. Vegetative debris (e.g., wood chips) scattered on the substrate, and soil disturbance associated with mechanical equipment, could affect the seedbank of a special-status plant species, positively or negatively depending on the circumstances and species (Saatkamp et al. 2014). Direct loss of special-status plant individuals, populations, or preventing germination could occur.

Manual and mechanical treatments have the potential to cause indirect impacts on special-status plants. Vegetation removal could enhance or degrade the habitat conditions associated with special-status plants. For example, San Francisco collinsia (*Collinsia multicolor*) is a special-status species that grows in areas with partial shade. Thus, the species could be adversely affected by manual or mechanical methods that remove vegetation providing shade for San Francisco collinsia. Use of vehicles and equipment could cause fugitive dust to settle on plants (which can reduce a plant's vigor), start a fire, leak hazardous chemicals (e.g., motor oil), or otherwise alter the environmental conditions the plant needs to persist. Manual and mechanical methods could remove vegetation creating environmental conditions favorable to invasive plants. Invasive plants are a primary threat to most special-status species (U.S. Department of the Interior 2016, CNDDB 2020). Program equipment, vehicles, and personnel could inadvertently transport invasive plant propagules or forest diseases to work sites. Mechanical methods of vegetation removal have the potential to spread forest diseases such as the soil-borne pathogen *Phytophthora cinnamomi,* which is spread through cutting by contaminated equipment.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. IPMP BMP 25 requires pre-treatment surveys to determine the presence of special-status plants, conducted during the appropriate season to assess the occurrence, and of dormant or overwintering plant species that may not be visible during the pre-treatment survey. The BMP also requires that manual and mechanical methods can occur near the special-status species, as long as work does not damage the plant. Midpen also implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status plant species could remain significant; however, as specific activities in the Program (including manual and mechanical removal) may require additional specific protections or avoidance to ensure less than significant impacts. IPMP BMP 25 is incorporated into MM Biology-1 with additional specificity to address Program impacts. MM Biology-1 reduces impacts by requiring a qualified biologist or biological monitor to conduct pre-activity surveys to flag the work area, as appropriate, and identify special-status plants in the area. The measure also requires additional monitoring during work and after completion of the work. Post-work monitoring for

mechanical methods typically occurs immediately after completion of the work to verify no damage to listed plant species. MM Biology-2 requires assigning an impact category to any individual special-status plants identified (no impact, low impact, or moderate to high impact), identifying any site-specific measures to minimize effects per IPMP BMP 25, avoidance for state and federally listed plants that could be negatively impacted by manual and mechanical vegetation treatment methods, and avoidance of some other sensitive plant species (e.g., Santa Clara Valley dudleya, Kings Mountain manzanita) or a stepwise approach to reducing or avoiding impacts for other less sensitive species (e.g., Santa Cruz clover). The stepwise approach would depend upon the listing or ranking status of the species and known rarity on Midpen lands as determined by a biologist/botanist or biological monitor working under a qualified biologist, and may require establishing appropriate avoidance buffers, implementing trimming and hand methods in accordance with protocols, and additional monitoring. For special-status plant species that are permanently and negatively impacted by Program activities (i.e., could not be avoided or benefited through activities and subsequent monitoring determined an adverse effect to the population where a decline in population is attributable to the Program activities), compensatory mitigation under MM Biology-3 would be implemented.

The special-status species that must be avoided to ensure no impacts (e.g., Santa Clara Valley dudleya, Kings Mountain manzanita), are determined by several factors, including very specific habitat requirements and transplanting difficulty. Impacts to other special-status plant species that occur, or potentially occur, on Midpen lands are mitigable because these species have broader habitat requirements and are relatively easy to transplant or propagate. In most instances, either spatial or temporal avoidance would be possible, and would be sufficient to avoid significant impacts to special-status plants. Manual and mechanical methods used to create disclines, and installation of firefighting infrastructure are exceptions, as the level of disturbance would either be permanent or occur on a routine basis. Most special-status plants would not persist under these conditions and would be permanently impacted. Areas where these types of special-status species could occur and overlap with proposed disclines and firefighting infrastructure would be avoided through implementation of MM Biology-2. Disclines, which are typically 10 feet wide and near existing disturbances, and any new infrastructure would need to be positioned to avoid special-status plants that could be permanently impacted, directly or indirectly, and that cannot be translocated or repropagated, per MM Biology-2.

MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases, including comparing work areas to areas of known invasive species or forest diseases prior to conducting the work, and implementing vehicle cleaning between sites. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. Mitigation would ensure that direct and indirect impacts on special-status plant species would be minimized or avoided and compensation for species that cannot be avoided under MM Biology-3 would further ensure impacts are reduced to less than significant levels.

Propane Flaming. Flaming is usually conducted during light rains or on wet days in small areas, typically for maintenance of newly created VMAs to address broom infestations and other non-native seedlings. Although unlikely, propane flaming has the potential to kill special-status seeds or seedlings if any occur in the work area, resulting in a significant impact.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Impacts on special-status plant species could still remain significant. MM Biology-1 reduces impacts by requiring a qualified biologist or biological monitor to conduct pre-activity surveys to flag the work area, as appropriate, and identify special-status plants in the area, as well as conduct monitoring during and post-activity to ensure that any individuals were avoided, as needed. MM Biology-2 (which incorporates IPMP BMP 25) prohibits flaming in close proximity to special-status plants that might be damaged by the flaming activities (i.e., accidentally burned or trampled by the applicator), and would thereby reduce impacts on special-status plant species. The impact on special-status plants from propane flaming would be less than significant with mitigation.

Pile Burning. Pile burning could cause a significant impact if piles are placed on top of, or immediately adjacent to, special-status plants that do not benefit from fire. In addition, pile burning could have a significant indirect impact on special-status plants if invasive plants colonize the burn scars and subsequently spread into the surrounding landscape.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Impacts on special-status plant species could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area, as appropriate, and identify special-status plants in the area and to conduct monitoring during the activity and post-activity. MM Biology-2 (which incorporates IPMP BMP 25) would reduce impacts by prohibiting burn piles within 50 feet of special-status plants unless the species benefits from burning, and either avoidance or a stepwise approach to mitigating impacts that may require compensatory mitigation under MM Biology-3, depending on the species. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species that colonize the burn scar, and would further reduce pile burning impacts. With mitigation, the impacts associated with pile burning would be reduced to less than significant.

Chemical Application

The Program includes limited use of herbicides to control invasive plants and SOD and creates and maintains defensible space and other VMAs. The herbicides proposed for use as part of the Program are the same as those already analyzed and are covered by the IPMP EIR and Addendum (Midpen, 2014c; Midpen, 2019). Although the Program involves higher quantities of herbicides than those analyzed in the IPMP EIR, its implementation would not generate new significant environmental effects due to herbicide use, nor would it increase the severity of significant effects identified in the IPMP EIR. The primary threat that herbicides pose to special-status plants is "herbicide drift," which occurs when air carries pesticide particles or vapors

away from the target plant. These particles or vapors may impact non-target special-status plant species in the immediate vicinity of the target species. In addition to herbicide drift, special-status plants could be significantly impacted by the accidental release of chemicals. For example, vehicles and equipment could leak hazardous materials (e.g., fuel and motor oil), or personnel could accidentally spill herbicides. Herbicide use could significantly impact special-status species.

Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would prevent overspray and drift and would establish a 30-foot buffer around special-status species (IPMP BMPs 1 through 10, and 25). IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Impacts on special-status plant species could still remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area, as appropriate, and identify special-status plants in the area and to conduct during activity and post-activity monitoring. MM Biology-2 (which incorporates IPMP BMP 25) requires either avoidance or a stepwise approach to reducing impacts that may require compensatory mitigation under MM Biology-3, depending on the species. These measures would reduce potentially significant impacts associated with herbicide application to less than significant.

Prescribed Herbivory

Grazing can impact special-status plants through trampling, soil disturbance, consumption of plants, and urine or fecal deposition. Grazing would only be used as pre-treatment and would occur most typically in shrublands and forest understory to reduce fuel loads prior to implementation of manual and mechanical techniques. These impacts can be positive, negative, or neutral depending on the particular plant species, its palatability and sensitivity to disturbance, and whether livestock consume competitively dominant or competitively inferior species (Milchunas et al. 1988). Most studies have been limited to the response of various guilds of species (e.g., annual forbs, perennial grasses, etc.) to grazing. Scant information on the response of individual species, except for native bunchgrasses (e.g., purple needlegrass) and some noxious weed species (e.g., yellow star thistle) is available. Despite the lack of studies on how grazing affects a given special-status plant species, the potential for a significant negative impact appears to be dependent on the type, frequency, intensity, and timing of grazing activities (D'Antonio et al. 2002, Foss 2016, CNDDB 2020).

Midpen will implement a monitoring and an adaptive management approach to grazing treatments conducted under the Program due to the lack of scientific information, and because impacts to a particular species are dependent on a complex interaction of numerous site- and species-specific variables as part of the Program (Heady 1984). The impact on special-status plant species could be significant.

MM Geology-1 would reduce impacts by requiring implementation of design features to minimize erosive effects of livestock trails that could damage or kill special-status plants. MM Biology-2 requires a qualified biologist or biological monitor working under a qualified

biologist to conduct surveys for special-status plants prior to conducting activities under the Program. In accordance with the mitigation, if any special-status plants are present, the biologist will assess the site and Program-specific threats to the species and recommend buffers or other management actions to mitigate the threats. Impacts would be less than significant with implementation of mitigation.

Prescribed Burning

The effect fire has on a special-status plants depends on the type of plant (e.g., herb, shrub) and its maturity, adaptions to fire, and habitat characteristics. It also depends on characteristics of the fire, including its intensity, duration, and timing (in relation to plant phenology). The likelihood of a plant being killed by fire depends upon the amount of heat it receives and the amount of meristematic[7] tissues killed. The temperature reached and the duration of exposure a plant receives during a prescribed fire determines the potential for mortality. Mortality can occur at high temperatures after a short period (Martin 1963), while death at lower temperatures requires a longer exposure (Brown and Smith 2000). Some plant tissues, particularly growing points (meristems or buds), tend to be much more sensitive to heat when they are actively growing and their tissue moisture is high (Brown and Smith 2000). Species with buds and meristems located within plant tissues or by the soil surface are more likely to survive an intense fire than those with exposed or vulnerable meristems.

Many plants recover from fire by sprouting. Shoots originate from dormant buds located on plant parts above the ground surface, or from various levels within the litter, duff, and mineral soil layers. Other plants depend on the seedbank for regeneration. Seeds that are available to recolonize a burned site may originate on-site or off-site. On-site seeds may come from surviving plants, or from seed stored in the soil before the fire. Recolonization from off-site seeds is dictated by the amount of off-site seed, the dispersal mechanism (e.g., wind, water, wildlife), and the distance of the seed source from the burned area. Species that occur on Midpen lands and could benefit from prescribed burning include San Mateo woolly sunflower (*Eriophyllum latilobum*) and California bottle-brush grass (*Elymus californicus*) (refer to Appendix 4.4 for details on species that may benefit from fire). Only in rare occasions is a fire intense enough to eliminate a species and its seedbank. Many of the special-status plant species that occur or potentially occur on Midpen lands are associated with habitats that do not burn naturally at high intensities (e.g., rocky habitats), even under severe conditions. Thus, the primary threats to special-status plants from prescribed fires on Midpen lands would be from those fires that: (a) preclude regeneration of the population because they occur at unnaturally short intervals, or in conjunction with other disturbance events that have additive negative effects on regeneration; (b) have long-term effects on the environmental conditions (e.g., light, water, nutrients) a particular species needs for persistence; (c) enable colonization of exotic plants that compete with the native species; or (d) shift the competitive balance between the

[7] Relating to or denoting a region of plant tissue consisting of actively dividing cells forming new tissue.

species of concern and another species (refer to Appendix 4.4 for details on species that do not thrive with fire).

Prescribed burns have a complex and variable effect on invasive species populations, which in turn would affect special-status plant species, depending on the timing, severity, invasive species present, and location of the burn. Depending upon the timing of implementation, prescribed fire can prevent seed production in invasive species by killing aboveground tissues prior to flowering or seed maturation, kill seeds in litter layer, and enhance productivity of native species. Conversely, high-frequency and repeated burning may accelerate establishment and spread of non-target invasive species, even if the target invasive species population is reduced (Rice & Smith, 2008). Some studies have found that native species increase in burn areas if reasonably abundant, but decrease at sites where the native species were rare with a correlated increase in invasive species (Keeley, Franklin, & D'Antonio, 2011). The burn area would be patrolled by Midpen EDRR crews after the prescribed fire. As part of the Program, Midpen would implement a monitoring and adaptive management approach to prescribed burning conducted under the Program; however, some potential for adverse impacts to special-status plant species could still occur. The direct and indirect impact from prescribed burning on special-status plant species could be significant.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Impacts on special-status plant species could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area, as appropriate, to identify special-status plants in the area, and to monitor during and after the prescribed fire. MM Biology-2 requires avoidance of any plants that could be negatively impacted by prescribed fire and cannot be repropagated or translocated. MM Biology-2 (which incorporates IPMP BMP 25) requires avoidance or a stepwise approach to reducing impacts on other species depending on the activity. For these other species that can be mitigated and where avoidance is not feasible, permanent impacts on special-status plants would be compensated per MM Biology-3. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive plant species and soil pathogens after prescribed fire. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species with a California Invasive Plant Council high rating or designated as noxious that colonize the prescribed fire scar. Implementation of mitigation would reduce the impact from prescribed fires to less than significant.

Access and Vehicle Travel

Vehicle travel would generally be confined to existing roads and trails. However, if vehicles are driven off-road special-status plants could be crushed or removed. Personnel could trample special-status plants while walking off-road or off-trail. Seedlings could be vulnerable to crushing from vehicle travel along temporary access routes. Soil disturbance from vehicle tires could cover individuals with fugitive dust or hinder germination depending upon seasonal conditions. Movement of vehicles, equipment, and personnel across and between OSPs could

transport and spread non-native invasive species or plant pathogens. Direct and indirect impacts on special-status plant species would be potentially significant.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Impacts on special-status plant species could still remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area, as appropriate, and identify special-status plants in the area as well as monitoring during and after activities. MM Biology-2 requires avoidance of any plants that could be negatively impacted by prescribed fire and cannot be repropagated or translocated. MM Biology-2 (which incorporates IPMP BMP 25) requires avoidance or a stepwise approach to reducing impacts on other species depending on the activity. For these other species that can be mitigated and where avoidance is not feasible, permanent impacts on special-status plants would be compensated per MM Biology-3. Implementation of mitigation would reduce the impacts to less than significant levels.

Special-Status Wildlife

Species-Specific Impacts by Tool and Technique

Direct impacts on various special-status animal species could occur from injury or death through direct contact with equipment used for vegetation removal. Noise could also impact animal species, as could smoke from prescribed and pile burns, particularly during species breeding season. Hand-removal methods generally would not have direct impacts on species given the limited noise and limited ground disturbance involved. Most species can move out of harm's way to prevent injury or death from activities performed by hand. Indirect impacts from chemical application to host plants or prey species and to habitat conditions from various techniques could adversely impact species. Table 4.4-5 summarizes the effects by technique and species and identifies the BMPs and mitigation measures to reduce impacts to less than significant levels for each species known to occur or with potential to occur on Midpen lands.

General Habitat Impacts

All the tools and techniques, such as mechanical vegetation removal and prescribed burning, could result in some forms of habitat alteration, ranging from a micro-scale change of small patches of weeds covering as little as 10 square feet, to more substantial changes to forest density, composition, and light from forestry actions. Impacts on habitat would be beneficial in most circumstances as the Program objective is to restore diversity and integrity of ecological processes and would not result in a loss of a substantial amount of foraging or nesting habitat for most special-status species. Nesting birds, including special-status avian species, would have abundant areas to nest, even given management actions that may result in removal of dead trees and thick understory. Only a small fraction of Midpen lands would be impacted by any activities in a year. Midpen biologists may designate areas as refugia to limit the types of methods that can be used during FRA creation to minimize effects on habitat and wildlife. As the Program is implemented, the health of forests and other habitats would improve over time. Healthy ecosystems would provide more native species and diversity and a more diverse prey-base, supporting the overall ecosystem health, likely creating much more benefits to

habitats and improving ecosystem health and resiliency, than impacts that could result from performing the work.

Program activities could have some indirect habitat impacts through introduction of invasive species and forest pathogens that could out compete native plants, leading to conversion of habitat used by special-status animals. More intensive travel and work associated with the increase in level of effort to implement the Program compared to existing fuels and vegetation management efforts could inadvertently result in more spread of forest disease and invasive species resulting in a significant impact. IPMP BMP 21 requires implementation of a training program that would describe special-status species, and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on suitable habitat from spread of invasive species and forest diseases could still occur given the scale and types of activities proposed under the Program. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. Direct and indirect impacts on suitable habitat for special-status wildlife species would be reduced to less than significant with mitigation.

Critical Habitat Impacts

California Red-legged Frog. Much of the northern portions of Midpen lands are located within critical habitat for California red-legged frog and many existing and proposed vegetation treatments are located throughout the same area. The Primary Constituent Elements (PCEs) of California red-legged frog critical habitat are broadly defined as 1) aquatic breeding habitat, 2) non-breeding aquatic and riparian habitat, 3) upland habitat, and 4) dispersal habitat (USFWS 2010). Program activities, including vegetation management and installation of firefighting infrastructure, are expected to occur almost entirely in areas that would be considered upland and/or dispersal habitat, with aquatic habitats generally avoided. Available cover for California red-legged frog would be reduced in areas of treatment due to removal of dense forest understory, shrub thinning, and lower grass height. However, in any one year, the treatment areas would only represent a small fraction of the vegetative cover in any given area, with abundant habitat available elsewhere in the vicinity. Refugia areas can be designated within FRAs by a Midpen-designated biologist as part of the Program, which would limit the types of activities and treatments that could occur. Vegetation management would not introduce new barriers to dispersal that could cause habitat fragmentation. It is feasible that some Program treatments or improvements, such as vegetation thinning and installation of firefighting water source infrastructure, could require conversion of suitable habitat within the PCEs for California red-legged frog critical habitat resulting in a significant impact. MM Biology-1 requires the qualified biologist or biological monitor working under a qualified biologist to delineate any sensitive areas, including critical habitat, for avoidance prior to commencement of an activity. California red-legged frog habitat would not be converted even if some work were to occur in riparian corridors. The overall impact to California red-legged frog critical habitat would be less than significant with mitigation. Midpen adheres to existing

measures in the MOU with CDFW for programmatic permitting, as well as measures identified in the USFWS Section 10(a)(1)(A) Recovery Permit for California red-legged frog. As long as no federal actions or federal lands are associated with the Program (e.g., federal grants to perform work), no additional permitting for impacts to critical habitat would be required.

Marbled Murrelet. A small sliver of critical habitat for marbled murrelet is designated within Purisima Creek Redwoods OSP immediately along the western edge of Skyline Boulevard. The PCEs of marbled murrelet Critical Habitat are broadly defined as 1) individual trees with potential nesting platforms, and 2) forested areas within 0.5 mile of individual trees with potential nesting platforms (USFWS 2011). Large trees with potential nesting platforms would not be removed or altered within critical habitat under the Program and no impacts would occur to PCE 1. The Purisima Creek Redwoods OSP very likely contains PCE 2. Patches of old growth and habitat suitable for marbled murrelet, though not technically classified as Critical Habitat, occur in north and south central Purisima Creek Redwoods OSP; northwest, southwest, and southeast El Corte de Madera OSP; north and central La Honda Creek OSP; south Skyline Ridge OSP; and north Long Ridge OSP. These non-critical habitat patches have the potential to support breeding marbled murrelet. The old growth habitat areas can be expected to benefit from removal of non-native vegetation in VMAs, from FRA creation intended to enhance and promote the growth of late-seral forests, and from ladder fuels removal to reduce the risk of catastrophic wildland fire. The overall impact to critical habitat for marbled murrelet would be positive and less than significant.

Steelhead and Coho Salmon. Streams that have been designated as critical habitat for California central coast ESU steelhead and California central coast ESU coho salmon are present in many locations throughout Midpen lands. PCEs for salmonid critical habitat are broadly defined as 1) freshwater spawning sites, 2) freshwater rearing sites, 3) freshwater migration corridors free of obstructions, 4) estuarine marine areas, 5) nearshore marine areas, and 6) offshore marine areas (NOAA Fisheries 2005). No impacts to estuarine or marine areas (PCEs 4, 5, and 6) would occur. Midpen lands contain PCEs 1, 2, and 3. Program activities, particularly vegetation management treatments, may occur in the vicinity of many of the streams designated as critical habitat. No new structures or materials (e.g., cut vegetation) would be introduced into stream channels that could pose fish passage barriers under the Program. As such, no impacts to PCE 3 would occur. In instances where vegetation management must occur along stream banks, loss of riparian cover could lead to decreased shading and increases in water temperature that could render spawning (PCE 1) or rearing areas (PCE 2) unsuitable. Program activities, such as vegetation removal near streams could lead to erosion and sedimentation of streams, affecting water quality in critical habitat. These impacts would be potentially significant.

Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would minimize impacts on aquatic environments and species (1 through 10, 19, 32, 33, 34, 35, 36). Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and

accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. Effects could remain significant for Program activities such as prescribed burning or grazing activities and vegetation thinning activities in riparian habitat, which are not addressed by these practices. MM Geology-2 would reduce impacts to streams by requiring a buffer distance between prescribed and pile burns around streams as well as other erosion control measures. MM Geology-3 requires use of existing facilities (e.g., roads, trails, and wet lines) for fire lines where they occur, or implementation of other erosion control measures. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails. MM Biology-14 requires additional measures to ensure no direct or indirect effects on salmonid streams. Program activities would not otherwise occur directly in waterways that support steelhead and Coho salmon critical habitat. Treatments in riparian areas would be modified to the level of FRAs and would only be applied where the work would benefit and enhance the habitat. Impacts would be less than significant.

Green Sturgeon. Critical habitat for southern DPS green sturgeon is present in all tidal marshes and sloughs within Ravenswood OSP and in the reach of Stevens Creek immediately adjacent to Stevens Creek Shoreline Nature Study Area. PCEs for green sturgeon in estuarine areas are broadly defined as 1) food resources, 2) sufficient water flow, 3) adequate water quality, 4) migratory corridors, 5) diversity of depths, and 6) adequate sediment quality. Any Program activities that occur in the vicinity of green sturgeon critical habitat would be conducted in upland habitats. No vegetation management activities are specifically proposed, but it is feasible that some small infrastructure improvements may be implemented in critical habitat. Ground disturbance could result in erosion and sedimentation of the downstream tidal marsh and slough habitats resulting in significant impacts.

Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. Impacts on green sturgeon critical habitat would be less than significant.

Analysis of Plans

Special-Status Plants

Vegetation Management Plan

Construction and maintenance of VMAs would involve removal of vegetation using manual and mechanical methods such as mowing and cutting equipment. VMP activities are not anticipated to contribute to the spread of invasive animals that could trample or indirectly impact special-status plants. Mature trees may be limbed, but generally would not be removed. Mature eucalyptus and acacia and diseased and dying trees, where they pose a hazard, are the exception. Young or stunted small trees and shrubs may be removed. Prescribed burning could occur in grasslands and forest and woodland understory. Pile burning to eliminate slash would be conducted and vegetative debris may also be chipped or masticated. Herbicides would be

applied in discrete locations to target non-native species. These activities could occur in areas where special-status plant species have been observed or have a high probability of occurring.

Mechanical equipment has the potential to damage less resilient special-status plant species by crushing or cutting. Use of mechanical equipment could spread forest diseases, killing special-status plant species. Vehicles and equipment could spread invasive species, which may outcompete special-status plant species. Limbing and cutting of trees and plants has the potential to spread forest diseases. Herbicide overspray or drift could kill special-status plants. Some of the treatments proposed, such as disclines, could result in the permanent removal of special-status plant individuals in the area due to routine treatments.

Creation of new disclines and fuelbreaks may encourage the growth and spread of invasive species. Various factors contribute to whether invasive species would populate the area and to what degree, including the types of methods are used (e.g., bulldozer, handtools), level of vegetation removal, vegetation community type, and what invasive species are present. A study of shaded fuelbreaks generally[8] did not find non-native plant cover to be statistically different in the treated fuelbreak area compared to adjacent wildland (Merriam, Keeley, & Beyers, The Role of Fuel Breaks in the Invasion of Nonnative Plants, 2007). Fuelbreaks constructed by bulldozers resulted in significantly higher relative non-native cover than fuelbreaks constructed by hand or other mechanical equipment (e.g., rubber tired and tracked vehicles, skid steers), with mechanical equipment yielding the lowest non-native cover. Non-native plants were observed to be more abundant within fuelbreaks than in the surrounding landscape in California shrublands and chaparral (Merriam, Keeley, & Beyers, 2006). The burn area would be patrolled by Midpen EDRR crews. As part of the Program, Midpen would implement a monitoring and adaptive management approach to prescribed burning conducted under the Program. Although many fuel and vegetation treatments could positively benefit special-status plant species in the long-term due to habitat modification, short-term and long-term impacts could still occur, depending on the species and the habitat types.

Creation of various types of VMAs could also fragment habitat associated with a special-status plant species. Habitat fragmentation is the process of dividing large areas of habitat into multiple smaller, increasingly disconnected patches. Habitat fragmentation changes ecological processes and diminishes the landscape's ability to buffer events that cause extinction (Forman 1995). For example, a disease that kills a particular plant species is more likely to eliminate the entire population if the population is confined to a small area (habitat patch). Indirect impacts from Program activities from invasive species or forest diseases could occur. The impact on special-status plant species would be significant.

[8] One studied shaded fuelbreak had lower relative non-native cover within the fuelbreak than the adjacent wildland.

Table 4.4-5 Summary of Impacts on Special-Status Wildlife Species from Program Tools and Techniques

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
				Invertebrates and Fish			
Special-Status Freshwater and Brackish Water Invertebrates and Fish Species	Slow-moving or still freshwater aquatic habitats, coastal streams and stream tributaries to San Francisco Bay, salt marsh habitats at the lowermost reaches of coastal streams, and tidal sloughs connected to San Francisco Bay.	Mechanical and manual methods would be used around and upstream of creeks on Midpen lands where invertebrates or fish may occur. No work would occur within creeks and these species would not be directly impacted. Thinning of riparian habitat could alter water temperatures in streams, affecting fish and invertebrate species. Manual and mechanical methods have a small potential to cause sedimentation of streams or creeks used by these species. Fine sediments can reduce spawning and rearing habitat for fish species, which rely on riffles and gravel substrate. Invertebrate species could also be affected by an increase in sedimentation. Propane flaming would occur in small areas and would not result in large patches of bare soil that could erode into streams. Impacts on spawning habitat from use of heavy equipment, alteration of riparian habitat, and pile burning would be considered potentially significant. *Potentially Significant.*	Herbicides would not be directly sprayed into waterways or aquatic vegetation. Spot treatment and cut stump application would be employed; no broadcast spray would occur. Stormwater runoff could contain herbicides from adjacent spray areas or herbicide drift could lead to herbicides entering waterways. Studies have found that herbicides commonly used in forests are practically non-toxic or only slightly toxic to aquatic invertebrates and fish (Clark, Roloff, Tatum, & Irwin, 2009; Stehr, Linbo, Baldwin, Scholz, & Incardona, 2009). Herbicides may still cause direct toxicity to adults, larvae, and eggs of fish and invertebrates. Herbicide use could also kill non-target vegetation in aquatic habitats, which may eliminate plants necessary for cover, food, or substrate for egg attachment or affect phytoplankton and zooplankton communities. *Potentially Significant.*	Grazing would not occur across creeks that could support invertebrates or fish. Indirect impacts associated with erosion and sedimentation, as described for mechanical methods of removal, could occur. Sedimentation of waterways could be considered a potentially significant impact due to potential effects to fish spawning and rearing habitat and to invertebrates. *Potentially Significant.*	Prescribed burning would not directly impact fish and invertebrate habitat, but could indirectly result in erosion and sedimentation, similar to that described for mechanical methods. Spawning of fish and invertebrate species could be impacted. *Potentially Significant.*	Access on existing roads and trails would not impact special-status fish and invertebrate species. Creeks where these species could occur are perennial and generally would not be crossed by mechanical equipment, unless an appropriate permit is received for placement of fill into a jurisdictional water. Vegetation removal for rehabilitation of skid trails for access could have the same impacts from sedimentation as discussed for mechanical removal. Impacts on fish spawning and invertebrate habitat would be considered potentially significant. *Potentially Significant.*	Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would minimize impacts on aquatic environments and species (1 through 10, 19, 32, 33, 34, 35, 36). Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. The impact could remain significant. MM Geology-3 requires a buffer distance between prescribed and pile burns around streams as well as other erosion control measures. MM Geology-3 requires use of existing facilities (e.g., roads, trails, and wet lines) for fire lines where they occur, or implementation of other erosion control measures. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails. MM Biology-14 identifies additional protection measures for activities conducted near or in aquatic habitat to minimize impacts on salmonids. **Less than Significant with Mitigation.**
Special-Status Bees	Grassland, scrub, and sparse woodland habitats throughout Midpen lands.	The mobility of bees would allow most to escape any danger posed by heavy equipment and pile burns. The direct impacts on the species would be less than significant given the low sensitivity status and minimal chance	Studies have found that herbicides commonly used in forests were essentially no to low risk to bees (Clark, Roloff, Tatum, & Irwin, 2009). Given the limited area where herbicides would be used,	Livestock would not impact bees as individuals could move away and livestock pose no threat to individual bees. **No Impact.**	Prescribed burning would occur in habitats that could be used by bees, including grasslands and woodlands. A large-scale meta-analysis found that prescribed fire resulted in the same effect on	Access would be along existing roads and trails, but former logging skid roads could also be cleared in areas to access work sites. Access road clearance in grasslands and woodlands that	**Less than Significant.**

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		to harm a significant number of individuals, even if vegetation work or tree removal affected a hive. Removal of vegetation could diminish the supply of wildflowers in discrete locations, but for most activities (e.g., fuelbreak creation), wildflowers would regrow after a short period. Propane flaming would generally be conducted in discrete locations. Individual bees would not be harmed, and incidental loss of non-target species is unlikely. **Less than Significant.**	it is unlikely that bees would be directly exposed to herbicide spray. Herbicide use has been linked to reduced diversity of wildflowers that bees and other beneficial arthropods feed from (Egan, Bohnenblust, Goslee, Mortensen, & Tooker, 2014). Herbicide application would be by spot treatment or cut stump, not broadcast spray. Even when accounting for minimal amounts of overspray and drift from the proposed targeted applications, herbicide use under the Program is unlikely to significantly affect the availability of wildflowers due to the small area of treatment compared to the overall size of Midpen lands. **Less than Significant.**		species abundance and richness of bees as wildland fires, which led to increases in these species (Carbone et al 2019). While above-ground nests of special-status bumble bees, such as those in decaying logs, would likely be destroyed during prescribed burns (Schweitzer et al 2012), burned areas have been found to contain substantially increased numbers and diversity of native bees, including several *Bombus* species (Galbraith et al 2019). Pollinator conservation guidelines for prescribed burning include leaving a mosaic of burned and unburned areas, as necessary, to ensure that species can re-colonize from unaffected habitats nearby (Hopwood et al 2015, Xerces Society 2018). Bees are mobile and could move away from prescribed burns. The impacts on the species would be less than significant given the low sensitivity status and minimal chance to harm a significant number of individuals. **Less than Significant.**	supports bees could occur. If a bee were to occur, it could move away from the disturbance area with minimal effect. **Less than Significant.**	
Special-Status Butterflies and Moths (other than the Monarch Butterfly)	Serpentine grasslands, chaparral, oak woodlands, and dune habitats along Monterey Bay. Several species may only occur where their host plant is present.	Heavy equipment has the potential to crush the host plants for butterflies and moths or kill individual larvae or pupae. Pile burning may destroy host plants or larvae present in the immediate area. For example, host plants for Bay checkerspot butterfly are in serpentine habitats, where heavy equipment or pile burning use would typically not occur, but other host plants could be present throughout areas where these activities occur. Given the rarity of these species, the loss of individual larvae and stands of host plants would be considered a potentially significant impact. Propane flaming would generally be conducted in areas with	Butterfly and moth species are particularly susceptible to impacts from herbicides, as they rely entirely on host plant species for survival. Herbicide overspray or drift could result in the removal of host plants, and may kill individual eggs, larvae, and pupae that are attached, which would be a significant impact. *Potentially Significant.*	Grazing could occur in areas where host plants grow. Grazing is unlikely to permanently remove entire stands of host plants but could result in temporary reduction of host plants as well as crush individual larvae or pupae. *Potentially Significant.*	Prescribed burning would occur in habitats that could be used by butterflies and moths, including woodlands. A large-scale meta-analysis found that prescribed fire resulted in the same effect on species abundance and richness of butterflies and moths as wildland fires, which led to significant decreases in these species (Carbone et al 2019). Prescribed burning could impact these species directly and indirectly through the loss of host plants. Host plants for other species could occur in areas where prescribed burning would	Host species are not anticipated to occur on existing trails and roads. Travel and vehicle access clearing could traverse off-road areas where host species grow. Given the rarity of some of the butterfly and moth species, the loss of individual larvae and stands of host plant would be a potentially significant impact. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would prevent overspray and drift (IPMP BMPs 1 through 10). Impacts on special-status butterfly and moth species could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		small, leafy vegetation. Host species may be present in areas where flaming could occur. However, due to the relatively small area that flaming would impact and the focus on non-native species, the potential for loss of host plants is minimal. *Potentially Significant.*			be implemented. Some of the host plants appear to germinate from seed in response to fire but are not specifically benefitted. Individual butterfly and moth larvae or pupae could be killed during burning. *Potentially Significant.*		area, as appropriate, to designate host plants in the area. MM Biology-13 requires surveys for host plants in areas of suitable habitat prior to an activity and designation of a buffer around host plants containing eggs, larvae, or pupae, if present at the time of the activity, ensuring avoidance. **Less than Significant with Mitigation.**
Monarch butterfly - California overwintering population	Groves of trees on Midpen lands that are near the Pacific Coast, including eucalyptus.	Manual and mechanical methods would be used for vegetation removal and other Program activities. Eucalyptus trees, a species used for overwintering by monarchs, would be removed or thinned where the trees pose a fire hazard. Even thinning of trees or removal of substantial amounts of understory vegetation would very likely render occupied groves unsuitable by altering wind and temperature patterns. Monarch butterflies have not been previously documented overwintering on Midpen lands, though the western portions of Tunitas Creek OSP, Purisima Creek Redwoods OSP, and Miramontes Ridge OSP that are in the coastal zone may include suitable overwintering habitat in the form of wind-protected groves of trees. The majority of monarch overwintering sites in California are within 1.5 miles of the coast (Pelton et al. 2016), and the portions of these OSPs that are in the coastal zone are largely farther inland, suggesting that habitat is marginal at best and the potential for occupation is fairly low. The Xerces Society for Invertebrate Conservation identified 50 top priority overwintering sites for conservation of monarch butterflies in California, none of which are located on or near Midpen lands (Pelton et al 2016). Milkvetch, the monarch's host plant, would not be targeted for removal, but	Same as for other special-status butterflies. *Potentially Significant.*	Same as for other special-status butterflies. *Potentially Significant.*	Burning may be beneficial to the milkweed host plants, depending on the time of year the burn occurs (Baum & Sharber, 2012). Individual butterfly larvae or pupae could be killed during burning, similar to the other special-status butterflies. *Potentially Significant.*	Same as for other special-status butterflies. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would prevent overspray and drift (IPMP BMPs 1 through 10). Impacts on special-status monarchs could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area, as appropriate, to designate host plants in the area. MM Biology-13 requires surveys for host plants in areas of suitable habitat prior to any activity and designation of a buffer around host plants containing eggs, larvae, or pupae, if present at the time of the activity, ensuring avoidance. MM Biology-15 requires surveys and avoidance of monarch overwintering aggregations. If overwintering aggregations are located in eucalyptus removal areas, replacement of the grove with native trees such as Monterey pine or Monterey cypress are required over a long-

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		may be incidentally removed during vegetation removal, such as for fuelbreak creation or installation of a water tank. Loss of overwintering sites or host plants would significantly impact the monarch species. Adult monarchs are mobile and would be unlikely to be directly impacted by heavy equipment use. Individual butterfly larvae or pupae could be killed during pile burning or crushed by equipment if present on a host plant. Host species may be present in areas where flaming could occur. However, due to the relatively small area that flaming would impact and the focus on non-native species, the potential for loss of host plants is minimal. *Potentially Significant.*					term process to maintain habitat integrity. **Less than Significant with Mitigation.**
				Amphibians			
Special-Status Salamanders and Newts	Lowland grasslands, oak savannah, woodland and forest habitats. Often found in or near streams.	Operation of vehicles and heavy equipment, such as those used during defensible space maintenance or installation of firefighting infrastructure, could crush individual salamanders and newts. The direct impact on salamander individuals from use of vehicles and equipment could be significant if the species occurs in the area. Ground disturbance from use of these techniques could crush burrows used by salamanders or result in erosion. Impacts from sedimentation of habitat could affect breeding by sediment accumulation on the salamander and newt egg masses, resulting in loss. Pile burning has the potential to desiccate any salamanders that have taken refuge in a brush pile. As part of Midpen standards practices, the biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if individuals are unlikely to be present. Propane flaming would generally be conducted in discrete	Salamanders and other amphibians have been found to be sensitive to some types of herbicide use with effects ranging from stunted growth to death (King & Wagner, 2010; Shirk, 2010). Herbicides would not be directly sprayed into waterways or aquatic vegetation. Spot treatment and cut stump application would be employed; no broadcast spray would occur. Stormwater runoff could contain herbicides from adjacent spray areas or herbicide drift could lead to herbicides entering waterways. Herbicides could cause direct toxicity to adults, nymphs, and eggs of salamanders and newts. Herbicide could also kill non-target vegetation in aquatic habitats, which may eliminate plants necessary for cover, food, or substrate for egg attachment. *Potentially Significant.*	Grazing would not occur in areas where salamanders and newts are typically found, waterbodies or moist areas. Salamanders or occupied burrows in upland areas could be crushed by grazing. Overgrazing could result in erosion and sedimentation that could impact eggs and waterways supporting the salamander. *Potentially Significant.*	Prescribed burns have the potential to occur along areas with suitable habitat. Burning could desiccate salamanders traveling through upland habitat. Death of individual salamanders would be considered a potentially significant impact. *Potentially Significant.*	Travel and vehicle access on currently used roads and trails would have minimal likelihood of impacting salamanders, but the clearing of skid trails were they to cross over or near salamander and newt habitat, including forests and woodlands, could impact the species through crushing. Instream crossing could also impact these species. *Potentially Significant.*	Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would minimize impacts on aquatic environments and species (1 through 10, 19, 32, 33, 34, 35, 36). Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. IPMP BMP 21 requires implementation of a training program that would describe salamanders and newts and how to avoid harming these species. Impacts on these species could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		areas with small, leafy non-native sprouts. Direct risks to salamanders from ATV use or flaming would be minimal. Habitat is not anticipated to be permanently altered or lost as a result of Program activities. Work under the Program would generally improve and enhance habitat through weed removal and actions that improve forest and soil health. Impacts to riparian corridors would be minimal and work to thin or treat riparian vegetation would improve or enhance the habitat. *Potentially Significant.*					to conduct pre-activity surveys to flag the work area, as appropriate, to designate aquatic and sensitive habitats that salamanders and newts could occur. MM Geology-2 requires a buffer distance between prescribed and pile burns around streams and other erosion control measures. MM Geology-3 requires use of existing facilities (e.g., roads, trails, and wet lines) for fire lines where they occur, or implementation of other erosion control measures. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails. MM Biology-10 requires avoidance or minimization of damage to suitable habitat for salamanders and newts, relocation of individuals by a qualified biologist, and presence of a monitor in areas of suitable habitat. MM Biology-16 identifies specific measures to avoid harm to amphibians from burning including collection and relocation of individuals if found during the pre-burn survey. **Less than Significant with Mitigation.**
California red-legged frog	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation.	Same as for special-status salamanders and newts. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	Prescribed burns have the potential to occur along areas with suitable habitat. The use of prescribed fire as a means of reducing fuels, controlling non-native species, and reducing the likelihood of catastrophic wildland fires is consistent with the goals of the recovery plan for California red-legged frog (USFWS 2002). Burning could desiccate frogs traveling through upland habitat. Death of individual frogs would be considered a potentially significant impact. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	The same herbicide application, erosion control, and worker training requirements as described for special-status salamanders and newts would apply. Any measures in the MOU with CDFW for routine maintenance activities would also be implemented as well as measures identified in the USFWS Section 10(a)(1)(A) Recovery Permit for California red-legged frog. MM Biology-7 requires avoidance of frogs, as feasible, or relocation of individuals by a qualified, permitted biologist, and the

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
							presence of a monitor in areas where individuals have been observed. California red-legged frog habitat would not be converted even if some work were to occur in riparian corridors. Work would be minimal, would avoid the use of heavy equipment and would enhance habitat. **Less than Significant with Mitigation.**
Foothill yellow-legged frog	Rocky, cascading streams in woodland, chaparral, and coniferous forests. May occur primarily in the southern part of Midpen lands. Note that foothill yellow-legged frogs are believed to be extirpated on Midpen lands.	Same as for special-status salamanders and newts. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	Same as for special-status salamanders and newts. *Potentially Significant.*	The same herbicide application, erosion control, and worker training requirements as described for special-status salamanders and newts would apply. MM Biology-8 requires avoidance of frogs encountered during work or relocation of individuals by a qualified biologist and the presence of a monitor in areas where individuals have been observed. Additionally, MM Biology-8 requires specific measures to be implemented for activities conducted within riparian habitat or Waters of the State and/or U.S and 1 mile of a known foothill yellow-legged frog occurrence (within the last 20 years). These frogs are believed to be extirpated from Midpen lands and as such, no pre-activity surveys are needed. **Less than Significant with Mitigation.**
Reptiles							
Western pond turtle	Ponds and large streams.	Heavy equipment used for vegetation treatments or pile burning could occur in upland areas near ponds or streams that are used for egg laying. These activities could result in the loss of	Few studies have been done on the toxicity or risks of herbicides on turtles. Of the studies available, one study found that only extremely high doses of	Grazing generally would not occur in areas where western pond turtles may be found. If grazing was to occur where pond turtles could have eggs,	Prescribed burning could occur in upland areas near reservoirs that are used for egg laying. Although unlikely, if prescribed burning were to occur over a pond turtle	Travel and vehicle access on currently used roads and trails would have minimal likelihood of impacting western pond turtles, since turtles would not nest on	Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would minimize impacts on aquatic environments and species

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		western pond turtle eggs or harm to individuals. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Turtles would not nest along roads and trails or other high-use areas that could be flamed. Direct risks to turtles or eggs from ATV use or flaming would be minimal. *Potentially Significant.*	herbicides yielded effects on turtle embryos and another study found no differences in the sex ratio of turtle hatchlings (Clark, Roloff, Tatum, & Irwin, 2009). Herbicides would not be directly sprayed into waterways or aquatic vegetation. Spot treatment and cut stump application would be employed; no broadcast spray would occur. Stormwater runoff could contain herbicides from adjacent spray areas or herbicide drift could lead to herbicides entering waterways where turtles live. Herbicides may cause direct toxicity to adults and eggs. Herbicide could also kill or affect non-target aquatic plants and species that the turtle relies on for food. *Potentially Significant.*	impacts from trampling would be potentially significant. *Potentially Significant.*	or its nest, harming or killing the individual or its eggs, impacts would be potentially significant. *Potentially Significant.*	active roads or cleared areas. Risks to turtles crossing road would be the same as for the existing conditions, since roads are currently used. Impacts would be less than significant. The clearing of skid trails, were they to cross over or near western pond turtle habitat, could impact the species or their eggs and nests through crushing. Impacts would be potentially significant. *Potentially Significant.*	(1 through 10, 19, 32, 33, 34, 35, 36). IPMP BMP 21 requires implementation of a training program that would describe this species and how to avoid harm. Impacts on the western pond turtle could remain significant. MM Biology-1 requires a qualified biologist or biological monitor under a qualified biologist to conduct pre-activity surveys to flag the work area to designate turtle nests. MM Geology-2 requires a buffer distance between prescribed and pile burns around streams as well as other erosion control measures. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails, which would ensure that overgrazing and soil compaction that could result in crushing of burrows does not occur. MM Biology-9 requires avoidance of nests and turtle individuals or relocation of individuals, if needed. MM Biology-16 identifies specific measures to avoid harm to turtles from burning including collection and relocation of individuals, if found during the pre-burn survey. **Less than Significant with Mitigation.**
San Francisco garter snake	Stream, wetland, and pond habitats throughout the northern portion of Midpen lands. Occurs sympatrically with its primary prey, California red-legged frog.	Operation of vehicles and heavy equipment near aquatic features or grasslands could crush individual snakes. The direct impact on snake individuals from use of vehicles and equipment could be significant if the species occurs in the area. Ground disturbance from use of these techniques could crush burrows used by snakes during hibernation or for shelter. Piled slash could attract snakes seeking cover under vegetation. This species may be	Few studies have been done on the toxicity or risks of herbicides on snakes, but the studies available found that herbicides were not acutely toxic to two species of garter snake (neither of which were San Francisco garter snake) (Clark, Roloff, Tatum, & Irwin, 2009). Herbicides would not be directly sprayed into waterways or aquatic vegetation. Herbicide application would be by spot treatment or cut stump, not	Grazing would not occur in areas where snakes are typically found, wetlands and aquatic environments, but could occur in grasslands. Snakes or occupied burrows in grasslands could be crushed by grazing. *Potentially Significant.*	Although burning would not occur in aquatic and wetland environments, prescribed burning would be conducted in grassland habitats where snakes could occur. Studies have found that substantial direct mortality from fire is uncommon in snakes (Halstead, et al., 2011). One study found that prescribed fire may be a viable management tool for maintaining open habitats where San Francisco garter snakes	Travel and vehicle access on currently used roads and trails would have minimal potential to impact snakes, but the clearing of skid trails were they to cross over or near suitable habitat, including grasslands or near aquatic features, could impact the species through crushing. *Potentially Significant.*	The same herbicide application, erosion control, and worker training requirements as described for western pond turtle would apply. MM Biology-6 requires avoidance of snakes or relocation of individuals by a qualified biologist, adherence to the USFWS Recovery Permit in areas where individuals have been observed, and the presence of a monitor in suitable habitat during initial disturbance. Any measures in the

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		injured or killed during pile ignition. As part of standards practices, the biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if individuals are unlikely to be present. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Direct risks to snakes from ATV use or flaming would be minimal. Impacts from conversion of habitat are not anticipated as work would generally enhance habitat over the long-term. *Potentially Significant.*	broadcast spray. Overspray or drift could expose snakes or their prey to herbicides with currently unknown effects. *Potentially Significant.*		occur and prescribed fire can be a tool in habitat enhancement and species recovery (Halstead, et al., 2018). Individuals may be present during a burn but are anticipated to seek shelter in burrows. Soil temperatures generally do not exceed 140 degrees F below 3.5 centimeters and 100 degrees F below 7 centimeters during a low-intensity fire, such as a prescribed burn. As such, it is anticipated that individuals would survive a low-intensity prescribed burn. Based on the studies, it is unlikely that burning could adversely and significantly affect snakes and burning may be beneficial. **Less than Significant.**		MOU with CDFW for routine maintenance activities would also be implemented. MM Biology-16 identifies specific measures to avoid harm to snakes from burning including collection and relocation of individuals, if found during the pre-burn survey. **Less than Significant with Mitigation.**
Blainville's horned lizard	Scrub, grassland, and woodland habitats with sandy or gravelly substrates.	Vehicle and heavy equipment use in suitable habitat, such as woodlands and grasslands, could crush individual lizards, which would be significant. Piled slash could attract lizards seeking cover under vegetation resulting in injury or death during ignition. As part of standards practices, the biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if individuals are unlikely to be present. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Direct risks to lizards from ATV use or flaming would be minimal. *Potentially Significant.*	Few studies have been done on the toxicity or risks of herbicides on lizards. One study of a skink species found use of an herbicide altered the behavior of the species in a way that could increase predation and reduce survival (i.e., basking in warmer microclimates) (Carpenter, Monks, & Nelson, 2016). Herbicide application would be by spot treatment or cut stump, not broadcast spray. Were there to be minimal amounts of overspray or drift, it could expose lizards or their prey to herbicides with currently unknown effects. *Potentially Significant.*	Grazing could occur in suitable habitat for lizards. Livestock grazing would not directly impact lizard individuals on the surface, as individuals could move away from livestock. It is feasible that an individual hibernating in a burrow could be crushed. Death or injury of lizards would constitute an impact. *Potentially Significant.*	Prescribed burning could be conducted in suitable habitat, including grasslands and woodlands. A study of another special-status horned lizard species found that in burned pastureland home ranges, smaller and more prey was available, suggesting a positive effect on this species (Burrow, Kazmaier, Hellgren, & Donald C. Ruthven, 2002). This species typically escapes extreme weather by burrowing in loose soil and hibernating in burrows. It is anticipated that individuals would survive a low intensity, prescribed burn. Based on the studies, it is unlikely that burning could adversely and significantly affect snakes and may be beneficial. **Less than Significant.**	Travel and vehicle access on existing roads and trails would have minimal potential to impact lizards, but the clearing of skid trails where they to cross over or near suitable habitat, including grasslands or woodlands, could impact the species through crushing. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would prevent overspray and drift (IPMP BMPs 1 through 10). Impacts on special-status lizards could remain significant. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails, which would ensure that overgrazing and soil compaction that could result in crushing of burrows does not occur. MM Biology-16 identifies specific measures to avoid harm to lizards from burning including collection and relocation of individuals, if found during the pre-burn survey. **Less than Significant with Mitigation.**

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
			Birds				
Special-Status Bird Species and Nesting Birds (other than marbled murrelet)	Suitable nesting habitat present in tall trees and cliff faces, trees near open areas such as grasslands and marshes and salt marsh habitats on the San Francisco Bay shoreline.	Mowing within grassland, scrub, and woodland habitats, and tree trimming, limbing, and removal could result in the direct loss of an active nest. Nesting birds, including hawks, may use the eucalyptus and other non-native tree species present on Midpen lands. Noise from nearby equipment could disturb active nests, depending on the equipment used, anticipated amount of time for construction equipment to be at a given location, topography, vegetation community, sensitivity to disturbance of any nesting birds present, and other factors. The maintenance of existing treatment areas, including fuelbreaks and defensible space, do not occur in any one area for a prolonged period of time, which would minimize noise exposure at any one location. Avoiding mowing, non-native tree removal and tree trimming, and other equipment use within the nesting bird season (February 15 – August 30) would not be feasible because the primary time for many Program activities is spring and summer, prior to seed setting in the springtime. Ground nesting birds could nest in or near slash piles. Pile burning could expose nesting birds to smoke or result in mortality of eggs and young. Pile burning is typically conducted in the wet season, avoiding much of the nesting season. As part of standards practices, the biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if individuals are unlikely to be present. The loss or disturbance of an active nest of a special-status or otherwise protected bird species from mechanical equipment or burning would be considered a significant impact. Propane flaming would	Studies have found that forest herbicides (e.g., glyphosate, imazapyr) used according to label directions are nontoxic and do not bioaccumulate or bioconcentrate in birds (Clark, Roloff, Tatum, & Irwin, 2009). Spot treatment and cut stump application would be employed; no broadcast spray would occur. Due to the low risk that herbicides pose to birds and the discrete application of herbicides, the impact would not be significant, even in the event of accidental overspray or drift. **Less than Significant.**	Grazing activities would not result in excessive noise that could disrupt nesting or directly impact trees used by special-status avian species or nesting birds. Livestock could crush the nests or burrows of ground nesting birds, resulting in nest destruction or nesting failure. *Potentially Significant.*	Prescribed burning could impact nesting birds if burning occurs during the nesting season in areas where nesting birds are active. Smoke or fire could harm nesting birds nesting directly in the area of a burn. Some species may benefit from habitat alteration as a result of prescribed burns, particularly ground-dwelling birds. Evidence suggests that fire maintains habitat viability for burrowing owls by keeping grass low and preventing encroachment of trees and shrubs, and as such prescribed burns have been suggested as a management tool for this species (Burrowing Owl Working Group 2007). *Potentially Significant.*	Operation of vehicles and equipment on existing roads and trails would not be considered a new noise source and would only occur for a short time as a vehicle passes. Impacts on nesting birds would not occur. Clearing of skid trails would require similar vegetation removal and treatment as described for mechanical methods. Were a nest directly removed or damaged or if noise disturbs nesting birds resulting in nest failure, impacts would be potentially significant. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. IPMP BMP 22 requires nesting bird surveys and implementation of buffers around observed active nests. Midpen implements nesting bird training for workers conducting certain activities and sends out informational reminders to workers during the nesting season (Midpen, 2019b). Impacts on the nesting birds could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area to avoid nests. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails, which would ensure that overgrazing and soil compaction that could result in crushing of burrows does not occur. MM Biology-11 identifies specific survey radii and monitoring protocol for nests and nesting birds. MM Biology-16 identifies buffer distances needed to avoid harm to birds from burning. **Less than Significant with Mitigation.**

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		generally occur in discrete areas with small, leafy non-native sprouts. Use of ATVs during propane flaming would not be considered a significant noise source and would not occur in one location for long. *Potentially Significant.*					
Marbled murrelet	Nests in mature redwood forests.	Vehicle and equipment could be used in redwood forests and could involve removal of understory brush in a shaded fuelbreak, or limbing of trees. No mature, healthy redwood trees would be removed under this Program. Pile burns could be ignited in the vicinity of redwood trees. Direct effects on adults or chicks would not occur, but noise from equipment and smoke from burning could disturb nesting birds. A study of disturbance on nesting murrelet adults and chicks indicated that trail use did not appear to influence behavior and that adult and chick murrelets did not flush from a nest when exposed to chainsaw noise, but did exhibit behavioral responses. The study notes that the chainsaw disturbance could be indirectly detrimental, by interrupting feeding behaviors (Hébert & Golightly, 2006). Noise and smoke disturbance could disturb nesting murrelets resulting in nest failure. *Potentially Significant.*	Same as for special-status bird species. **Less than Significant.**	Grazing activities would not directly affect nesting murrelets and would not result in excessive noise that could disrupt nesting or directly impact trees used by this species. **Less than Significant.**	Prescribed burning could impact nesting murrelets if burning occurs during the nesting season in areas where nesting birds are active. The recovery plan for marbled murrelet cites wildland fire as a substantial threat to nesting habitat and specifies decreasing the risk of habitat loss due to fire as part of the species' recovery strategy (USFWS 1997). Smoke or fire could harm a nesting bird located directly in the area of a burn. *Potentially Significant.*	Operation of vehicles and equipment on existing roads and trails would not be considered a new noise source and would only occur for a short time as a vehicle passes. Clearing of skid trails could occur in or adjacent to redwood forests and would require similar vegetation removal and treatment as described for mechanical methods. Noise from equipment could disturb nesting birds, resulting in nest failure. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. IPMP BMP 22 requires nesting bird surveys and implementation of buffers around observed active nests. IPMP BMP 29 requires implementation of CDFW noise requirements if activities are conducted during the breeding season in areas where murrelets could nest. Impacts on the nesting birds could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area to avoid nests. MM Biology-11 requires avoidance of activities during the murrelet nesting season in suitable habitat or implementation of disturbance buffers to avoid noise impacts. **Less than Significant with Mitigation.**
				Mammals			
Ringtail	Riparian, woodland, and forested habitats.	Vehicles and heavy equipment use would not be expected to harm ringtail individuals. Due to the species' mobility, they can move away from disturbances, such as the presence of humans. Treatment of small areas with propane flaming would not harm ringtail due to the mobility of this species. This species dens in rock piles, hollow trees, and rock crevices.	Studies have found minimal or no sub-acute, chronic, or neurotoxic effects in mammals when ingesting forest herbicides representative of normal field applications. Additionally, forest herbicides were not found to bioaccumulate or persist in mammals (Burrow, Kazmaier, Hellgren, & Donald C. Ruthven,	Grazing would generally occur in shrubland or grasslands but could occur in forested habitats that are suitable for ringtail. Grazing would not directly impact ringtail and would not interfere with the behavior of ringtail, which are mostly nocturnal, or cause other indirect effects.	Prescribed burns would be low intensity. As such, direct harm to individuals would be unlikely as the ringtail would be able to move away from the flames or take refuge in trees. **Less than Significant.**	Travel and access along existing roads and trails would not increase threats to ringtail over existing conditions. Clearing of skid trails would not directly impact this species. **Less than Significant.**	**Less than Significant.**

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		Activities involving manual and mechanical methods would generally not disturb these types of environments. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Direct risks to ringtail from ATV use or flaming would be minimal. **Less than Significant.**	2002). Spot treatment and cut stump application would be employed. No broadcast spraying is permitted under the Program. Due to the low risk that herbicides pose to mammals and the discrete application of herbicides, the impact would not be significant, even in the event of accidental overspray or drift. **Less than Significant.**	**No Impact.**			
Mountain lion	May occur anywhere within Midpen lands.	Vehicles and heavy equipment use would not be expected to harm mountain lion individuals. Due to the species' mobility, they can move away from disturbances, such as the presence of humans. Treatment of small areas with propane flaming would not harm mountain lion due to the mobility of this species. This species den in rock piles, hollow trees, and thickets, specifically seeking difficult to access features away from human activity. Activities involving manual and mechanical methods would generally not disturb these types of environments. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Direct risks to kangaroo mountain lion from ATV use or flaming would be minimal. **Less than Significant.**	Same as for ringtail. **Less than Significant.**	Grazing would occur within suitable habitat for mountain lion. Although grazing would not directly harm mountain lions, livestock are prey and livestock owners may view mountain lions as a threat. Midpen operates a program to provide compensation for loss of livestock due to predation, which eliminates potential conflicts. **Less than Significant.**	Same as for ringtail. **Less than Significant.**	Travel and access along existing roads and trails would not increase threats to mountain lions over existing conditions. Clearing of skid trails would not directly impact this species. Mountain lions are likely deterred from these areas due to periodic human presence. **Less than Significant.**	**Less than Significant.**
Special-Status Bat Species	Riparian areas, woodland and forest habitats, and human-made structures throughout Midpen lands. May roost in buildings, bridges, tunnels, other human structures, caves, and trees.	Bat species that utilize caves, mines, tunnels, buildings, or bridges (e.g., Townsend big-eared bat) would not be impacted by manual vegetation removal. Loud, mechanical equipment used in defensible spaces could impact bat species using buildings or structures in the area. Tree removal activities, including eucalyptus and acacia, could impact colonial bat species, which select a variety of trees and roost features, including cavities, crevices and deep fissures in the wood or bark of a tree, and exfoliating bark.	A study has found that some herbicides (i.e., clopyralid and dalapon) accumulate in bat tissue although little is known of toxicity in bats (Second, Major, Patnode, & Sparks, 2015). Herbicide application would be by spot treatment or cut stump, not broadcast spray. Overspray or drift could expose bats to herbicides with currently unknown effects. *Potentially Significant.*	Grazing would not impact areas where bats could roost, such as large trees, caves, or buildings. Grazing would not result in removal of any trees. **No Impact.**	Prescribed burning could impact colonial and solitary roosting bats through the generation of smoke and heat from flames, if the burns were to occur in the immediate vicinity of an individual roost, maternity roost, or bat colony. *Potentially Significant.*	Operation of vehicles and equipment to perform vegetation management actions would not result in the removal of trees and would not impact special-status bat species. Impacts on roosting bats from the clearing of skid trails could be significant if a tree is removed that contains individual roosting bats, maternity roosts, or bat colonies. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would prevent overspray and drift (IPMP BMPs 1 through 10). Midpen requires implementation of BMPS for avoiding and minimizing impacts on the special-status bats

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		Colonial bats that could roost in trees on Midpen lands include pallid bat, long-eared myotis, Yuma myotis, and other myotis species. Solitary bats (i.e., hoary bat, and Townsend big-eared bat) roost individually, except when females are raising pups, generally in foliage. Depending on the species present, the size of the roost, the type of roost (e.g., maternity, day, night, hibernation), and the season when tree removal would occur, the removal of trees could result in a significant direct impact on bats through removal of the roost and injury to bats. Pile burns would be limited in size and extent. Temporary smoke would be limited in extent and most piles would burn in a matter of a few hours. Propane flaming would be used in small areas causing seedlings and annual plants to wither and die, which would not impact trees or roosting habitat. *Potentially Significant.*					designated as California species of special concern (e.g., Townsend's big-eared bat, pallid bat). The BMPs require bat surveys for maternity roots prior to activities in suitable habitat, avoidance of identified roosts, or implementation of a bat exclusion plan. For other bat species, including those listed as CDFW Special Animals and for species assumed to be extirpated (e.g., western mastiff bat), the Midpen qualified biologist has the discretion to determine which of the BMPs are appropriate, depending upon the circumstances. **Less than Significant.**
San Francisco dusky-footed woodrat	Ubiquitous in oak and riparian woodlands.	Heavy equipment and vegetation removal activities could occur in suitable habitat for the woodrat and around woodrat nests. Nests could be dismantled or damaged by use of equipment. Removal of vegetation in the immediate vicinity of nests may also change temperature or other microhabitat conditions leading to nest abandonment. Woodrat individuals and pups could be crushed or killed. Piled slash could attract woodrats seeking cover under vegetation resulting in injury or death during ignition. As part of standard practices, the biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if individuals are unlikely to be present. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Direct risks to woodrats	Ecological risk assessments have found that use of forest herbicides (e.g., glyphosate, imazapyr) used according to label directions are low risk on small mammals (e.g., woodrats) (Clark, Roloff, Tatum, & Irwin, 2009). Spot treatment and cut stump application would be employed. No broadcast spraying or burrow fumigants are permitted under the Program. Due to the low risk that herbicides pose to small mammals and the discrete application of herbicides, the impact would not be significant, even in the event of accidental overspray or drift. **Less than Significant.**	Grazing may occur in suitable oak woodland habitat. Livestock would be unlikely to disturb stick nests. Woodrat individuals would not be harmed as a result of grazing. **Less than Significant.**	Prescribed burns would not typically be conducted in riparian habitats but may be conducted in oak woodlands. Low-intensity prescribed burns have little short-term impact on woodrats, as long as patches of well-structured habitat are maintained during the process. Woodrats could benefit in the long-term if the risk of catastrophic wildland fire is reduced (Vreeland and Tietje 1998, Lee and Tietje 2005). Prescribed burning is likely detrimental to this species in the event nests of a colony are destroyed (CDFW, 1990). Burns would destroy stick nests and have the potential to kill or injure woodrat individuals and pups. *Potentially Significant.*	Travel and vehicle access on existing roads and trails would have minimal potential to impact woodrats, but the clearing of skid trails where they to cross over or near suitable woodland habitat could impact the species through crushing. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Midpen requires implementation of the San Francisco Dusky-Footed Woodrat Protocol that identifies measures for avoiding and minimizing impacts on woodrats. The measures require a survey conducted by a qualified biologist or biological monitor for stick nests prior to any activity in suitable habitat. If present, stick nests shall be avoided where feasible, or live trapping implemented. The impact on woodrats from prescribed burns could remain significant. MM Biology-16 identifies buffer distances between stick nests and a prescribed burn needed to avoid

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
		from ATV use or flaming would be minimal. *Potentially Significant.*					harm to woodrats from burning. If stick nests cannot be avoided, woodrat relocation would occur per the Woodrat Protection Protocol. **Less than Significant with Mitigation.**
Santa Cruz kangaroo rat	May occur in open chaparral habitats with friable soils.	Limited activities would occur in potentially suitable chaparral habitats where the kangaroo rat could occur. Burrows could be damaged or crushed by equipment or vehicles. Kangaroo rat individuals and pups could be crushed or killed. Piled slash could attract kangaroo rats seeking cover under vegetation resulting in injury or death during ignition. As part of standard practices, the biological monitor would inspect slash piles prior to ignition to determine whether the pile needs to be taken apart and put back together again, or if individuals are unlikely to be present. Propane flaming would generally be conducted in discrete areas with small, leafy non-native sprouts. Direct risks to kangaroo rats from ATV use or flaming would be minimal. *Potentially* Significant	Same as for San Francisco dusky-footed woodrat. **Less than Significant.**	Grazing may occur in suitable chaparral habitat. Livestock may collapse burrow entrances and lead to entrapment of wildlife within burrows or exclusion and exposure of those caught outside. *Potentially Significant.*	Prescribed burns may be conducted in chaparral. The chaparral habitat kangaroo rats have been historically observed in (i.e., sandhill chaparral), depend upon a fire regime. Fire suppression has negatively impacted the habitat of this species (Rhoades, 2017). It is unlikely that burning could adversely and significantly affect kangaroo rats and burning may be beneficial. **Less than Significant.**	Travel and vehicle access on existing roads and trails would have minimal potential to impact kangaroo rats, but the clearing of skid trails where they to cross over or near suitable chaparral habitat could impact the species through crushing. *Potentially Significant.*	IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Impacts on the kangaroo rat could remain significant. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock, which would ensure that overgrazing and soil compaction does not occur that could result in crushing of burrows. **Less than Significant with Mitigation.**
Salt-marsh wandering shrew Salt-marsh harvest mouse	Salt marsh habitat along the San Francisco Bay shoreline in Ravenswood OSP and Stevens Creek Shoreline Nature Study Area.	No activities requiring the use of vehicles and equipment would occur in salt marsh habitat. **No Impact.**	Same as for Santa Cruz kangaroo rat. **Less than Significant.**	Grazing would not be conducted in salt marsh habitat. **No Impact.**	Prescribed burns would not be conducted in salt marsh habitat. **No Impact.**	No activities requiring access with vehicles would occur in salt marsh habitat. **No Impact.**	**Less than Significant.**
American badger	Ranges widely and may occur in many areas throughout Midpen lands including open areas with friable soils within woodland,	Use of hand-held mechanical and manual vegetation removal techniques would not be expected to harm the species. Due to the species' mobility, they can move away from disturbances, such as the presence of humans, pile burning, and mechanical equipment. Typical badger dens are as deep as 3 meters below the ground	Same as for Santa Cruz kangaroo rat. **Less than Significant.**	Grazing could occur in suitable habitat for badgers. Livestock grazing would not directly impact the species as livestock are no threat to badgers. **Less than Significant.**	Prescribed burning has potential to harm individual badgers. Given their size, badgers would be expected to move away from prescribed burns. If a prescribed burn were to occur over a badger den it could result in injury or death to an individual badger or its young.	Travel and access along existing roads and trails would not increase threats to badgers over existing conditions. Clearing of skid trails would not directly impact badgers or badger dens. Badgers are likely deterred from these areas due to periodic human presence.	**Less than Significant.**

Species	Typical Habitat on Midpen Lands	Manual and Mechanical Techniques	Chemical Application	Prescribed Herbivory	Prescribed Burning	Access and Vehicle Travel	Mitigation and Conclusion
	grassland, and savannah habitats.	surface and are only used for a day to a week at a time, except when rearing young (spring). Female badgers typically will dig multiple interconnected burrows with multiple entrances. Heavy equipment used to remove trees or masticate slash could potentially crush the entrance to a badger den, but because of the depth dens typically are and because natal dens have multiple entrances, it is unlikely that a badger would be crushed. Treatment of small areas with propane flaming would not harm badgers due to the mobility of this species. **Less than Significant.**			**Less than Significant.**	**Less than Significant.**	

When a large habitat patch is split into two smaller patches, the edges of each patch are subject to changes in light, wind, moisture, and other variables that affect habitat quality for some types of plants. Although there are exceptions, most special-status plant species are negatively impacted by edge effects, in part because habitat edges are more susceptible to invasion by exotic species (Harper et al. 2005, Merriam et al. 2006). The "edge" between two habitats can act as a barrier to some species, thus impeding (or impairing) movement of pollinators or animals that disperse plant propagules. Special-status plants within 200 feet of an activity may be subject to impacts associated with edge effects (CBI 2000). However, activities under the Program would not result in dramatic alteration of habitat. Disclines are typically in areas of highest fire threat, such as under or near existing transmission lines. These areas are typically already disturbed. Most shaded fuelbreaks or non-shaded fuelbreaks are located near roads or other infrastructure with existing disturbance. Edge effects are not anticipated to be a major concern from implementation of the VMP.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status plant species could still remain significant. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails that could damage or kill special-status plants. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and identify special-status plants in the area. MM Biology-2 (which incorporates IPMP BMP 25) requires pre-activity surveys for plants and either avoidance or a stepwise approach to mitigating impacts that may require compensatory mitigation under MM Biology-3, depending on the species. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. Impacts associated with most of the proposed treatments on special-status plant species would be reduced to less than significant with mitigation. Depending upon the location, impacts associated with disclines, fuelbreaks, and installation of firefighting infrastructure would be significant and unavoidable.

Prescribed Fire Plan

Prescribed burning would be conducted in areas where special-status plant species are known or have the potential to occur. Pre-treatment activities would involve the use of vehicles and equipment to create or maintain control lines. Individual plants could be crushed or killed by heavy equipment. Equipment and workers could contribute to the spread of invasive species and forest diseases. Prescribed burning has varying effects on special-status plant species depending on the species, intensity, duration, and timing. Some species or their seedbanks could be killed by burning. Prescribed burns are not anticipated to contribute to the spread of invasive animals that could trample or indirectly impact special-status plants. Prescribed fire can be a tool to reduce non-native plant species but can promote the spread of invasive species (Keeley, Franklin, & D'Antonio, 2011; Rice & Smith, 2008). Control lines could also increase the

abundance of invasive plant species in the line as well as adjacent areas. One study found a 16-fold increase in spotted knapweed (*Centaurea biebersteinii*) density on dozer lines between postfire years 1 and 3 in ponderosa pine forests in western Montana. Adjacent burned plots were free of spotted knapweed the first year after fire but had been invaded by knapweed by the third year after fire; propagules within the dozer lines were the apparent source. Over many decades, non-native species may increase in dominance both within fuelbreaks (control lines) and in adjacent areas (Zouhar, Smith, Sutherland, & Brooks, 2008). Studies have suggested a pattern that fuelbreaks (or control lines) may act as seed sources for burned sites compared to fuelbreaks in areas where there has not been a fire. Seed availability is important for post-fire colonization and high intensity fires in particular destroy seed banks (Merriam, Keeley, & Beyers, 2006). Prescribed fires are generally low intensity and are not anticipated to cause this particular issue. Following a burn, control lines would be rehabilitated. The burn area would be patrolled by Midpen EDRR crews. As part of the Program, Midpen would implement a monitoring and adaptive management approach to prescribed burning conducted under the Program, but invasive species could remain a concern. The impact from prescribed burning on special-status plant species could be significant.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status plant species could still remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and identify special-status plants in the area. MM Biology-2 requires pre-activity surveys for plants and either avoidance or a stepwise approach to mitigating impacts that may require compensatory mitigation under MM Biology-3, depending on the species. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. The impacts on special-status plant species from prescribed burning and pre-treatment activities would be less than significant with mitigation.

Wildland Fire Pre-Plan

Installation and construction of firefighting infrastructure would involve use of vehicles and equipment for ground-disturbing activities that could damage or kill special-status plant individuals or populations.

IPMP BMP 21 requires implementation of a training program that would describe special-status species, including plants, and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status plant species could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and identify special-status plants in the area. MM Biology-2 (which incorporates IPMP BMP 25) requires pre-activity surveys for plants and either avoidance or a stepwise approach to mitigating impacts that may require compensatory

mitigation under MM Biology-3, depending on the species. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. The impacts on special-status plant species from installation of firefighting infrastructure would be less than significant with mitigation.

Special-Status Wildlife

Vegetation Management Plan

Creation and maintenance of VMAs would occur in areas where special-status wildlife species have been observed or could occur due to presence of suitable habitat. VMP activities are not anticipated to contribute to the spread of invasive animals. If present in a work area, small special-status species, such as California red-legged frog, could be crushed by heavy equipment and ground disturbance associated with VMP activities. Vegetation removal and thinning also has the potential to directly harm nests or individual special-status bird species. Tree removal and thinning could directly impact special-status bats. Noise from equipment and smoke from pile burning could disturb breeding special-status bats and other nesting special-status bird species.

Small-scale habitat alteration would occur as part of the creation and maintenance of VMAs, including decreased vegetation height in grasslands, reduced shrub density in scrublands, and increased openness and removal of understory in forest and woodland habitats. Such impacts would occur to only a small fraction of any given habitat type in an area. Only a comparatively small amount of Midpen lands would be impacted by vegetation management in any given year, leaving the vast majority of habitat in the overall landscape unaffected and available for use by wildlife species. The mosaic of areas that have been subject to vegetation management and areas that have not may have a beneficial effect by creating habitat heterogeneity. Specialized wildlife habitats and habitat features, such as host plant patches, trees and snags containing bat roosts, aquatic features such as streams and ponds, and woodrat nests, would be avoided whenever possible during vegetation management but could be removed or altered significantly, impacting species relying on these features. Vegetation removal and burning could lead to areas more prone to erosion. Sedimentation of aquatic environments and streams could affect aquatic species such as coho salmon and special-status salamanders. Removal and thinning of eucalyptus trees on Midpen lands has the potential to impact monarch butterflies if their overwintering aggregations are present by eliminating or altering the habitat. The direct and indirect impacts on special-status wildlife from implementation of the VMP would be potentially significant.

Herbicide application would be conducted according to Midpen's IPMP BMPs and regulations, which would minimize impacts on special-status wildlife species (1 through 10, 19, 32, 33, 34, 35, 36). Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. IPMP

BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status plant species could still remain significant. MM Geology-2 reduces impacts on streams by requiring a buffer distance between pile burns around streams as well as other erosion control measures. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area, as appropriate, and identify special-status species in the area. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MMs Biology-6 through 15 would further reduce impacts by requiring specific species-protection avoidance and minimization measures, and, for certain species, compensatory mitigation requirements for habitat conversion. The long-term overall impact to wildlife habitat is expected to be positive, as the aim is to promote the health and resiliency of natural vegetation types and remove non-native vegetation. Furthermore, the anticipated reduction of wildland fire risk minimizes the potential for high-intensity fires to fully eliminate stands of shrubland, forest, or woodland, or cause other detrimental effects to special-status wildlife habitats. These measures will reduce this impact to a less-than-significant level.

Prescribed Fire Plan

Prescribed burns could occur in habitat suitable for various special-status wildlife species including grasslands and oak woodlands. Prescribed fire would not occur in tidal marsh habitats, and therefore no impacts to tidal marsh and estuarine wildlife species would occur. Prescribed burns would be conducted in relatively small, discrete areas of the overall landscape, with abundant areas of adjacent habitat left unaffected. Prescribed fire has varied effects on wildlife, depending on the species. It has complex effects on pollinator populations, including the special-status butterflies, moths, and bumble bees. Loss of host plants and direct loss of individual butterfly and bee larvae and pupae could occur. Prescribed burns could kill special-status amphibians or aquatic turtles and eggs in upland areas. Noise generated by equipment and vehicles used during creation and maintenance of control lines and other burn preparation activities and smoke from the burn could disturb special-status nesting birds and roosting bats. Low-intensity prescribed burns may have widely varying effects on different species and habitats that may occur within burn footprints. However, nearly all wildlife species are likely to benefit from the overall reduction in risk of catastrophic, high-intensity wildland fire. Prescribed burning is not anticipated to affect or contribute to the spread of invasive animals. The direct and indirect impacts on special-status wildlife species would be potentially significant.

Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and accidental spills

of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status plant species could still remain significant. MM Geology-2 requires a buffer distance between prescribed burns around streams as well as other erosion control measures. MM Geology-3 reduces impacts by requiring use of existing facilities (e.g., roads, trails, and wet lines) for fire lines where they occur or implementation other erosion control measures. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and to identify special-status species in the area. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MMs Biology-6 through 16 would further reduce impacts by requiring specific species-protection avoidance and minimization measures, and, for certain species, compensatory mitigation requirements for habitat conversion. With the implementation of mitigation measures, impacts would be less than significant.

Wildland Fire Pre-Plan

Installation or construction of firefighting infrastructure would involve use of vehicles and equipment. Heavy equipment and vehicles could crush and kill small special-status amphibians, reptiles, and mammals. Small animals could fall into trenches for water pipelines resulting in mortality. Any newly created access roads would be short spur roads and would not be heavily travelled by vehicles. As such, this type of infrastructure would be unlikely to contribute to overall habitat fragmentation. New staging and landing areas could fragment sensitive and rare habitats. The creation, improvement, and use of firefighting infrastructure could directly or indirectly impact special-status wildlife through mortality of individuals or through habitat loss, fragmentation, or degradation. Impacts on special-status species could be significant.

Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion, accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas. IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on special-status wildlife species could still remain significant. MM Geology-2 reduces impacts on streams by requiring a buffer distance between pile burns around streams as well as other erosion control measures. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and identify special-status species in the area. MM Biology-4 requires Midpen to implement

techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MMs Biology-6 through 15 would further reduce impacts by requiring specific species-protection avoidance and minimization measures, and, for certain species, compensatory mitigation requirements for habitat conversion. With the implementation of mitigation measures, the impact would be less than significant.

Impact Biological Resources-2: Substantial adverse effect on riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS, or State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.	**Significance Determination**
	Less than significant with mitigation

Overview

The Program includes vegetation treatments to accomplish two interrelated objectives: (1) reduce the potential for large or severe fires, which can have catastrophic consequences on ecological and humans' environments; and (2) maintain biodiversity, improve ecological health, and increase ecosystem resiliency to fire, invasive species, and climate change. The emphasis of this analysis is on potentially significant negative impacts; there is less emphasis on the potentially significant positive impacts of the Program, in part because the focus of CEQA is on identification of impacts that require mitigation. Unlike most negative impacts, positive impacts are difficult to quantify, may take many years to materialize, and in some instances are largely theoretical. For many of the communities, there is no way of knowing the full magnitude of the impacts not implementing the Program until those consequences (e.g., native species enhancement, conversion of the community) unfold. For example, although it is relatively certain that Midpen lands would be subject to wildland fires in the future, there is no way of knowing when or specifically where those wildland fires would occur, and how much further degraded ecosystem conditions would (or might) be at that time. The potential for severe fires, which often have unmitigable impacts on not only human lives but ecosystems as well, would be greater without implementation of the Program. The Program is expected and assumed to result in a positive and beneficial impact on the environment for this reason.

The types of direct and indirect impacts of the Program on sensitive plant communities would depend upon a host of biotic and abiotic factors, including the: (a) activity size, methods, timing, and intensity; (b) type, frequency, and timing of subsequent treatments, where needed; (c) site characteristics (e.g., soils, topography, climate, and land use history); (d) landscape variables associated with the existing plant community (e.g., patch size and configuration); and (e) characteristics of the plants in the community (e.g., species presence, abundance, distribution, phenology, and health). Although impacts on sensitive communities would depend on numerous factors, the following generalizations can be made, which are subsequently analyzed in depth:

1. Program activities would have no negative impacts on barren/rock communities.
2. VMP and PFP activities may degrade (or enhance) sensitive grassland, wetland, riparian, and aquatic communities. However, these activities would generally not

eliminate those communities. Over the long-term, VMP and PFP activities are expected to benefit sensitive grassland, wetland, riparian, and aquatic communities.

3. VMP and PFP activities within other sensitive communities (e.g., scrub, chaparral, and forest) may alter the structure of those communities. In some instances, the structure could be altered substantially. From an ecological perspective, this impact may be positive, negative, or neutral. For example, creation of a shaded fuelbreak in an overstocked forest is likely to have a positive ecological impact. Conversely, maintenance of a discline through a scrub community could prevent maturation of plants, which could negatively impact the ecological functions of the community (e.g., as wildlife habitat). Impacts are tempered by the typical discline location near disturbed areas and their narrow width (approximately 10 feet).
4. Many of the VMAs would be subject to recurring treatments. Some types of recurring treatments, such as creation and maintenance of shaded fuelbreaks, could result in "type conversion," of sensitive communities, specifically chaparral and coastal scrub communities, whereby the sensitive community is converted into another vegetation type, which would be a potentially significant impact.
5. Most of the drainages, wetlands, and other aquatic features in the Program area are subject to regulations under the Porter-Cologne Water Quality Control Act and sections 401 and 404 of the federal Clean Water Act. In addition, some of the features are subject to regulations under the California Coastal Act and section 1602 of California Fish and Game Code. Any impacts to these features would be significant.
6. All of the Program activities have the potential to affect the composition, distribution, and abundance of non-native plants, some of which may be invasive.

Analysis of Tools and Techniques

Manual and Mechanical Techniques – Hand Tools and Equipment

Overview of Direct Impacts

Manual and mechanical techniques would involve use of powered and non-powered hand tools, tractors, chippers, mowers, and other heavy equipment. The specific techniques that would be used in a given area would depend on the Program objectives, terrain, and ecological sensitivity of the work area. For example, mechanical techniques would be used to remove vegetation on relatively gentle slopes, whereas manual techniques would be used on steep slopes or other ecologically sensitive areas requiring a high level of precision. Hand-held tools would be used to perform fine-scale tasks typically following initial use of mechanical equipment.

The impacts from mechanical techniques would be largely similar to those from manual techniques, with a few exceptions. First, because mechanical techniques are less precise than manual ones, these techniques are more likely to result in damage to non-target species or vegetation communities. Second, transporting mechanical equipment to treatment sites may

cause ground disturbance that damages vegetation in sensitive communities, as analyzed under *Access and Vehicle Travel* in Section 4.4.6: Impact Analysis, Impact Biological Resources-1. Third, mechanical equipment is more likely to loosen, compact, or expose soils. In most instances, these effects would be relatively modest, and therefore, the potential for significant impacts on the associated vegetation community would be low. For example, several studies have reported that mechanical techniques: (a) do not have a significant effect on soil bulk density (a measure of soil compaction), and (b) have minimal effects on soil exposure, except in limited areas of intensive equipment activity such as skid trails (Moehring et al. 1966, Boerner et al. 2009, Stephens et al. 2012). Mechanical techniques that involve discing are an exception because this activity causes substantial alterations of surface soil. This work can alter successional processes due to the loss of soil nutrients, microflora, and seed banks. Such alterations can lead to the persistence of early seral species (Prose et al. 1987), reduction of native species cover and richness (Hironaka and Tisdale 1963, Lathrop 1983, Waaland and Allen 1987), and alteration of the functions provided by the plant community.

The impacts that manual and mechanical techniques have on sensitive communities would depend on the objectives for the activity, specifically whether impacts are intentional or unintentional. Intentional impacts on sensitive communities would occur when the management objective is to remove or substantially modify vegetation that comprises the sensitive community. Unintentional impacts to sensitive communities could occur if equipment operators incidentally trample sensitive communities, cut or crush (or otherwise damage) plants in sensitive communities (e.g., during tree felling), or if debris piles smother plants in sensitive communities. These direct impacts on sensitive vegetation communities would be potentially significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and identify areas of sensitive communities. MM Biology-17 requires pre-activity surveys for sensitive communities and either avoidance or a stepwise approach to mitigating impacts that may require compensatory mitigation under MM Biology-18. Mitigation would reduce the direct impacts to less than significant.

Overview of Indirect Impacts

Microclimate, Dust, and Wildland Fire. Manual and mechanical techniques have the potential to affect sensitive communities by adding or removing organic material from the ground surface, which may affect germination of some species. Manual and mechanical techniques may affect sensitive communities by removing plants from the overstory, thereby increasing light to the understory. The sensitive communities that are known to occur in the Program area tolerate or benefit from sun exposure. However, some of the sensitive communities that could occur on Midpen lands (e.g., Coastal Brambles, Hazelnut Scrub, and Ocean Spray Brush communities) could be negatively affected by any Program activities that cause dramatic changes in sun exposure. Recurring treatments that exceed historical disturbance regimes (especially in chaparral and coastal scrub communities) may cause type conversion or fundamentally alter the composition of the community. Vehicles and equipment could inadvertently start a fire. Ground disturbing activities and operation of vehicles could cause fugitive dust, which can affect the

health of plants and result in changes to a vegetation community's structure and functions. These indirect impacts to sensitive communities are potentially significant. Midpen implements strict practices for operation of equipment and ensures that staff and contractors are trained in fire prevention and suppression techniques in the event operation of equipment ignites a fire (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; LU Regulations Section 404.2). Midpen requires vehicles to travel no more than 15 mph on unpaved, unposted roads (LU Regulations Section 500.1; MO Manual 07.005), which would minimize dust. Impacts may remain significant due to changes in microclimate. MM Biology-17 requires a qualified biologist to conduct pre-activity surveys to determine whether any sensitive communities are present and whether avoidance or other measures are needed to prevent changes in microclimate that could be detrimental. Treatments are not anticipated to recur such that they would exceed historical disturbance regimes (especially in chaparral and coastal scrub communities) and therefore, should not cause type conversion or fundamentally alter the composition of the community. The impact from changes in microclimate, fugitive dust, and wildland fire ignition would be less than significant with mitigation.

Invasive Plants. The Program includes actions designed to remove (or control) invasive plants. These actions, in conjunction with Midpen's IPMP, are expected to result in an overall net reduction in the distribution and abundance of invasive plants in the Program area. Some Program activities have the potential to promote the colonization and spread of invasive plants. Invasive plant establishment occurs when the species is brought to an area via a vector (either anthropogenic or natural), suitable conditions are present for colonization, and the area is a suitable environment for invasive plant reproduction and spread. Tools, equipment, vehicles, livestock, clothing, and boots are potential vectors for the spread of invasive plants. Roads and trails are key vectors for invasive species introductions into natural areas. Most introduced species do not survive extended periods in new habitats because the species do not possess the evolutionary adaptations to adjust to the challenges posed by their new environment. Some introduced species, however, possess a competitive advantage over native species in an area. These species can reproduce and spread exponentially, especially if the ecosystem lacks a mechanism for keeping them in check (CDFA and CALIWAC 2005).

Program activities that could spread or contribute to the spread of invasive species include the installation of disclines and fuelbreaks, which would create suitable conditions for the establishment of invasive plants. Program personnel, equipment, and vehicles could transport invasive plant propagules to these VMAs. If the invasive plant becomes established, recurring disturbance (i.e., to maintain the VMA) could maintain the environmental conditions the invasive plant needs to survive, reproduce, and spread. Invasive plants threaten native diversity, alter ecosystem processes (Vitousek 1990, Ehrenfeld 2003, Theoharides and Dukes 2007), and can cause extinction of native species (Gurevitch and Padilla 2004). Next to habitat loss, invasive species pose the greatest threat to the nation's biodiversity and natural resources (U.S. Department of the Interior 2013). Any invasive species that colonizes Midpen land due to the Program would be a potentially significant impact to sensitive communities. Similarly, a potentially significant impact would occur if Program activities increase the distribution or

abundance of invasive species that already exist on Midpen land. Midpen implements invasive species BMPs to minimize spread and proliferation (IPMP BMPs 12 through 18). Impacts on sensitive communities from spread of invasive species could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive plant species. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. These impacts would be reduced to less than significant levels through implementation of mitigation.

Sudden Oak Death. SOD is present on at least half of Midpen's preserves. Midpen has been actively working on minimizing the spread of SOD for over 15 years. Decades of fire suppression has increased susceptibility of oaks to lethal infection of *P. ramorum*, which is extremely limited in areas that have burned in the last 50 years (Moritz and Odion 2005). As a result, prescribed burns conducted under the Program would not contribute to the spread of SOD. Removal and trimming of vegetation conducted under the Program would not contribute to the spread of SOD because cut vegetative material would remain on-site. However, personnel and equipment used to conduct Program activities could spread the disease if infected material is inadvertently transported (e.g., via vehicles or boots) from infected areas to uninfected areas. This impact would be potentially significant. Midpen employees follow field practices to limit the spread of SOD on OSPs by thoroughly cleaning all equipment and preventing the relocation of potentially contaminated vegetation and soils (IPMP BMP 11). The impact could remain significant due to work conducted in long linear features (e.g., fuelbreaks), which could move SOD from one location to another. MM Biology-4 requires implementation of several SOD and soil Phytopthoras management measures including scheduling activities to be conducted in areas of low SOD incidence prior to moving into infested areas as well as avoidance of piling slash and vegetation in standing water. The impact would be reduced to less than significant with implementation of mitigation.

Impacts by Sensitive Vegetation Community Type

Grassland Communities. The impacts that manual or mechanical techniques have on sensitive grassland communities would depend on the specific technique that is used, the seasonal timing of implementation, and whether the technique: (a) removes native species and seed banks, or (b) changes the competitive balance between native and non-native plants.

Kephart (2001) examined plant species richness and percent cover in response to manual treatments (gasoline-powered weed eaters) targeting yellow star thistle (*Centaurea solstitialis*) on 3 acres of grassland at Russian Ridge OSP (San Mateo County) in 1997 and 1998. The treatments effectively reduced cover of yellow star thistle, had no effect on cover of native species, were somewhat effective in reducing cover of exotics, and had no effect on the number of native or exotic species. Whereas the scope of Kephart's evaluation was limited, it provides evidence that manual treatments can be implemented in sensitive grassland communities without causing significant impacts on native species cover and richness. Most grasslands that would subject to mechanical techniques would be mowed. Because the soil seed bank of exotic annuals is generally short-lived, repeated well-timed mowing can increase cover of native perennial grasses, especially if applied in conjunction with other treatments (e.g., herbicides, prescribed

herbivory, prescribed fire) (Benefield et al. 1999, Young and Claassen 2008). Collectively, the research to date indicates mowing has a neutral or beneficial effect on native grassland communities in California (Benefield et al. 1999, Kephart 2001, Maron and Jefferies 2001, Seabloom et al. 2003). Mowing is not expected to have negative impacts on sensitive grassland communities. In addition to mowing, the Program includes creation and maintenance of disclines in select locations. Disclines are a type of vegetation treatment to turn over the soil and leave mostly a dirt surface. Disclines are typically 10 feet wide. Installation of a new staging area or other larger firefighting infrastructure would also involve vegetation removal. Disclines and other Program activities that fully remove vegetation are unlikely to be installed in sensitive grassland communities. If they were installed in these areas; however, they could result in loss of the community or portions of the community. This loss could be considered a significant impact, depending on the extent of loss and rarity of the community. Program activities could also introduce or spread invasive species in sensitive grasslands. These impacts would be potentially significant.

Midpen implements invasive species BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive grassland communities from spread of invasive species and direct loss could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 includes provisions for a qualified biologist to review and assess each project for impacts to sensitive natural communities and to identify spatial buffers or other management actions to reduce potentially significant impacts on the sensitive community, primary through avoidance. If measure to avoid or minimize impacts are not feasible, MM Biology-18 requires compensatory mitigation to reduce impacts to sensitive natural communities. Implementation of mitigation would reduce this impact to less than significant.

Chaparral and Coastal Scrub Communities. Native chaparral and coastal scrub communities are relatively resilient to manual and mechanical treatments when the treatments mimic historical disturbance events (Denslow 1985). However, these communities may be pushed beyond their threshold of resilience if subjected to treatments that exceed the historical disturbance regime frequency, or if the treatments preclude resprouting from root crowns, significantly deplete or remove the seed bank, and dramatically alter soil structure (Stylinski and Allen 1999). For example, recurring mastication of chaparral has the potential to cause the chaparral community to be replaced by grassland (Keeley 2002b). Thus, the impact that manual and mechanical treatments have on chaparral and coastal scrub communities would depend on the frequency, extent, and nature of the treatments. The response would depend on the taxa in the community and their life-history strategies. Specifically, some species (e.g., chamise) are able to resprout after they are cut, whereas others are not (e.g., big berry manzanita). If a species is unable to resprout, regeneration of that species would depend on seeds. Persistence of these "seeder" species depends on: (1) the ability to produce seeds in the interval between treatments, (2) the extent to which treatments deplete or remove the seed bank, and (3) the degree to which

manual and mechanical treatments alter site conditions necessary for recruitment of new individuals (Pausas et al. 2004). For example, maintaining a fuelbreak in chaparral and coastal scrub communities would require manual and mechanical treatments every 3 to 10 years, which exceeds the historical disturbance regime. As a result, some Program activities may cause type conversion of sensitive chaparral and coastal scrub communities, resulting in a significant impact (Keeley 2006).

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of invasive species, forest diseases, and direct loss could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 and MM Biology-18 requires review of project areas for special status communities and implementation of measures to avoid, minimize, or otherwise compensate for losses, including evaluating frequency of treatments in chaparral to minimize the likelihood of type conversation. Implementation of mitigation would reduce the impact to less than significant.

Forest Communities. Manual and mechanical treatments conducted under the Program would not permanently impact any sensitive forest communities. The treatments may affect the structure of those communities. Manual and mechanical treatments may open the canopy, which decreases competition among overstory trees and provides increased light to the understory. Understory vegetation often responds to light. A general pattern observed following treatments is an increase in understory production and diversity similar to that seen following low- to moderate-intensity fire (Stephens et al. 2012). Shrubs tend to recover rapidly following the initial decreases associated with treatment (Schwilk et al. 2009). Tree seedling recruitment appears to be a function of the amount of bare mineral soil that is exposed by the treatment and whether the soil is covered with residual organic material (e.g., slash, wood chips) (Schwilk et al. 2009). Tree regeneration may be a function of year-to-year variability in seed production among tree species, sprouting vigor, and weather factors (Schwilk et al. 2009). Mechanical treatments have not been shown to produce significant negative impacts on plant communities in forests that historically experienced low- to moderate-intensity fire regimes (Stephens et al. 2012). The Program would be implemented to improve forest health and resiliency and is not anticipated to result in a significant adverse effect to forest communities through management actions. Use of mechanical equipment and manual methods has the potential to spread SOD and forest disease that could have a significant impact on sensitive forest communities.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of forest diseases could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 includes additional avoidance and minimization measures to ensure

that Program activities minimize impacts to sensitive communities. Implementation of mitigation would reduce these impacts to less than significant levels.

Oak Savanna Communities. Manual and mechanical techniques would be implemented in oak savanna communities under the Program. Oak savanna communities have a relatively low tree density. Therefore, creation of shaded fuelbreaks in oak savanna communities would require minimal tree removal and would not fundamentally alter those communities. Spread of invasive species or forest diseases could have a significant impact on these communities.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of invasive species, forest diseases, and direct loss could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 includes additional avoidance and minimization measures to ensure that Program activities minimize impacts to sensitive communities. Implementation of mitigation would reduce these impacts to less than significant levels.

Riparian Communities. Direct effects on riparian communities would depend on the treatment type and objective. Per the Program, mechanical equipment would not be used within riparian communities. Only hand methods would be utilized. Riparian plant species have an array of morphological, physiological, and reproductive adaptations for survival in frequently disturbed environments (Dwire et al. 2010). As a result, it is unlikely that implementation of manual treatments would permanently impact riparian communities if the objective is to reduce the fuel load (i.e., to create FRAs and remove invasive species). Relative to surrounding uplands, riparian areas often have more diverse vegetation and greater physical heterogeneity, and they may have higher rates of plant species turnover through time, especially in herbaceous and shrub layers (Dwire et al. 2016). The work within riparian areas would be limited to FRA-level management, tailored to the habitat conditions of the riparian area, and would be performed by hand. The work would be performed to benefit riparian habitat and impacts to riparian communities would be less than significant. Work would be tailored to ensure that habitat alteration is minimized or avoided, including minimizing changes to shade over the waterway.

Soils in riparian areas are known to be vulnerable to both compaction and physical disturbance due to their high moisture content. Disturbance of organic and mineral soil layers during treatments can alter soil structure, infiltration, and bulk density and may lead to channelized runoff and erosion (Brown 1983, Binkley and Brown 1993). Removal of woody riparian vegetation with beneficial rooting characteristics can result in erosion of alluvial streambanks. Removal of herbaceous vegetation can decrease retention and accumulation of sediment, possibly influencing floodplain soil development if too much is removed (Thorne 1990). As part of the Program, a qualified biologist would assess the riparian community prior to treatment and determine the appropriate level of treatment that would be beneficial to the community. As previously mentioned, only hand tools would be used to ensure that soil effects would not

occur. Effects associated with spread of SOD or invasive species could still occur resulting in a significant impact.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of invasive species, forest diseases, and direct loss could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 includes additional avoidance and minimization measures to ensure that Program activities minimize impacts to sensitive communities, including riparian communities. Implementation of mitigation would reduce these impacts to less than significant levels. Midpen currently holds a Routine Maintenance Agreement under the California Fish and Game Code Section 1602, Lake or Streambed Alteration Agreement, which is valid through 2024. Midpen is revisiting this permit to expand the definitions of "routine" and to clearly address activities under the IPMP and WFRP. Any work within riparian corridors and that would impact riparian communities would fall under this permit. The implementation of the terms of the permit would further ensure that impacts to riparian communities are less than significant.

Wetland and Other Aquatic Communities. Manual and mechanical methods conducted in wetlands and other aquatic communities have the potential to eliminate those communities or substantially degrade their functions. Use of equipment and vehicles near wetlands and other aquatic communities could also indirectly impact those communities. These indirect impacts may be positive or negative depending on site conditions and the nature of the treatment. For example, because wetlands are highly susceptible to non-native species invasion, mowing grass near a wetland might help minimize encroachment of non-native species. Conversely, installation of a fuelbreak on the slope above a wetland could facilitate non-native species invasion and alter the flux of water and nutrients, which could negatively affect the wetland plant community. Direct and indirect impacts could be significant. Buffers between treatment areas and aquatic resources are known to minimize (or prevent) negative indirect impacts. The effectiveness of a buffer is dependent on its size. Based on their review of the literature, Castelle et al. (1994) reported that a buffer of at least 15 meters (49 feet) was needed to protect wetland and stream functions under most conditions. However, a range of buffer widths from 3 to 200 meters was found to be effective, depending on site-specific conditions. Thus, the authors recommended evaluation of four criteria to determine the appropriate buffer size: (1) resource functional value, (2) intensity of adjacent land use, (3) buffer characteristics, and (4) specific buffer functions required.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of invasive species, forest diseases, and direct loss could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17, MM Biology-18, and

MM Biology-19 would be implemented and require Midpen to evaluate work areas for wetlands and potential impacts to wetlands and to install buffers based on the four criteria. Implementation of mitigation would reduce significant impacts on wetlands and other aquatic communities to less than significant levels.

Manual and Mechanical Techniques – Pile Burning

Extreme temperatures that penetrate soil beneath burn piles can kill microbes, plant roots, and seeds. These effects, in conjunction with elevated nutrient levels and exposed soil surfaces, can promote non-native plant establishment in burn pile scars. Historically, organic mulches and other amendments have been used to try to rehabilitate soils, speed native plant recovery, and limit non-native plant establishment after pile burning. However, researchers who have investigated the effects of pile burning have concluded that burn scar rehabilitation is not ecologically necessary for small piles (<5 meters in diameter). Herbaceous plant cover and soil nitrogen availability recovered rapidly without rehabilitation treatments on small burn pile scars (3.5 meters mean diameter) in Colorado conifer forests (Rhoades et al. 2015). By the third growing season after burning, native forb and graminoid cover were comparable in untreated burn scars and unburned exterior areas. The researchers concluded that rehabilitation may not be required for small burn pile scars except in sensitive areas, such as those with water quality and invasive plant concerns. Halpern et al. (2014) examined vegetation responses to pile burning (2 to 4 meters in diameter) following tree removal from conifer-invaded grasslands in the Oregon Cascades. Although scar centers had a simpler community structure (fewer but more abundant species) than the adjacent vegetation, they remained free of exotics and recovered quickly, aided by the soil-disturbing activities of gophers and the regenerative traits of native, disturbance-adapted species. The researchers concluded that pile burning can be a viable and efficient approach to biomass reduction in the absence of exotics.

Pile burning conducted under the Program would not have any direct impacts on sensitive communities because it would be limited to small piles (1.5 to 3 meters diameter) placed in openings away from any live vegetation that might be damaged by the burn. However, pile burning could have a significant indirect impact on sensitive communities if invasive plants colonize the burn scars and subsequently spread into the surrounding communities.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of invasive species could remain significant. MM Biology-1 requires a qualified biologist or biological monitor working under a qualified biologist to conduct pre-activity surveys to flag the work area and identify sensitive communities in the area. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species with a California Invasive Plan Council high rating or designated as noxious that colonize the burn scar. Implementation of mitigation would ensure potentially significant impacts associated with pile burning are reduced to less than significant levels.

Manual and Mechanical Techniques – Flaming
Propane flaming may be used during vegetation management area creation to address broom and other invasive non-native species seedlings. Specially designed small, hand-held propane torches are used in small areas to kill dense and newly emerged green seedlings. Flaming is usually conducted during light rains or on wet days when forest litter or grassland thatch is not likely to catch fire and additional precautions are implemented at the time of use. Because flaming is a highly precise technique that targets non-native species, it would not have any negative impacts on sensitive communities. The impact would be less than significant.

Chemical Application
The Program includes limited use of herbicides to: (a) control invasive plants and SOD, and (b) create and maintain defensible space and other VMAs. Kephart (2001) examined plant species richness and percent cover in response to herbicide treatments at Russian Ridge OSP (San Mateo County). Herbicide treatments dramatically reduced cover of yellow star thistle (*Centaurea solstitialis*) and had minimal effect on native species (cover and richness). Herbicide drift could occur, causing herbicide particles or vapors to drift away from the target plant. These particles or vapors may impact non-target plant species, including species that comprise a sensitive community, or impact water quality if herbicides are applied in close proximity to aquatic environments. Herbicide applications conducted under the Program would adhere to Midpen's IPMP BMPs and regulations, which would minimize impacts on from herbicide drift on sensitive communities and aquatic environments (1 through 10, 19, 32, 33, 34, 35, 36). Impacts on sensitive communities, wetlands, and other waters would be less than significant.

Prescribed Herbivory
Prescribed herbivory may be conducted by sheep, goats, or cattle as pre-treatment before use of other techniques for fuel load reduction. Larger-scale grazing in grasslands (conservation grazing) is covered under Midpen's existing grazing management plans and is not a part of this Program. Prescribed herbivory under this Program would be limited to temporary use of livestock to address specific areas to reduce biomass and fuels, such as sloped hillsides that are more difficult to treat with mechanical equipment.

Grazing can affect plant communities through: (a) consumption of plant material and litter; (b) trampling; (c) deposition of nitrogen-rich urine and dung; (d) transport of plant propagules; and (e) hoof movement and wallowing (which break up soil surfaces, incorporate seed into the soil, and compact soil). These effects can change the competitive balance among plants, benefiting some plant species over others. The corresponding effects to a sensitive community may be beneficial, negative, or neutral depending on the management objectives, time frame, and ecosystem variables measured.

Grazing may occur in native grasslands habitats in a limited capacity as pre-treatment. Limited and carefully timed grazing can be used to help restore a non-native grassland to a native grassland (Menke, 1992), but may not be beneficial for an undisturbed native grassland. The impact from poorly managed grazing on native grasslands would be potentially significant.

Areas with serpentine soils have higher proportions of native species and are prohibitive to growth of non-native grassland species due to the unique growing conditions (Huenneke, Hamburg, Koide, Mooney, & Vitousek, 1990). It is unlikely grazing would occur in serpentine chaparral habitat, but should invasive species spread to this habitat, grazing could occur. Grazing has been found to increase the richness[9] of native species on serpentine grasslands compared to grazing on non-serpentine grasslands (Harrison, Inouye, & Safford, 2003). This finding is dependent upon the intensity of grazing. Low to moderate grazing intensities are optimal for native species growing on serpentine soils (Safford & Mallek, 2011). Poorly managed grazing has the potential to significantly affect serpentine chaparral habitat. MM Geology-1 requires limitation of the number of animals and time spent using the stocking rate equation and surveys of grazing land to identify potential damage. The impacts on sensitive serpentine habitats would be reduced to less than significant with implementation of mitigation.

Grazing generally would not occur in sensitive woodland communities, as it is not effective for the type of vegetation removal required in this habitat (removal of tanoak and trimming of understory shrubs). Should grazing occur within sensitive upland forest and woodland communities, trees would not be damaged, and the focus would be on the removal of weedy understory plants. Impacts on forest and woodland communities from grazing would be less than significant

Grazing could impact riparian and wetland habitat if livestock trample or graze in these habitats. Cattle grazing in areas with vernal pools has been found to increase diversity of plant species and aquatic invertebrates and decrease abundance of non-native species (Marty, 2005). Ungrazed wetlands have higher levels of nitrate pollution than grazed wetlands, as cattle reduce the amount of accumulated dead plant matter (Allen-Diaz, Jackson, Bartolome, Tate, & Oates, 2004) (Jackson, Allen-Diaz, Oates, & Tate, 2006). Poorly managed and heavy grazing, however, negatively affects biodiversity (Marty, 2005). The impacts on wetland and riparian habitats from heavy or poorly managed grazing would be potentially significant.

MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails that could damage sensitive communities through overgrazing or excessive trampling. MM Biology-17 also requires careful management of grazing should it occur in or near a sensitive natural community. Implementation of these measures would mitigate grazing impacts on sensitive natural communities to less than significant.

Prescribed Burning

Overview

The effects of prescribed burning on sensitive communities would depend on multiple, interacting factors such as the fire regime, which includes the fuel types consumed, frequency

[9] Richness refers to the number of different species represented.

and timing of burning, intensity of the fire, and the spatial distribution of individual fire events, land use history, climatic patterns, and whether the burn is implemented in conjunction with other vegetation management techniques (e.g., mechanical treatments or grazing). In addition, the effects would depend on the specific vegetation community and its structure. For example, young seral stage stands are more likely to be fully scorched by a fire, and they are more likely to have exotic species and seed banks than more mature stands. Thus, fires that consume young seral stage stands are more likely to cause type conversion due to invasion of exotic species, especially if there are short intervals between fires (either prescribed burns or wildland fires).

Plant phenology and the susceptibility of meristems (regions of active cell division in plants) to fire are important determinants of interspecific variation in fire tolerance among species. In the peak of the growth season, grasses and many forbs have shifted their resources above ground where they are vulnerable to fire. Because there is variation in the phenology of individual species even within a life form group (e.g., native perennial grasses), the timing of fire may damage one set of species and thereby elevate the other to dominance. Species with buds and meristems located within plant tissues or by the soil surface are more likely to survive an intense fire than those with exposed or vulnerable meristems.

The effects that fires have on trees and shrubs depends on the traits of the taxa and whether the fire fully scorches the plant. For example, trees in western forest and savanna ecosystems have adapted traits (e.g., thick bark, tall height, self-pruning) that make them resilient to surface fires that scorch only a portion of the tree (e.g., the trunk and perhaps a few limbs). Post-fire persistence of tree and shrub communities that are fully scorched by fire depends on the ability to resprout and the ability to retain a persistent seed bank (Pausas et al. 2004). If a species is unable to resprout after fire, regeneration of that species would depend on a range of associated traits dealing with seed banks. In general, and at a local scale, persistence of these "seeder" species depends on: (1) the ability to produce seeds during the inter-fire period, (2) seed survival during the fire, and (3) the degree to which recruitment of new individuals is enhanced by the fire. Some species only regenerate shortly after fire (and not during the inter-fire period). For example, some trees (e.g., knobcone pine) have serotinous cones, which are strongly dependent on fire for the release of seeds.

Fire can promote invasion by exotic species because many exotics are responsive to disturbance and benefit from the competition-free, nutrient-rich environments that often result from fire (Alba et al. 2015). The potential for prescribed burns to promote the colonization or spread of exotic species is dependent on the specific vegetation community and the distribution and abundance of exotic propagules. For example, most exotic species do not tolerate closed-canopy conditions and cannot withstand crown fires in shrublands. Therefore, the extent of exotic invasion in burned shrublands depends on the rate of propagation of the exotic species and the speed at which the shrublands return to their former closed-canopy condition. As a result, exotic species are generally not a long-term issue in shrublands unless frequent burning (or other disturbance event) prevents canopy closure. The effects of prescribed fire on each of the sensitive natural communities that occur in the Program area are described here.

Grassland Communities

Wildland fire is a common natural disturbance in native grasslands and most grassland species are tolerant of fires that occur within the natural regime (in terms of frequency and season). Fire generally has a positive, although small, effect on abundance of native vegetation in grasslands (D'Antonio et al. 2002). Some of Midpen's grasslands contain a native grass component, including purple needlegrass (*Stipa pulchra*) and California oatgrass (*Danthonia californica*). D'Antonio et al. (2002) conducted a meta-analysis of 19 studies that examined the effects of fire on native grassland species, including those found on Midpen lands. The effects of fire on California grasslands are not straightforward increases in native vegetation or a consistent decrease in exotic cover, though elements of the native vegetation can benefit in some contexts. Whether fire benefits native grassland vegetation depends on the burn frequency and the presence of livestock. Native forbs benefit most from annual burning but not a combination of annual burning and grazing. However, grazing sustains the positive effects of a single burn on native forbs into the third year. Climate, particularly total precipitation, is generally more important than the type of burning treatment in influencing the response of native perennial grasses and forbs to fire. The initial results suggest that the long-term effect of fire on the abundance of native grasses is small (D'Antonio et al. 2002).

Soil temperatures during grass fires are not hot enough to eliminate exotic propagules (Keeley et al. 2011). Consequently, the benefit of fire to native vegetation does not correspond with proportional decreases in exotic vegetation cover, especially as the time since the last fire increases. Rather, fire generally causes proportional increases in both native and exotic components, rather than an unequivocal release of natives after fire (D'Antonio et al. 2002). Prescribed burns have been successful in reducing the abundance of specific invasive species such as yellow starthistle (DiTomaso et al. 1999), but only when the burns are sustained over time (Keeley et al. 2011). Grazing may dampen the increase in exotic vegetation that otherwise occurs with fire (D'Antonio et al. 2002).

The timing of fire in relation to plant phenology can affect the response of grassland communities. Seeds are more vulnerable to fire prior to dispersal because they are unprotected by soil and seed moisture content is higher (i.e., moister seeds are more susceptible to death by heating). Prescribed burning can effectively suppress these species if applied before mature plants disperse their seed in the spring (Pollack and Kan 1998). Conversely, burning after native seed dispersal and before germination may increase the abundance of exotic species that have increased establishment on bare ground, such as many forb species. If prescribed burns increase the abundance or spread of non-native species, this could indirectly impact sensitive grassland communities. The burn area would be patrolled by Midpen EDRR crews post-burn. As part of the Program, Midpen would implement a monitoring and adaptive management approach to prescribed burning conducted under the Program. The impact on grasslands from invasive species could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species caused by prescribed burns. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified

biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities. Prescribed burning would not have significant negative impacts on Midpen's sensitive grassland communities with implementation of mitigation.

Chaparral and Coastal Scrub Communities

Chaparral and coastal scrub communities are well adapted to fire, including high-intensity burns (Keeley et al. 2008). The primary threat in these ecosystems is frequent fire that contributes to reduced fire severity and increased alien plant invasion (Keeley et al. 2008). Stands of coastal scrub and chaparral with intact canopies are relatively resistant to invasion by non-native plants (Keeley 2002b). If the shrub stands burn but fire-return intervals remain within the range of 20 to 50 years (35 to 200 years for chaparral (Sommers, Coloff, & Conard, 2011)), non-native species may establish in the burned area, but their dominance typically declines as shrub cover re-establishes. Most non-native species that invade burned areas are herbaceous and shade-intolerant, so as the canopy closes these species are typically shaded out (Klinger et al. 2006). When fire occurs at more frequent intervals of 1 to 15 years, the dominance of shrubs, especially those regenerating from seed, declines rapidly (Haidinger and Keeley 1993). Non-native annual grasses and forbs from surrounding grasslands establish in the first years after burning, but more importantly can regenerate, persist, and dominate cover in a fire regime characterized by short fire-return intervals (Parsons and Stohlgren 1989). Once dense stands of annual grasses and forbs form, it becomes extremely difficult for woody and herbaceous native species to establish and regenerate (Schultz et al. 1955, Eliason and Allen 1997; Gordon and Rice 2000). The result is type conversion from a shrub community to a grassland community. The prescribed burns conducted under the Program would not be conducted at interval that would threaten type conversion of sensitive shrub communities. Similar to burns in grassland communities, the burn area would be patrolled by Midpen EDRR crews post-burn and Midpen would implement a monitoring and adaptive management approach to prescribed burning. The impact could remain significant as specific measures to address invasive plant spread caused by burning are not a part of Midpen's existing EDRR program. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species caused by burning, such as evaluation of the potential to spread invasive species prior to the burn and including this factor when determining the priority areas for burning. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities. With mitigation, prescribed burning would not have significant negative impacts on Midpen's sensitive shrub communities.

Forest Communities

Relatively frequent understory fires were historically common in western forest and woodland ecosystems (Brown and Smith 2000). Suppression of fires has shifted the composition of these forests because it has allowed colonization (or persistence) of shade-tolerant shrubs and

hardwoods in the understory and a higher density of trees in the overstory. In addition to increasing fuel loads to levels that support higher intensity wildland fires, shrubs and hardwoods in the understory provide a "ladder" for fire to reach the forest canopy. Wildland fires in forests that have been subject to decades of fire suppression can be high-intensity, stand-replacing events that cause catastrophic ecological impacts (e.g., landslides and other soil damage, type conversion, habitat loss).

Invasive plant species have rarely been identified as a major threat in mixed evergreen and conifer forests (Brown and Smith 2000). Klinger et al. (2006) found a negative relationship between richness and cover of non-native species and time since a burn, suggesting that even though non-native plants can establish in burned forests, they are shaded out as the canopy closes (Keeley et al. 2003). Nevertheless, non-native species have the potential to colonize forests after prescribed burns. Results of experiments on the interaction between cheatgrass (*Bromus tectorum*) and fire show that burning stimulates cheatgrass populations (Keeley et al. 2011). Other invasive species of potential concern in forests are predominantly woody species, such as Scotch broom (*Cytissus scoparius*), French broom (*Genista monspessulana*), tree-of-heaven (*Ailanthus altissima*), and eucalyptus (*Eucalyptus* spp.). These species are found most frequently along roads and highways and seldom in intact forests. Populations and individuals along roads could act as a propagule source and the roads as dispersal corridors in the event of disturbances, such as fire. Similar to burns in grassland communities, the burn area would be patrolled by Midpen EDRR crews and Midpen would implement a monitoring and adaptive management approach to prescribed burning. The impact on forest communities from invasive species caused by burning could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species caused by burning, such as evaluation of the potential to spread invasive species prior to the burn. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities. Mitigation would minimize establishment of invasive species following the burn, reducing the impact on sensitive forest communities to less than significant.

Oak Savanna Communities

The oak savanna communities on Midpen lands are well adapted to fire (Sawyer et al. 2009). Mature trees are usually resistant to moderate-severity fire because of their thick bark. Although they may not survive high-severity crown fires, they vigorously re-sprout (Bartolome et al. 2002, Sawyer et al. 2009). Whereas seedlings and saplings are top-killed by fire, juveniles sprout from root crowns. Several years may be required for trees to recover to pre-burn densities. Thus, short fire intervals (less than approximately 10 years, depending on the structure of the community) can hamper regeneration of oak savanna communities following fire. Prescribed burns conducted under the Program would not be conducted at intervals of less than 10 years in oak savanna communities. As part of the Program, Midpen would implement a

monitoring and adaptive management approach to prescribed burning, which would prevent prescribed fire intervals that might have long-term negative effects on oak savannas.

The disturbance caused by fire can facilitate invasion and dominance by non-native species. In shrublands and forests, canopy openings caused by fire are a temporary phenomenon. As these canopy openings close, they eliminate habitat for light-loving exotics. Oak savanna communities have a relatively open canopy, which allows persistence of non-native species in the understory. Although oak savanna communities in California already have non-native species in the understory, fire can remove duff and other surface materials, which inhibits additional alien species from becoming established. Similar to burns in grassland communities, the burn area would be patrolled by Midpen EDRR crews and Midpen would implement a monitoring and adaptive management approach to prescribed burning. Prescribed burning could have significant negative impacts on Midpen's oak savanna communities as Midpen's existing EDRR program does not currently address prescribed burns. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species caused by burning, such as evaluation of the potential to spread invasive species prior to the burn. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species with a California Invasive Plant Council high rating or designated as noxious that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities. Impacts associated with the colonization and spread of invasive species would be reduced to less than significant levels through implementation of mitigation.

Riparian Communities

Riparian communities are relatively resilient to fires (Pettit and Naiman 2007). As a result, prescribed fires that burn at low- to moderate-intensity cause minimal mortality of mature trees in riparian communities (Beche et al. 2005). Whereas prescribed fires can affect the presence and abundance of understory plant species, riparian plants recover quickly after fire (Pettit and Naiman 2007). Due to concerns over the effects of fire on ecologically sensitive habitats, there have been few experimental studies on the effects of prescribed burns on riparian communities. No experimental studies have been conducted on riparian communities on Midpen lands. Beche et al. (2005) examined multiple abiotic and biotic parameters to determine the effects of low- to moderate-intensity burns on a riparian zone in the Sierra Nevada. The burns did not result in a long-term change in riparian community composition. Prescribed fires that would be conducted for the Program would be low- to moderate-intensity. As a result, it is unlikely that they would have any significant impacts on riparian communities. To the contrary, protecting riparian communities from a wildland fire is likely to change the structure and possibly the function of those communities (Agee 1998) because fire exclusion can eventually lead to extreme, high-severity wildland fires that can have significant ecological consequences on both the riparian community and associated aquatic environment (Pettit and Naiman 2007).

Several investigators have suggested that fire may facilitate invasion into riparian plant communities. There is limited understanding of fire and invasive species interactions in riparian

communities, especially in the Southwest Coastal bioregion (Brown and Smith 2000). However, Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*R. laciniatus*), St. Johnswort (*Hypericum perforatum*), Canada thistle (*Cirsium arvense),* bull thistle (*C. vulgare*), common sheep sorrel (*Rumex acetosella*), perennial ryegrass (*Lolium perenne*), Scotch broom (*Cytisus scoparius*), white sweetclover (*Melilotus alba*), and common dandelion (*Taraxacum officinale*) have all been observed to establish or increase abundance after fires in riparian forests of the Northwest Coastal bioregion (Brown and Smith 2000). Similar to burns in grassland communities, the burn area would be patrolled by Midpen EDRR crews and Midpen would implement a monitoring and adaptive management approach to prescribed burning. The impact on riparian communities from invasive species caused by burning could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species caused by burning, such as evaluation of the potential to spread invasive species prior to the burn. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species with a California Invasive Plan Council high rating or designated as noxious that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities. Impacts associated with the colonization and spread of invasive species would be reduced to less than significant levels through implementation of mitigation.

Wetland Communities

Minimal information is available regarding how fire affects wetland communities in the Southwest Coastal bioregion, within which Midpen lands are located (Zouhar et al. 2008, Brown and Smith 2000). The primary threat appears to be invasion by non-native species, although wetlands in this bioregion are highly susceptible to invasion regardless of whether they are burned (Zouhar et al. 2008). Marty (2015) assessed the effects of fire on plant community composition in the heavily invaded uplands (grasslands) and less invaded vernal pools at four sites in the Central Valley. Fire decreased exotic grass cover but increased exotic forb cover leading to no net change in exotic species cover within the grasslands. However, fire led to a significant increase in native species cover and richness in the pool, edge, and upland zones. Although these beneficial effects only lasted for 1 year, the author concluded that even a single burn can be an important restoration tool because it helps replenish natives in the soil seedbank. Similar to burns in grassland communities, each burn area would be patrolled by Midpen EDRR crews and Midpen would implement a monitoring and adaptive management approach to prescribed burning. Prescribed burning could have significant negative impacts on Midpen's wetland communities as Midpen's existing EDRR program does not currently address prescribed burns. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species caused by burning, such as evaluation of the potential to spread invasive species prior to the burn. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species with a California Invasive Plant Council high rating or designated as noxious that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities.

Implementation of mitigation would ensure prescribed burns conducted under the Program do not promote the colonization and spread of invasive plant species and impacts would be less than significant with implementation of mitigation.

Access and Vehicle Travel

Vehicle travel associated with the Program would generally occur on existing roads and trails. However, vehicles could crush vegetation in sensitive communities if driven off-road. Personnel could trample low-lying vegetation (e.g., seedlings and forbs) when walking to work sites. These impacts would be limited in extent and are unlikely to significantly impact persistence of a sensitive community.

Midpen may need to create skid trails if a work site is not accessible from maintained trails and roads. Vegetation (e.g., trees) may need to be cut to enable mechanical equipment access, and mechanical equipment may crush vegetation along skid trails. In some locations, it may not be possible to design skid trails that completely avoid sensitive communities. The degree of impacts on a sensitive community associated with clearing and using skid trails would depend on the how long and frequently the access is used. In most instances, the vegetation community would recover after the skid trail is closed and rehabilitated. However, skid trails that are repeatedly used over time may prevent maturation of plants. In addition, skid trails that require repeated cutting (or crushing) of chaparral and coastal scrub may ultimately cause type conversion and fragmentation of the vegetation community. Clearing of skid trails could spread or introduce invasive species and forest diseases. The impact on sensitive communities could be significant.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive communities from spread of invasive species, forest diseases, and direct loss could remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 and MM Biology-18 include provisions for a qualified biologist or biological monitor working under a qualified biologist to review and assess each project for impacts to sensitive natural communities and to identify spatial buffers or other management actions to reduce potentially significant impacts on the sensitive community, primary through avoidance. If measures to avoid or minimize impacts are not feasible, MM Biology-18 requires compensatory mitigation. Implementation of mitigation would ensure incidental impacts associated with vehicle and personnel access to work sites would be less than significant.

Impacts from Compensatory Mitigation

The Program may require habitat creation, restoration, or enhancement as mitigation for significant impacts to sensitive biological resources. The need for compensatory mitigation is likely low, as most impacts to sensitive communities would be beneficial and/or significant adverse impacts can be avoided. Habitat mitigation projects have the potential to cause some of the same types of impacts as those described in this EIR. For example, mechanical equipment

and personnel associated with a mitigation project could inadvertently transport invasive plant propagules, crush special-status plants, or disturb special-status wildlife. Therefore, all compensatory mitigation projects conducted under the Program shall be subject to the BMPs and mitigation measures incorporated into this EIR.

Analysis of Plans

Vegetation Management Plan

Direct Impacts

Creation and maintenance of VMAs would involve removal of vegetation using a variety of methods. No new roads would be created but transporting mechanical equipment to treatment sites may require the creation of skid trails if the sites are not accessible from existing trails and roads. Typically, mature, healthy trees would not be removed except eucalyptus and acacia. Fuelbreaks and disclines would result in the removal of trees and other vegetation in varying degrees, depending upon the location. Removal of trees, shrubs, and grasses could directly alter or result in conversion of sensitive communities.

The VMP identifies the locations of all potential VMAs and FRAs. Midpen would identify those areas to be created and maintained in each coming year in an Annual Work Plan, with consideration for the higher prioritization areas. As such, only a selection of the potential VMAs could be created and maintained in any given year and it is possible that not all locations identified as a possible VMAs would be created. However, to determine the scale of impacts on mapped sensitive communities, the locations of all potential VMAs were assessed in relation to these communities on Midpen lands by overlaying the GIS layers. The intensity and scale of activities associated with FRAs would not directly impact or fragment sensitive vegetation communities nor result in type conversion. FRAs would include limited vegetation removal and management for ecosystem resiliency.

Midpen's vegetation data layers have not been field verified in all locations, and in some instances, vegetation communities within the potential VMAs have not been classified to the level necessary to determine rarity (i.e., to determine whether they qualify as sensitive natural communities according to the CNPS and CDFW method for mapping and classifying natural communities). The data layers lack precision in some locations due to the inherent difficulty in mapping precise boundaries across large spatial scales. Consequently, mapping limitations preclude the ability to determine the exact acreage of sensitive communities that may be affected by the VMP. This preliminary assessment suggests that the creation and maintenance of VMAs could impact up to 43 of the total 94 sensitive communities that could occur on Midpen lands. Midpen would consult and use new vegetation data as it becomes available throughout Program implementation.

The significance of impacts to sensitive communities depend on: (1) the relative abundance of the community, (2) threats to the community, and (3) whether the community is protected by federal or state regulations (e.g., wetlands). Table 4.4-6 summarizes the areas where mapped potential VMAs overlap with sensitive communities to provide a general understanding of the types and possible scale of impacts. As Midpen purchases or is gifted new land, the types of

sensitive communities that could be affected may change. In any one year, a fraction of the potential VMAs would be created (refer to Table 3.6-1 in Chapter 3.0: Project Description for the maximum acres that could be treated annually). The table categorizes these impacts on the communities into three mitigation groups. Group 1 communities are relatively rare, may be difficult to mitigate, or are protected by federal or state regulations (e.g., Clean Water Act). The impact from implementation of the VMP on Group 1 communities would be significant. Group 2 communities are relatively common in the region, are easier to mitigate, and are not protected by federal or state regulations. Midpen would attempt to avoid direct and indirect impacts to these communities. It may not be possible for Midpen to achieve the Program objectives, however, while also avoiding all impacts to Group 2 communities. Group 3 communities are abundant in the region and are not protected by federal or state regulations. Impacts on Group 3 communities from implementation of the Program would not jeopardize the regional abundance or distribution of these communities. Impacts on Group 3 communities would be less than significant. Impacts on Group 1 and Group 2 communities would be significant. Impacts to sensitive community acreages in Groups 1 and 2 would be mitigated through MM Biology-17, which includes provisions for a qualified biologist or biological monitor working under a qualified biologist to review and assess each project for impacts to sensitive natural communities and to identify spatial buffers or other management actions to reduce potentially significant impacts on the sensitive community, primarily through avoidance. If measures to avoid or minimize impacts are not feasible, MM Biology-18 requires compensatory mitigation for the acreages permanently and negatively impacted from implementation of the VMP and MM Biology-20 requires appropriate evaluation and permitting for impacts to wetlands. With mitigation, the direct impacts would be reduced to less than significant.

Indirect Impacts

The distribution and abundance of weeds is correlated with the severity of disturbance (Hobbs and Huenneke 1992, Stylinski and Allen 1999). As such, treatments that involve substantial disturbance (e.g., discing) are more likely to become dominated by weeds than treatments that involve less disturbance (e.g., shaded fuelbreaks, FRAs). Similarly, VMAs that involve frequent disturbance (e.g., fuelbreak or defensible space maintenance) are more likely to become dominated by weeds than treatments that involve infrequent disturbance (e.g., FRAs) or a single disturbance event.

In a comprehensive study of 24 fuel breaks across California, non-native plant cover was observed to be 200 percent greater along fuelbreaks than in adjacent wildland areas and relative non-native cover was greater on fuelbreaks constructed by bulldozers compared to those constructed by hand or other mechanical equipment (e.g., rubber tired and tracked vehicles, skid steers) (Merriam, Keeley, & Beyers, 2006). Non-natives especially thrived on fuelbreaks that had frequent disturbances caused by fuelbreak maintenance. Treatment activities could spread forest diseases through accidentally transportation (e.g., via vehicles or boots) from infected areas to uninfected areas. The indirect impact would be potentially significant. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive vegetation communities could still remain

significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. Indirect impacts would be reduced to less than significant with implementation of mitigation.

Prescribed Fire Plan

Burn units may have limited mechanical pre-treatment to improve firelines or operational safety. Treatments may include, but are not limited to mowing, mastication, chipping, falling of snags, and brushing of roads. These treatments would be comparable to those conducted under the VMP. Control lines would be used for prescribed fires. Where feasible and effective, existing control lines (e.g., existing roads or disclines) would be used. Vegetation on or near the lines may need to be cleared. If new control lines are needed, vegetation would be cleared along the new line, which would generally be less than 2 meters wide. These lines would be temporary, and these features would be rehabilitated following mop up of the prescribed burn. Similar to the VMP, these types of activities have the potential to significantly impact sensitive vegetation communities either directly or indirectly through spread of invasive species and forest diseases.

Personnel and equipment used during the burn could accidentally spread forest diseases and invasive species. Aboveground temporary pipelines may be used to fill water tanks that are not readily accessible by a water tender or water supply lines. Temporary pipelines could crush immature vegetation; however, this impact would be minimal and would not threaten persistence of any sensitive communities. Prescribed burns conducted under the Program are designed to improve ecosystem health and resiliency. The primary threat that fire poses to sensitive communities is disturbance, which can enhance or impede persistence of invasive plants dependent upon many factors described above. The indirect impact from spread of invasive species and forest diseases caused by prescribed burns could be significant. The burn area would be patrolled by Midpen EDRR crews. As part of the Program, Midpen would implement a monitoring and adaptive management approach to prescribed burning conducted. The impact on sensitive vegetation communities from invasive species could remain significant. Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts could still remain significant. MM Biology-4 requires Midpen to implement techniques to minimize the spread of invasive species and forest diseases. MM Biology-5 requires Midpen's EDRR program to monitor for and eliminate any invasive species that colonize the burn scar. MM Biology-17 also requires that prescribed burn areas are surveyed by a qualified biologist or biological monitor working under a qualified biologist to incorporate any site-specific measures to protect sensitive communities. Impacts associated with prescribed burning would be less than significant with mitigation.

Table 4.4-6 Potentially Occurring Sensitive Natural Communities in Potential VMAs

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	Upland Vegetation Types				
Grassland	Ashy ryegrass – Creeping Ryegrass Turfs (S3)	Possible	--	--	2
	California Annual Grasslands Series (BHS)	Present and Possible	777.25 (12.6%)	DISC, EUC, FAR, FB, FRA, FML, SFB, IER	3
	California Annual Grasslands with a Native Component Mapping Unit (BHS)	Present and Possible	3.86 (11.0%)	FB, FML	2
	California Brome – Blue Wildrye Prairie (S3)	Possible	--	--	2
	California Oat Grass Prairie (S3)	Possible	--	--	2
	Gum Plant Patches (S2)	Possible	--	--	2
	Idaho Fescue Grassland (S3?)	Possible	--	--	2
	Mixed California Annual Grassland – Purple Needlegrass Association (BHS)	Present and Possible	7.18 (31.2%)	EUC, FB, SFB	2
	Purple Needlegrass Grassland (S3)	Possible	--	--	2
Coastal Scrub	Bush Monkeyflower Scrub (S3?)	Possible	--	--	3
	California Sagebrush Series (BHS when on serpentine)	Possible	--	--	3
	Coastal Brambles (S3)	Possible	--	--	2
	Coyote Brush – Oceanspray Scrub (S3)	Present and Possible	110.66 (4.5%)	DISC, EUC, FAR, FB, SFB, IER	2
	Coyote Brush Series (BHS when on serpentine)	Present and Possible	0.44 (46.3%)	--	1
	Hazelnut Scrub (S2?)	Possible	--	--	1

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	Ocean Spray Brush (S3)	Possible	--	--	3
	Poison Oak Series (BHS when on serpentine)	Present and Possible	0.51 (85.0%)	FB, IER	3
Chaparral	Big Berry Manzanita Series (BHS when on serpentine)	Present and Possible	10.71 (11.3%)	FB, FML, SFB, IER	1
	Birch-leafed Mountain Mahogany – Mesic Chaparral Mapping Unit (BHS when on serpentine)	Present and Possible	5.02 (11.0%)	FB, FML, SFB, IER	1
	Brittle Leaf Manzanita Chaparral (S3)	Possible	--	--	2
	Brittle-leaf Woolly Leaf Manzanita Chaparral (S3)	Possible	--	--	2
	Chamise – Mixed Manzanita Multiple Series Mapping Unit (BHS when on serpentine)	Present and Possible	6.75 (14.1%)	FB, FML	1
	Chamise – Mixed Oak Multiple Series Mapping Unit (BHS when on serpentine)	Present and Possible	0.50 (2.3%)	SFB, IER	2
	Chamise Series (BHS when on serpentine)	Present and Possible	0.34 (1.3%)	FB	3
	Chamise – Wedge-leaf Ceanothus Series (BHS when on serpentine)	Possible	--	--	2
	Chamise – Woolly leaf Manzanita Series (BHS)	Present and Possible	1.5 (2.0%)	EUC, FB, SFB	2
	Glossy Leaf Manzanita Chaparral (S2)	Possible	--	--	2
	Golden Chinquapin Thickets (S2)	Possible	--	--	2
	Hairy Leaf – Woolly Leaf Ceanothus Chaparral (S3)	Possible	--	--	2

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	Scrub Oak Chaparral (S3)	Present and Possible	51.09 (10.0%)	EUC, FB, FML, IER	2
	Serpentine Chamise Chaparral (S3)	Present and Possible	0.34 (1.3%)	FB	1
	Wart Leaf Ceanothus Chaparral (S3)	Possible	--	--	2
Oak Savanna	Blue Oak/California Annual Grasslands Association (BHS)	Present and Possible	3.5 (28.4%)	FB	2
	Blue Oak Series (BHS)	Possible and Present	0.35 (8.6%)	FB	2
	Blue Oak Woodland Mapping Unit (BHS)	Possible and Present	3.46 (8.9%)	DISC, EUC, FB	2
	Valley Oak Woodland and Forest (S3/BHS when on serpentine)	Present and Possible	4.67 (6.8%)	DISC, DS, FB, SFB	2
Hardwood Forest	Black Oak/Madrone (Coast Live Oak) Mapping Unit (BHS)	Present and Possible	5.57 (13.6%)	FB, SFB	2
	Black Oak Mapping Unit (BHS)	Present and Possible	11.71 (14.1%)	DS, FB, SFB	2
	California Bay Forest and Woodland (S3/BHS when on serpentine)	Present and Possible	26.18 (2.5%)	DS, EUC, FB, SFB, IER	3
	California Bay and Canyon Live Oak Forest (S3?)	Present and Possible	75.55 (1.6%)	EUC, FAR, FB, FML, IER	3
	California Bay and Coast Live Oak Forest (S3/BHS when on serpentine)	Present and Possible	161.17 (6.9%)	EUC, FAR, FB, FRA, FML, SFB, IER	3
	California Buckeye Groves (S3)	Present and Possible	12.15 (3.8%)	FB, FML, SFB, IER	3

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	Coast Live Oak Series (BHS when on serpentine)	Possible	4.10 (18.3%)	FB	3
	Shreve Oak Forests (S2)	Possible	--	--	2
	Madrone Forest (S3.2)	Possible	--	--	2
	Tanoak – California Bay Forest (S3)	Present and Possible	28.38 (3.4%)	FB, SFB, IER	2
	Tanoak Forest (S3.2)	Possible	--	--	2
Conifer Forest	Douglas Fir – California Bay Association (BHS)	Possible	--	--	3
	Douglas Fir – Coast Live Oak Forest and Woodland (S3?)	Possible	--	--	3
	Douglas Fir and Giant Chinquapin (S3)	Possible	--	--	2
	Douglas Fir – Mixed Hardwoods Mapping Unit (BHS when on serpentine)	Possible	--	--	3
	Douglas Fir – Tanoak Forest and Woodland (S3)	Possible	--	--	3
	Foothill Pine – Big Berry Manzanita Association (BHS when on serpentine)	Present and Possible	3.58 (22.4%)	FB	1
	Foothill Pine – Canyon Live Oak Association (BHS when on serpentine)	Possible	--	--	1
	Knobcone Pine Series (BHS when on serpentine)	Possible	1.30 (7.2%)	FB, FML, SFB	1
	Redwood/Douglas Fir/California Bay Forest and Woodland (S?)	Possible	--	--	3
	Redwood/Douglas Fir/Tanoak Forest and Woodland (S?)	Possible	--	--	3
	Redwood Forest and Woodland (S3.2)	Possible	64.63 (9.8%)	FAR, FB, FML, SFB, IER	2

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	Redwood/Tanoak/Huckleberry Forest (S3)	Possible	15.75 (0.4%)	FAR, FB, FRA, FML, SFB, IER	2
Riparian	Arroyo Willow – Red Willow Riparian Woodland (S3)	Possible	--	--	1
	Arroyo Willow Thickets (S?)	Present and Possible	11.08 (3.5%)	DS, EUC, FB, IER	1
	Bigleaf maple forest and woodland (S3/BHS when on serpentine)	Present and Possible	10.84 (5.0%)	FB, FML	2
	Black cottonwood forest and woodland (S3)	Possible	--	--	1
	Blue elderberry stands (S3)	Possible	--	--	2
	Box-elder forest and woodland (S2/BHS)	Present and Possible	0.27 (31.7%)	FB	1
	California sycamore woodlands (S3/BHS)	Present and Possible	5.13 (66.6%)	FB	1
	Central Coast Riparian Forest (BHS)	Present and Possible	0.97 (1.2%)	DS, FB, SFB	1
	Fremont cottonwood forest and woodland (S3)	Possible	--	--	1
	Goodding's willow – Red Willow Riparian Woodland and Forest (S3)	Possible	--	--	1
	Red Alder and Arroyo Willow Forest (S3)	Present and Possible	33.61 (12.0%)	EUC, FB, FML, IER	1
	Shining Willow Groves (S3)	Possible	--	--	1
	Sitka Willow Thickets (S3?)	Possible	--	--	1
	Wax Myrtle Scrub (S3)	Possible	--	--	1

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	White Alder Series (May qualify as SNC depending on associates)	Present and Possible	28.31 (6.7%)	FB, SFB, IER	1
Barren / Rock	Landslides, Cliffs, Rock Outcrops (BHS)	Present and Possible	11.09 (9.3%)	FB, FML, IER	1
	Aquatic Vegetation Types				
Wetland	Alkali Heath Marsh (S3)	Possible	--	--	1
	American Bulrush Marsh (S3)	Present and Possible	0.35 (100%)	DS, FB	1
	Meadow Barley Patches (S2/BHS)	Present and Possible	2.44 (57.1%)	DISC, FB, FML, IER	1
	Cattail Series	Present and Possible	0.35 (4.8%)	DISC, DS, FB	1
	Common Monkey Flower Seeps (S3?)	Possible	--	--	1
	Field Horsetail – Scouring Rush Horsetail – Variegated Scouring Rush Wet Meadow (S3)	Possible	--	--	1
	Hardstem and California Bulrush Marshes (S3)	Possible	--	--	1
	Iris-leaf Rush Seeps (S2?)	Possible	--	--	1
	Sand Dune Sedge Swaths (S3?)	Possible	--	--	1
	Sedge – Juncus Meadow Mapping Unit (BHS)	Present and Possible	0.05 (0.6%)	DISC, FB, SFB	1
	Slough Sedge Swards (S3)	Possible	--	--	1
	Torrent Sedge Patches (S2?)	Possible	--	--	1
	Coastal Salt Marsh/Coastal Brackish Marsh	Possible	--	--	1

General Type	Sensitive Natural Community	Potential to Occur	Acres in Treatment Areas (Percent of baseline)	Impact types	Mitigation Group
	Wetland (unclassified)	Present and Possible	1.41 (2.0%)	FAR, FB, FML, SFB, IER	1
Water	Ditch-grass or Widgeon-grass Mats (S2)	Possible	--	--	1
	Pondweed Mats (S3?)	Possible	--	--	1
	Small Ephemeral Ponds (BHS)	Possible	--	--	3
	Reservoirs (BHS)	Possible	--	--	3
	Water (BHS)	Possible	--	--	3

Notes:

DISC: Discline

DS: Defensible Space

EUC: Eucalyptus and Acacia Removal

FAR: Fire Agency Recommended Fuelbreaks

FB: Fuelbreak/Non-Shaded Fuelbreak

FML: Fire Management Logistics Areas

IER: Ingress/Egress Route Fuelbreak

SFB: Shaded Fuelbreak

BHS: Biologically Highly Significant Community which are derived from Midpen's Conservation Atlas and current vegetation spatial dataset (Midpen, 2014a; Midpen, 2018)

S-Ranks 1-3 are included and appear at the end of the California Vegetation name. These ranks indicate Sensitive Natural Community status (CDFW, 2019). A rank of S1 indicates a vegetation alliance or association as "Critically Imperiled" because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction (NatureServe 2020). A rank of S2 indicates a vegetation alliance or association as "Imperiled" because of rarity due to very restricted range, few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction (NatureServe 2020). A rank of S3 indicates a vegetation alliance or association is "Vulnerable," meaning it is at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors (NatureServe 2020). A rank of S? denotes that although insufficient samples exist for the full expected range of a community.

The locations and extents of prescribed burns have not been identified to the same level of detail as the other proposed activities. Prescribed burn units will be defined in more detail in a future amendment to the PFP of the WFRP. Prescribed fire burn units will generally be of continuous vegetation types. Units are sized to allow a prescribed fire to be implemented in one operational period (typically an 8- to 12-hour shift). Prescribed burns will generally be prioritized by vegetation type, fuels reduction value, and potential for implementation. Considerations for prioritization will be defined in the future, but may include condition of area, in terms of forest health, invasive species, and fuel loads; location and ability to manage the burn; and type of vegetation with consideration for improvement of ecosystem function through prescribed burning. Through the careful planning of prescribed burns by vegetation type and size consideration, the prescribed burns would be designed to improve the health and resiliency of protected sensitive communities.

Wildland Fire Pre-Plan

Improvements or installation of new firefighting infrastructure, including roads, water storage tanks, and fire management logistics areas would involve use of manual and mechanical methods. Construction personnel and equipment could inadvertently transport *Phytopthora sp.* or invasive plant propagules to the work sites. Improvements on existing road rights-of-way or potentially new access roads in areas where adequate access is lacking may be needed. Existing access roads may be widened to allow for larger firetrucks, turnarounds may be installed, and road extensions may be built for improved access. Road surfaces may also be graded, and material placed on the surface, such a composite, to create a safer surface for travel by emergency vehicles. Infrastructure improvements to facilitate firefighter access could directly and permanently remove or convert sensitive communities.

New emergency fire management logistics areas (e.g., staging and helicopter landing areas) may be needed at some OSPs and other lands managed by Midpen. Where possible, these areas would be sited on a level area and away from water bodies, sensitive communities, and riparian corridors. New logistics areas would be maintained annually or bi-annually via mowing with a tractor or brushcutter.

Water storage tanks may be built in areas where needed and feasible. New hydrants, pumps, and associated pipelines may also be installed. Pipelines may be aboveground or underground. New infrastructure could directly and permanently impact sensitive communities, depending on their locations. Impacts associated with the installation of new logistics areas would depend on the vegetation communities in those areas. As discussed above, mowing does not significantly impact sensitive grassland communities. However, the installation and maintenance of new logistics areas in other sensitive communities (e.g., chaparral or coastal scrub) could eliminate those communities (within the logistics areas). The indirect and direct impact could be significant.

Midpen implements invasive species and forest disease BMPs to minimize spread and proliferation (IPMP BMPs 11 through 18). Impacts on sensitive vegetation communities could still remain significant. MM Biology-4 requires Midpen to implement techniques to minimize

the spread of invasive species and forest diseases. MM Biology-5 identifies specific baseline data collection and monitoring frequency for Midpen's EDRR program and success criteria to be met. MM Biology-17 includes additional avoidance and minimization measures to minimize impacts to sensitive communities and MM Biology-18 requires compensatory mitigation for permanent impacts to sensitive communities that cannot be avoided or minimized. MM Biology-19 includes measures to ensure that any impacts to jurisdictional waters are properly permitted. Mitigation would reduce the impacts on sensitive vegetation communities to less than significant.

Impact Biological Resources-3: Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	**Significance Determination**
	Less than significant with mitigation

Wildlife Movement

Midpen lands contain substantial amounts of both terrestrial and aquatic habitats that are largely contiguous and unfragmented. Although several major roadways are present within and between many of Midpen's OSPs, the overall preserve system functions as a critically important regional wildlife corridor linking the northern portion of the San Francisco Peninsula, coastal areas in the west, and the Santa Cruz Mountains in the south. Much of Midpen lands are classified as Last Remaining Linkages by the Conservation Lands Network, indicating that Midpen lands are highly important to overall landscape connectivity in the San Francisco Bay Area (Open Space Council, 2019).

Some modification of existing natural habitats can be expected to occur due to vegetation management, prescribed fire, and installation of firefighting infrastructure as analyzed in Impact Biological Resources-1 and Impact Biological Resources-2. However, vegetation changes would not occur such that habitats would become unsuitable to wildlife or prohibit their movement. Fuelbreaks would predominantly occur near existing roads, although not always. Cover would be reduced in fuelbreaks as work typically involves the thinning of vegetation and clearing of understory. The width of these fuelbreaks are generally 200 feet or less. Wildlife traveling through fuelbreaks may be exposed to some risks of exposure; however, it should not impede their movement through the area. The Program also includes the designation of refugia in FRAs to minimize disturbance from anthropogenic activities.

Temporary disturbance to wildlife movement may occur during vegetation management work and during and after prescribed burns, but these disturbances would be temporary in nature and would not result in permanent detrimental changes to wildlife passage. Furthermore, no Program activities are permitted that would obstruct or otherwise create passage barriers in any streams or waterways. The impact on wildlife movement would be less than significant.

Native Wildlife Nursery Sites

Numerous wildlife species breed on Midpen lands, including many of the special-status wildlife species analyzed under Impact Biological Resources-1. Disturbance from vegetation

management activities, prescribed burn pre-treatment and implementation, and the installation of wildland firefighting infrastructure could cause impacts on native wildlife nursery sites through direct destruction (e.g., nest or burrow destruction from heavy equipment use), siltation or spills into water bodies containing eggs or young of aquatic species, or disturbance from noise or smoke causing nest or roost abandonment. The designation of refugia in FRAs would help to reduce impacts, but the impact on breeding species and nursery sites could remain significant. IPMP BMP 21 requires implementation of a training program that would describe special-status species and how to avoid harming the species. IPMP BMP 22 requires nesting bird surveys and implementation of buffers around observed active nests. IPMP BMP 29 requires implementation of CDFW noise requirements if activities are conducted during the breeding season in areas where murrelets could nest. Implementation of Midpen's fueling, spill prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2; IPMP BMP 28) would reduce the impact of erosion and accidental spills of fuels or lubricants from equipment, vehicles, and work areas into aquatic areas where species could be breeding. Midpen implements nesting bird training for workers conducting certain activities and sends out informational reminders to workers during the nesting season (Midpen, 2019b). Midpen requires implementation of BMPs for avoiding and minimizing impacts on the special-status bats designated as California species of special concern (e.g., Townsend's big-eared bat, pallid bat, and western red bat). Midpen requires implementation of Midpen's San Francisco Dusky-Footed Woodrat Protocol that identifies measures for avoiding and minimizing impacts on woodrats. The impact on some breeding species would remain potentially significant. MM Geology-1 requires implementation of design features to minimize erosive effects of livestock trails, which would ensure that overgrazing and soil compaction does not occur that could result in crushing of burrows. MM Geology-2 requires a buffer distance between prescribed and pile burns around streams and other erosion control measures to minimize effects from sedimentation on aquatic breeding species. Measures in the MOU with CDFW from programmatic permitting activities would also be implemented as well as measures identified in the USFWS Section 10(a)(1)(A) Recovery Permit for California red-legged frog. MM Biology-7 requires surveys for California red-legged frog egg masses prior to activity in suitable habitat. MM Biology-9 requires avoidance of western pond turtle nests. MM Biology-11 identifies specific survey radii and monitoring protocol for nests and nesting birds. MM Biology-16 identifies buffer distances needed to avoid harm to birds from burning. With the implementation of these measures, impacts on native wildlife nursery sites would be less than significant.

Impact Biological Resources-4: Conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or adopted HCP, Natural Community Conservation Plan (NCCP), or other approved local, regional, or State HCP.	Significance Determination
	Less than significant with mitigation

Santa Clara Valley Habitat Plan

Midpen lands intersects with a small portion of the area covered by the Santa Clara Valley Habitat Plan (VHP) (approximately 200 acres of Sierra Azul OSP), which was adopted in 2013. The VHP is an HCP and NCCP, which encompasses a 519,506-acre area in Santa Clara County. The VHP was developed by the County of Santa Clara, Santa Clara Valley Water District, Santa Clara Valley Transportation Authority, and the cities of Gilroy, Morgan Hill, and San Jose ("Permittees") in conjunction with the USFWS and CDFW (ICF International 2012). The purpose of the VHP is to provide a framework for promoting the protection and recovery of natural resources, including endangered and threatened species, while streamlining the permitting process for planned development, infrastructure, and maintenance activities ("covered activities") under the jurisdiction of the Permittees. Specifically, the VHP authorizes incidental take of 18 "covered species," many of which are listed under the FESA or CESA. In exchange for receiving take authorization from the USFWS and CDFW, the VHP requires permittees to successfully implement a conservation strategy to offset the impacts of covered activities.

Midpen is not a signatory of the VHP. Therefore, Midpen is not bound to the terms of the VHP unless it elects to seek incidental take coverage through the VHP. The Program is consistent with the purpose of the VHP (i.e., protection and recovery of natural resources, including endangered and threatened species). Various Program activities could be conducted within the VHP boundary including creation and maintenance of fuelbreaks, prescribed burns, and other vegetation management activities. As analyzed under Impact Biological Resources-1, Program activities have the potential to significantly impact several species, including those covered by the VHP (e.g., California red-legged frog, Bay checkerspot butterfly, most beautiful jewelflower). Midpen BMPs and standard measures and MM Biology-1 through MM Biology-17, discussed in detail under Impact Biological Resources-1, would ensure that impacts on special-status wildlife and plants as well as nesting birds are reduced to less than significant.

Local Coastal Program

A portion of Midpen lands is located within the Coastal Zone as defined under the California Coastal Act (Public Resources Code Section 30103). Program activities conducted in the Coastal Zone would be subject to the policies of San Mateo County's LCP. All development in the Coastal Zone requires either a Coastal Development Permit or an exemption from Coastal Development Permit requirements. For a permit to be issued, the development must comply with the policies of the LCP and those ordinances adopted to implement the LCP. Section 30106 of the Coastal Act defines development as: "the placement or erection of any solid material or structure…and the removal or harvesting of major vegetation other than for agricultural purposes, kelp harvesting, and timber operations which are in accordance with a timber

harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973." Based on this definition, the Program activities, including vegetation management and installation of firefighting infrastructure, would constitute "development" within the Coastal Zone (California Coastal Commission 2019; County of San Mateo 2013). To comply with the California Coastal Act, Midpen would need to apply for a Coastal Development Permit or an exemption from Coastal Development Permit requirements prior to conducting any activity that constitutes development in the Coastal Zone. The impact would be less than significant with permit or permit exemption compliance.

Local Tree Ordinances

The vast majority (approximately 90 percent) of the Midpen OSPs and managed lands are within San Mateo County and Santa Clara County. The remaining 10 percent falls within various cities and towns.

A "significant tree" in San Mateo County is any live woody plant rising above the ground with a single stem or trunk of a circumference of 38 inches or more measured at 4.5 feet vertically above the ground or immediately below the lowest branch, whichever is lower, and having the inherent capacity of naturally producing one main axis continuing to grow more vigorously than the lateral axes (Section 12,012 of the Significant Tree Ordinance). A permit is required to directly or indirectly remove or kill a significant tree. Permit applications are submitted to the San Mateo County Planning Department for a Tree Cutting Permit. Approval is contingent on certain conditions. It would be rare that a healthy tree of this size would need to be removed under the Program; however, should removal of trees this size be required, it should qualify under one of the exemption criteria (e.g., Section 12,023 (a)(11) is a substantial fire hazard) identified in the San Mateo County Significant Tree Ordinance. Tree cutting in the Resource Management, Timberland Production Zone, and Planned Agricultural districts, except within 100 feet of any County or State scenic road or highway, as identified in the San Mateo County General Plan, are exempt from needing a permit as long as the conditions of Section 12.020.3 are met. San Mateo County also regulates the removal of heritage trees per ordinance Section 11.050.

Santa Clara County defines protected trees in Section C16-3 of the Municipal Code. A protected tree is defined as "Any tree having a main trunk or stem measuring 37.7 inches or greater in circumference (12 inches or more in diameter) at a height of 4.5 feet above ground level, or in the case of multi-trunk trees a total of 75.4 inches in circumference (24 inches or more of the diameter) of all trunks in the following areas of the County:

1. parcels zoned "Hillsides" (3 acres or less)
2. parcels within a "-d" (Design Review) combining zoning district
3. parcels within the Los Gatos Specific Plan area."

The Santa Clara County ordinance also defines a protected tree as any tree, regardless of size, within road rights-of-way and easements of the County, whether within or outside the unincorporated territory of the County. Permits are needed for tree removal, either an Encroachment Permit from Road and Airports Department or an Administrative Permit from

the County Planning Office. Other jurisdictions' tree ordinances would also apply to Program work.

If trees were removed in violation of a local permit, a significant impact would occur. To ensure compliance with various tree ordinances, MM Biology-20 would be implemented, which requires a survey of trees in removal areas to identify if any trees meet the requirements of the local jurisdiction's requirements. The survey must identify the trees that meet ordinance requirements and provide the information needed to apply for the appropriate tree removal permit, if needed. With implementation of the mitigation, impacts would be less than significant.

4.4.7 Mitigation Measures

MM Biology-1: Training, Monitoring, and Reporting

Monitoring

- The biological monitor(s) or qualified biologist(s) shall have the authority to stop Program activities to avoid take or impacts to special-status species or protected biological resources; in the event of unforeseen circumstances (e.g., unanticipated impacts are occurring); or if Program personnel are not complying with regulatory permit conditions and the BMPs listed herein. The biological monitor or qualified biologist shall possess the necessary agency approvals or permits required for involvement in Program activities.
  - A **biological monitor** is an individual who has a minimum of 2 years academic and 1 year professional experience in biological sciences and related resource management activities, is able to identify species that may be present within the work area, and is familiar with the habits and behavior of those species.
  - A **qualified biologist/botanist** is an individual who has a minimum of a 4-year academic degree in biological sciences or related resource management activities, with a minimum of two survey seasons years (e.g., two seasons during the blooming season of sensitive plants) conducting surveys for each species that may be present within the work area.
  - A **professional biologist/botanist** is an individual who has a minimum of 5 years of academic training in biological sciences or related studies and 3 or more years of professional experience conducting protocol-level wildlife and/or florist field surveys.
  - A **Midpen-approved biologist/botanist** is an outside consultant who has been approved by Midpen either by a professional biologist/botanist, Resource Advisor or other appropriate individual, to conduct biological monitoring and surveying activities. This individual can be any one of the three categories of biologist/botanist described above.
  - A **Resource Advisor** is an individual who provides professional knowledge and expertise for the protection of resources (e.g., biological and cultural resources), within an emergency incident environment.
- The qualified biologist or biological monitor shall conduct on-site monitoring of Program activities that have the potential to impact sensitive biological resources. The monitoring requirements (e.g., frequency and duration) shall depend on the specific activity(ies) being performed and the ecological sensitivity of the site (e.g., the potential for soil erosion or occurrence of special-status wildlife). Some activities shall warrant full-time monitoring by one or more biologists and/or biological monitors; whereas weekly site inspections may be sufficient for other activities. At a minimum, monitoring shall be conducted frequently enough to ensure compliance with permit conditions and BMPs. The monitor shall maintain a log that documents: (a) the monitoring dates, (b) areas and activities monitored, (c) compliance with permit conditions and BMPs, (d) any remedial actions that were taken (or are needed).
- Post-activity monitoring shall also occur, with the scope and timing dependent on the potential for risks to biological resources. The purpose of monitoring is to ensure that special-status plant species and sensitive communities were avoided and are not experiencing negative indirect impacts from activities. If negative

MM Biology-1: Training, Monitoring, and Reporting

impacts are observed or are potentially occurring, restoration measures shall be implemented, and modifications made to future activities to avoid similar impacts.

Pre-Activity General Survey and Flagging

A qualified biologist or biological monitor working under a qualified biologist shall survey all selected work areas shortly before work to assess general conditions and determine environmental considerations as required by IPMP BMPs 21 and 25. Prior to Program activities, the biologist or biological monitor shall use flagging (or other methods) to clearly delineate the work area and any areas that shall be avoided (e.g., sensitive communities, habitat for special-status species).

Reporting

Information on new localities or sightings for special-status species shall be reported to the Sacramento USFWS Office and the California Natural Diversity Database (CNDDB) annually. Information on any incidental capture, injury, or mortality of special-status species shall be immediately reported within 3 working days of their discovery or in accordance with the federal and State permit conditions. The data shall also be logged in Midpen's electronic inventory system identified in IPMP BMP 25.

Training

- Prior to commencing a Program activity, all personnel shall attend a worker environmental awareness training program conducted or prepared by the qualified biologist or biological monitor working under a Midpen-approved biologist as required by IPMP BMP 21.
- The worker environmental awareness training will include a brief review of the life history, field identification, and habitat requirements of each special-status species that could potentially be present on-site, their known or probable habitat types and locations, potential fines for violations, avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered, as required by IPMP BMP 21. In addition, the training shall include information on:
  - All BMPs, regulatory permit conditions, exclusion areas, and other work restrictions.
  - Color coding for flagging used to demarcate work areas, staging areas, skid trails, watercourses, and exclusion zones (e.g., around special-status plants and other sensitive biological resources).
  - The identification and reproductive biology of invasive plants.
  - *Phytopthora ramorum* and other plant pathogens avoidance.

General Wildlife Protection Measures

- Qualified biologists/biological monitors shall check for any reptiles, amphibians, or other animals under vehicles and equipment parked for more than 30 minutes.
- Some individual live, dead, or dying trees shall be retained as snags where recommended by the qualified biologist and biological monitor and where leaving the tree would not increase fire hazards or be a safety concern.
- Vehicles traveling to and from the work areas off of established roads and trails, in sensitive plant or wildlife habitat, must travel slowly (5 mph) and be preceded by a monitor to ensure that wildlife shall not be run over by the passing vehicle. Vehicle monitors do not need to be trained biologists.
- Qualified biologists/biological monitors are required to temporarily stop any work that they believe may harm special-status species. Work shall not resume until a satisfactory method is agreed upon to minimize or avoid take of the species.
- Qualified biologists/biological monitors may require staging areas or stockpiled equipment/materials to be fenced with USFWS and/or CDFW-approved exclusion fencing if there is potential for special-status species to enter the areas and become entrapped, and routine inspection of the area is not adequate to ensure that species are not present. Fencing shall be inspected by a qualified biologist/biological monitor and maintained daily as needed to ensure its proper function in excluding wildlife. Large-scale fencing around entire

MM Biology-1: Training, Monitoring, and Reporting

vegetation management areas is discouraged due to the habitat disruption associated with fence installation and removal.

Applicable Location(s): All Midpen lands.

Performance Standards and Timing:

- **Before Activity:** (1) Survey all selected work areas and (2) conduct worker environmental awareness training program.
- **During Activity:** (1) Conduct on-site monitoring, (2) immediately report information on any incidental capture, injury, or mortality of special-status species, (3) temporarily stop any work that may harm special-status species, and (4) inspect vehicles, equipment, and fencing daily.
- **After Activity:** Conduct post-activity monitoring.

MM Biology -2: Special-Status Plants

Pre-Activity Special-Status Plant Survey

As required by IPMP BMP 25, a biological monitor or qualified biologist shall survey the work site to determine the potential presence of special-status plants (as defined under Section 4.4.2 in the Program EIR) and document any observations. The abundance and spatial distribution of all special-status plants and sensitive natural communities detected during the surveys shall be recorded with a GPS unit and entered online into the CalFlora and Midpen's GIS databases. This information shall also be submitted to the CNDDB, per MM Biology-1. If any special-status plants are found to occur in the activity footprint, the biologist/botanist shall evaluate the potential level of impacts the activity could have on the plant species, either an individual or population, based on its biology and the nature of the activity (no impact, low impact, or moderate/high impact). Activities with no or low impact can proceed. If an activity could have a moderate or high impact (e.g., anticipated mortality) Midpen shall consult with CDFW and the appropriate avoidance or minimization measures would be implemented, depending on the species' rank, physiology, and habitat requirements, as described below.

Species to Avoid (Unless Population Could Benefit from Program Activity, such as Prescribed Burning)

Program activities shall avoid impacts to State or federally listed plants that are known to occur or have the potential to occur on Midpen lands:

- Ben Lomond spineflower
- Butano Ridge cypress
- California seablite
- Coyote ceanothus
- Crystal Springs fountain thistle
- Dudley's lousewort
- Marin western flax
- Metcalf Canyon jewelflower
- Monterey spineflower
- Pacific Grove clover
- Robust spineflower
- Rock sanicle
- San Francisco popcornflower
- San Mateo thorn-mint
- San Mateo woolly sunflower
- Santa Clara Valley dudleya
- Santa Cruz cypress
- Santa Cruz tarplant
- Santa Cruz wallflower
- Scotts Valley polygonum
- Scotts Valley spineflower
- Two-fork clover
- White-rayed pentachaeta

MM Biology -2: Special-Status Plants

In addition, Program activities shall avoid impacts to the following species that (a) have very specific habitat requirements that are hard to replicate at a mitigation site; (b) are difficult to transplant or propagate; or (c) have insufficient data on the ability to successfully transplant, relocate, or reintroduce the taxa:

- Anderson's manzanita
- Kings Mountain manzanita
- Clustered lady's-slipper
- Mountain lady's-slipper
- Loma Prieta hoita
- Arcuate bush-mallow
- Most beautiful jewelflower

Activities that could have a moderate or high impact on these species shall not occur within an appropriate buffer (as determined by a qualified biologist/botanist or biological monitor working under a qualified biologist) of any individuals or populations identified. Disclines or firefighting infrastructure shall be relocated to avoid any populations of these species.

Prescribed herbivory and prescribed burning shall be allowed in the habitats for these species if, in the professional opinion of a qualified biologist/botanist or biological monitor working under a qualified biologist, the activity shall provide a long-term benefit to the plant (e.g., by eliminating non-native plants).

Minimization of Impacts for All Other Special-Status Species

Midpen shall implement the following approach for all other special-status plant species that have been detected, or that are detected in the Program area during the pre-activity surveys conducted per MM Biology-1 (adding specificity to IPMP BMP 21, which requires developing site-specific measures):

- A qualified biologist/botanist or biological monitor working under a qualified biologist shall recommend spatial buffers or other management actions. The buffer size needed to protect a special-status plant from adverse edge effects (indirect impacts) is dependent on the specific species, threats to the species, existing disturbances, and the habitat's permeability to those threats (CBI 2000). Midpen shall implement the botanist's recommendations. Impacts to a special-status plant shall only occur if it is the botanist's professional opinion that the impact shall provide a long-term benefit to the plant (e.g., by eliminating non-native plants or another threat to the species). If Midpen is unable to implement the botanist's recommendations, or if there is uncertainty regarding the effects of a Program activity on the special-status plant population, Midpen shall assess subsequent effects on the plant population through post-activity monitoring. If the monitoring indicates the Program activity has negatively impacted the plant population, the compensatory mitigation terms of MM Biology-3 shall apply. If the monitoring indicates the effects were positive or neutral, no additional mitigation is required.
- If Program activities are proposed to be conducted in habitat for a special-status plant, the activities shall be conducted during the phenological stage least sensitive to disturbance, based on guidance from the botanist.
- If Program activities are proposed to be conducted in habitat for a special-status plant, and the work must be conducted when the plant is sensitive to disturbance (e.g., during the growing season), Midpen shall assume the plant could be permanently impacted and shall either:
  - 1a. Monitor the response of the plant post-construction. If the study indicates the Program activity has negatively impacted the plant population, the terms of MM Biology-3 shall apply.
  - 1b. Attempt to salvage any special-status plants that are permanently impacted by a Program activity (e.g., plants within a proposed discline). Salvaged plants (and seeds) shall be used for the compensatory mitigation required under MM Biology-3, and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. Any supplemental plants (or seeds) needed for a mitigation project, site rehabilitation, or other application shall be derived from locally appropriate genetic material and nurseries that comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible; or
  - 2. Provide compensatory mitigation in accordance with the terms of MM Biology-3.

MM Biology -2: Special-Status Plants

General Minimization and Avoidance Measures

Burn piles shall not be located within 50 feet of a special-status plant except those species that a qualified biologist/botanist or biological monitor working under a qualified biologist determines shall benefit from burning (e.g., Kings Mountain manzanita). Propane flaming shall not be conducted within the vicinity of special-status plants that could be accidentally damaged by the flaming activities. Vegetative debris shall not be placed on top of special-status plants, unless the biologist/botanist determines this is acceptable.

Applicable Location(s): Any area where Program activities occur near special-status plant species.

Performance Standards and Timing:

- **Before Activity:** Survey the work site to determine the potential presence of special status plants and document and report accordingly.
- **During Activity:** (1) Avoid impacts to State or federally listed plants, (2) implement botanist's recommendations for spatial buffers or other management actions, and (3) implement general avoidance and minimization measures.
- **After Activity:** Attempt to salvage any special-status plants that are permanently impacted by a Program activity.

MM Biology-3: Compensatory Mitigation for Impacts to Special-Status Plants

Midpen shall provide compensatory mitigation for any special-status plant population that is permanently and negatively impacted by Program activities (i.e., could not be avoided or benefited through activities and subsequent monitoring determines an adverse effect to the population where a decline in the population is attributable to the Program activities, per MM Biology-2). Compensatory mitigation may be accomplished through habitat preservation, creation, restoration, or enhancement as determined appropriate by Midpen's qualified biologist/botanist or biological monitor working under a qualified biologist, in consultation with CDFW. All compensatory mitigation projects shall include a mitigation plan outlining the strategy, and the plan must be approved by CDFW, including identification of the success thresholds established depending on the population and site conditions.

The compensation ratio for planting shall be no less than 3:1 (plants at mitigation site/plants at impact site). Under some circumstances a higher ratio may be needed, which shall be determined by Midpen's qualified biologist/botanist or biological monitor working under a qualified biologist, in consultation with CDFW.

If habitat enhancement is selected, the compensation ratio shall be no less than 6:1. If possible, compensatory mitigation shall occur on lands under Midpen's control. Mitigation sites on Midpen land shall include provisions for protecting them from impacts caused by other projects or programs (existing and future). Compensatory mitigation shall not be allowed on lands outside of Midpen's control unless those lands have a legally enforceable mechanism that ensures they shall be protected and managed in perpetuity for the benefit of the target species (i.e., special-status plant requiring mitigation). Midpen shall hold responsibility for the success of mitigation projects conducted on lands outside of its control, unless mitigation is accomplished through an approved program (i.e., mitigation bank or in-lieu fee program).

Midpen shall apply the monitoring methods outlined in the Monitoring Plan of the Program to monitor the success of compensatory mitigation projects. To account for natural variability in the size of plant populations, Midpen shall also monitor a nearby reference population. Midpen shall prepare annual monitoring reports that document the monitoring methods and results. Monitoring reports shall be submitted to CDFW. Monitoring of compensatory planting shall be conducted for at least 5 years. If after 3 years, monitoring has determined that the planting success standards are met, the report shall make this determination and monitoring may cease. Monitoring of

MM Biology-3: Compensatory Mitigation for Impacts to Special-Status Plants

compensatory habitat enhancement shall be conducted for at least 1 year, after which time if the success standards are met, no further monitoring is required.

A mitigation project shall be considered successful if during the monitoring period, the qualified botanist or biological monitor working under a qualified biologist, determines the success threshold has been achieved. The success threshold may be adjusted downward commensurate with any decline observed at the reference population. For example, if a special-status species is detected in a planned work area, and Midpen is unable to reconfigure the treatment or treatment method to avoid impacts to the species, Midpen shall count the number of plants in the work area and at a nearby reference population. The compensation requirement shall be based on the number of plants impacted by the treatment, whereas the number of plants at the reference site shall serve as the baseline for evaluating natural fluctuations in the population. For example, if 100 plants of a given special-status species are located in the work area, the compensation requirement is 300 plants. However, if during the final 2 years of mitigation monitoring the reference population has 20 percent less plants than the baseline value, the threshold for success at the mitigation site shall also be 20 percent less (240 plants, assuming the success threshold was set to 300 plants).

To facilitate the likelihood of success, Midpen shall:

- Ensure materials used for plant establishment (e.g., seed sources, container plantings) are sourced from genetically appropriate material and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible. Container plants shall only be sourced from a nursery that complies with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible.
- Maintain less than 10 percent cover of invasive plants at the mitigation site until the target species has successfully established. Thereafter, Midpen shall conduct invasive plant removal on an as-needed basis.
- Implement measures (e.g., close restoration areas, install signage) to restrict public access within mitigation zones, at least until the target species has successfully established.
- Conduct visual inspections of the mitigation site to identify any major problems (e.g., unauthorized trespass) requiring remedial actions. The frequency of visual inspections shall be commensurate with threats to the ecological integrity of the site. The site shall be inspected annually until the success criteria of the permitting agencies (e.g., CDFW) are met, after which the site shall be monitored in accordance with Midpen's Monitoring Plan for the WFRP.

Applicable Location(s): Any area where Program activities permanently affect any special-status plant population.

Performance Standards and Timing:

- **Before Activity:** Determine appropriate compensation ratio.
- **During Activity:** Select habitat preservation, creation, restoration, or enhancement for compensatory mitigation project.
- **After Activity:** Monitor the success of compensatory mitigation projects for no less than 5 years.

MM Biology-4: Invasive Plants and Soil Pathogens

General Invasive Plant Measures

In addition to Midpen's standard invasive species practices under the IPMP (i.e., IPMP BMPs 11 through 18), Midpen shall implement the following invasive plant measures:

- Data on populations of invasive weed species in the work area and along access roads shall be collected and reviewed prior to implementation of the Program activity. Data shall include the distribution, abundance, and seral stage of invasive weed species. Pre-activity general surveys conducted according to MM Biology-1 shall

MM Biology-4: Invasive Plants and Soil Pathogens

be designed to detect all weeds on the CDFA noxious weed list, and Cal-IPC species with a rank of High and Moderate.

- Invasive weed species that occur within or immediately adjacent to the boundaries of proposed treatment areas shall be removed prior to the treatment—unless the treatment has been specifically designed to control or eliminate those species. For example, yellow starthistle removal shall not be required for a grazing treatment designed to control yellow starthistle. Midpen shall identify the appropriate disposal location for weeds that are removed. In determining the disposal location, Midpen shall assess the potential for spread of plant pathogens that might be present.
- Schedule activities to maximize the effectiveness of control efforts and minimize introduction and spread of invasive plants (e.g., install and maintain fuelbreaks, disclines, and other VMAs before non-native plants set seeds).
- Implement vegetation methods favorable to native plants.

Prescribed Fire and Planning Invasive Plant Measures

- A qualified biologist/botanist or biological monitor working under a qualified biologist shall evaluate the likely effects of a prescribed burn on invasive species in the proposed burn area based on the species that are known to occur in the area or that are found during the pre-activity survey (MM Biology-1). If the burn might promote spread of an invasive species, Midpen shall implement measures (e.g., manual treatments) to proactively reduce the threat or invasive species spread following the burn.
- A qualified biologist/botanist or biological monitor working under a qualified biologist shall assess the effects of the burn to determine whether revegetation is needed in any areas to speed recovery of the desired plant community.
- A qualified biologist/botanist or biological monitor working under a qualified biologist shall monitor vegetation recruitment on control lines. If vegetation recruitment is not on a trajectory for restoration of the impacted community, Midpen shall implement remedial measures such as planting or seeding.
- An interdisciplinary team shall determine when activities (including conservation grazing and public access) may resume in burned areas. The team shall include natural resource staff knowledgeable about invasive plants.

General SOD and Soil *Phytopthoras* Measures

Midpen shall implement the latest BMPs recommended by the California Oak Mortality Task Force (2020) and the Phytophthoras in Native Plant Habitats Work Group, as determined appropriate by the qualified biologist/botanist or biological monitor working under a qualified biologist.

Applicable Location(s): All Midpen lands.

Performance Standards and Timing:

- **Before Activity:** (1) Collect data on populations of invasive weed species in the work area and along access roads and, (2) evaluate the likely effects of a prescribed burn on invasive species in the proposed burn area.
- **During Activity:** (1) Remove invasive weed species that occur within or immediately adjacent to the boundaries of proposed treatment areas, (2) clean vehicles, equipment, and boots prior to entering the work area, (3) assess the effects of a prescribed burn to determine whether revegetation is needed in any areas to speed recovery of the desired plant community, (4) if a prescribed burn might promote spread of an invasive species, implement measures to proactively reduce the threat that the plant shall spread following the burn, and (5) implement the BMPs recommended by the California Oak Mortality Task Force and the Phytophthoras in Native Plant Habitats Work Group.
- **After Activity:** Monitor vegetation recruitment on disturbance lines for adequate restoration of the impacted community, if applicable.

MM Biology-5: Invasive Plant Detection and Response

Early Detection and Rapid Response

Midpen shall conduct routine monitoring of work areas (e.g., VMAs, prescribed burn areas) in accordance with the Early Detection Rapid Response (EDRR) Protocol and the IPMP (generally every 3 to 5 years). If invasive or potentially invasive species are detected, Midpen shall conduct rapid response dependent upon the circumstances and according to the EDRR Protocol.

Baseline Data and Reference Sites

A Midpen-approved biologist/botanist shall select a reference site for each sensitive natural community affected by the Program. The reference site shall be on Midpen lands that are not directly or indirectly affected by Program activities. Prior to Program impacts in an area, an initial assessment shall be conducted to select a reference site that possess characteristics similar to the impact sites. If a suitable reference site does not exist and when feasible, Midpen shall collect 3 years of vegetation sampling data at the proposed impact site. Quadrat sampling shall occur for up to 5 years at a reference site, if located. This pre-impact or reference site data shall serve as the baseline for comparison with post-impact data.

Sampling shall be conducted within quadrats at both the impacted site and reference sites. Quadrat sizes vary depending upon habitat type and shall be determined by the qualified botanist or biological monitor working under a qualified biologist, but typical sizes are 0.5 to 1 square meter for short grassland, 2 square meters for shrublands, and up to 20 square meters for woodlands. The qualified botanist or biological monitor working under a qualified biologist shall conduct power analysis to estimate the minimum number of quadrats needed to determine a statistically significant difference between the impact site and reference sites (at a significance level of 0.05 and a power level of 0.80). Quadrat sampling locations shall be randomly selected through use of a random number generator in GIS. Within each quadrat, absolute cover of plants shall be visually estimated and recorded for the quadrat as a whole and for each individual plant species using the California Native Plant Society's (CNPS's) method for estimating cover values (CNPS 2020). The CNPS method for estimating cover values uses a "bird's eye view," looking from above and estimating cover for the living plants only. Litter and duff shall not be included in these estimates, and the porosity of the vegetation shall be taken into consideration when estimating percent cover. Percent cover diagrams shall be used to facilitate cover estimates. All invasive species that are incidentally detected during sampling (but outside of the quadrats) shall be documented.

Cover data shall be entered into a spreadsheet for analysis. Total cover, percent cover contributed by natives, total cover contributed by non-natives, and cover contributed by invasive weed species shall be calculated from these data.

Success Criteria

- Eradication of invasive or potentially invasive species with a California Invasive Plant Council high rating or designated as noxious that were not detected during the baseline surveys. The target species is considered eradicated after 5 consecutive years with no observations of the target species.
- Within 5 years of the impact, cover of non-native species is less than or equal to cover of non-native species at the reference sites.

Applicable Location(s): Midpen lands.

Performance Standards and Timing:

- **Before Activity:** Select pre-impact or reference site data to serve as the baseline for comparison with post-impact data.
- **During Activity:** Implement EDRR Protocol.
- **After Activity:** Conduct monitoring according to the EDRR Protocol until success criteria is achieved.

MM Biology-6: San Francisco Garter Snake Protection Measures

- All practicable measures shall be taken to avoid killing or injuring San Francisco garter snake during Program activities. Any project-related, human-caused injuries to San Francisco garter snake shall be immediately reported to CDFW and USFWS.
- Within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known San Francisco garter snake occurrence, Program activities shall be conducted consistent with permit terms and conditions of the current versions of the USFWS Recovery Permit Number: TE225974-2 and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander".
- In suitable habitat where San Francisco garter snake has not been documented:
  a. **Biological Awareness Training.** A biological awareness training shall be provided in accordance with MM Biology-1. A biological monitor shall remain on-site in sensitive areas identified during the pre-survey. If at any time a San Francisco garter snake is observed, work shall stop immediately until a qualified biological monitor is contacted. Biological monitor(s) and/or qualified biologist(s) shall remain on the work area while initial ground disturbing activities are being conducted, after which biological monitor(s) and/or qualified biologists shall be on-call while Program activities are being conducted at these sites.
  b. **Vegetation Removal by Mechanized Equipment**. Mowing in areas of San Francisco garter snake habitat shall be conducted outside the peak San Francisco garter snake activity season as determined by a qualified biologist or biological monitor working under a qualified biologist (work typically occurs late October through mid-March or mid-June to end of August). The qualified biologist or biological monitor working under a qualified biologist shall precede the mowing equipment and inspect vegetation for San Francisco garter snake individuals. The mower head shall be kept at 6 inches above ground. Prior to use of a masticator or other heavy equipment in discrete areas with San Francisco garter snake habitat, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for San Francisco garter snake shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a San Francisco garter snake is observed, all activities shall cease and Midpen shall coordinate with USFWS and CDFW immediately. Prior to the start of work, areas shall be identified by the biological monitor and approved by USFWS and CDFW as acceptable locations to which San Francisco garter snake may be relocated if these species are encountered within a work area. Relocation areas shall be a minimum of 100 feet from the boundary of any work area and shall not include staging areas or roads. No San Francisco garter snake shall be removed from the site or maintained in captivity overnight without prior notification and written approval by the USFWS and CDFW unless the animal is in need of emergency medical assistance. Medical assistance shall be provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. When transporting individual San Francisco garter snake, precautions shall be taken to ensure that the animals are not over-stressed and are maintained in safety. Such measures include: keeping animals in a cool, dark, and safe location (snake bag for San Francisco garter snake), providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, keeping animals isolated to prevent them from harming one another, and ensuring holding tanks or bags are kept clean to prevent the spread of any diseases.
  c. **No Stockpiling of Vegetation.** Viable vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.
  d. For all work occurring within 50 feet of ponds, streams, and wetlands suitable for San Francisco garter snake, visual surveys shall be conducted by walking at least a 50-foot buffer area around the pond in an attempt to locate individual San Francisco garter snake no more than 24 hours prior to conducting work. A trained and permitted professional biologist shall capture, transfer, and release in a safe area any San Francisco garter snake deemed to be in danger of being harmed by Program activities. If an San Francisco garter snake is located during the pre-treatment surveys but escapes capture, the area where the snake

MM Biology-6: San Francisco Garter Snake Protection Measures

was lost shall be marked by flag and a 50-foot (15 meter) radius shall be actively patrolled during the work. If necessary, individual San Francisco garter snake may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the work has been completed. After the pre-treatment survey, an avoidance strategy shall be devised and presented to all individuals involved in Program activities prior to the start of work. The number of San Francisco garter snake encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS, and each individual snake shall be photographed for use in identification.

Applicable Location(s): Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known San Francisco garter snake occurrence.

Performance Standards and Timing:

- **Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1, (2) identify acceptable locations where San Francisco garter snake may be relocated if these species are encountered within a work area, (3) for all work occurring within 50 feet of ponds, streams, and wetlands suitable for San Francisco garter snake, conduct visual surveys by walking at least a 50-foot buffer area around the pond in an attempt to locate individual San Francisco garter snake no more than 24 hours prior to conducting work, and (4) devise an avoidance strategy and present it to all individuals involved in Program activities prior to the start of work.
- **During Activity:** (1) Stop work immediately if at any time a San Francisco garter snake is observed, (2) conduct mowing in areas of San Francisco garter snake habitat outside the peak San Francisco garter snake activity season, (3) conduct a visual survey for San Francisco garter snake after vegetation is cute down to 3 inches by hand tools, (4) continue vegetation removal by mechanized equipment very slowly if no sensitive species are found in the area, and (5) do not stockpile vegetation.
- **After Activity:** N/A

MM Biology-7: California Red-Legged Frog Protection Measures

Handling of California Red-legged Frog

Handling of California red-legged frog will be done by permitted and qualified biologists or biological monitor working under a qualified biologist in an expedient manner with minimal harm to the individuals being handled. Handling of California red-legged frog will be done with wet hands. The hands and arms of all workers handling California red-legged frog will be free of lotions, creams, sunscreen, oils, ointment, insect repellent, or any other material that may harm California red-legged frog. Larval California red-legged frog will not be handled out of the water for longer than 30 seconds unless rewetted and will not be retained for longer than 5 minutes for processing. If captured California red-legged frog exhibit signs of distress (e.g., lack of response to stimuli or erratic behavior), they will be immediately released at the point of capture. All captured California red-legged frog will be released at the point of capture unless that location puts them in imminent danger, in which case they will be placed in a nearby refugium sufficient to protect them. The number of California red-legged frog to be captured is no more than 30 adults per habitat location (defined as the area that specific work is conducted such as a pond site or OSP) per year. In the course of monitoring associated with the activities, if California red-legged frog egg masses are observed in ponds or wetted areas that are going to dry naturally before tadpoles develop (as determined by a qualified biologist or biological monitor working under a qualified biologist), emergency salvage of egg masses by the qualified biologist or biological monitor working under a qualified biologist is permitted to relocate egg masses into deeper waters that will not be affected by the proposed activities. USFWS shall be notified of the emergency salvage per the terms of the recovery permit. Amplexing pairs of California red-legged frog will not be captured, handled, or disturbed. The permittee will disinfect sampling and field gear to minimize the spread of pathogens as follows:

MM Biology-7: California Red-Legged Frog Protection Measures

1. Sampling and field gear will be disinfected after exiting one aquatic habitat and before entering the next aquatic habitat, unless the waters are hydrologically connected to one another.
2. All organic matter will be removed from nets, traps, boots, vehicle tires and all other surfaces that have come into contact with water or potentially contaminated sediments. These items will then be rinsed with clean water before leaving each study site.
3. Boots, nets, traps, hands, etc., will be scrubbed with a bleach solution (0.5 to 1.0 cup per 1.0 gallon of water), Quat-128™ (1:60), or a 3 to 6 percent sodium hypochlorite solution and thoroughly rinsed clean with water between study sites. Equipment will be rinsed clean with water between study sites. Cleaning equipment in the immediate vicinity of aquatic habitats will be avoided (e.g., clean in an area at least 100 feet from aquatic features). Care will be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.
4. Used cleaning materials (liquids, etc.) will be disposed of safely, and if necessary, taken back to the lab for proper disposal. Used disposable gloves will be retained for safe disposal in sealed bags.

California red-legged frog will not be removed from the wild and held in captivity for any reason unless prior written approval is acquired by the appropriate USFWS Office or unless the severity of an injury to the California red-legged frog obviates immediate care. Animals will be transported according to accepted methods, in moist cloth bags or in terrarium with moisture gel or non-cellulose sponge to minimize desiccation.

Protocols for California Red-legged Frog Depending Upon Location of Activity

For activities conducted within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known California red-legged frog occurrence:

- Prior to and within 48 hours of the planned start of Program activities, a focused survey for California red-legged frog using an agency approved protocol will be conducted by a qualified biologist or biological monitor working under a qualified biologist to determine if they are in the area. If California red-legged frog are found, Midpen will coordinate with CDFW and USFWS immediately to determine the correct course of action and Program activities at that location will not commence until after May 30 or authorized by CDFW and USFWS.
- If California red-legged frog are found, biological monitor(s) and/or qualified biologists will be on site while Program activities are being conducted. Midpen will implement the following measures:
  a. **Inspection of Parked Vehicles:** Any vehicle parked on-site for more than 15 minutes will be inspected by the biological monitor or qualified biologist before it is moved to ensure that California red-legged frog has not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist.
  b. **Vegetation Removal by Mechanized Equipment at California Red-legged Frog Sensitive Sites (areas within or adjacent to wetted aquatic sites):** For vegetation removal on berms or other wetted sites with known California red-legged frog observations, vegetation will be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for California red-legged frog will be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a California red-legged frog is observed that is in harm's way, all activities shall cease and Midpen will notify CDFW and USFWS immediately or the California red-legged frog can be relocated by a person permitted by the USFWS and approved by CDFW for this project to handle California red-legged frog.
  c. **Vegetation Disposal:** Vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.
  d. **No Stockpiled Soil:** Soil shall not be stockpiled on the ground unless it is on a paved surface or staging area where there are not burrows. Soils stockpiled for more than a single day near potential habitat should

MM Biology-7: California Red-Legged Frog Protection Measures

be covered or surrounded by exclusion fencing as directed by a qualified biologist to prevent burrowing animals from entering the stockpile.

e. **California Red-legged Frog Exclusion for Sediment Removal with Large Equipment:** California red-legged frog will be excluded from the project site prior to Program activities at sites involving the use of large equipment for sediment removal. USFWS and CDFW-approved exclusion fencing will be installed around the sediment removal site, staging areas, and any areas where fill may be dumped. After installation of the fence barrier, a biological monitor or qualified biologist will inspect the project work area, staging and stockpiling areas daily prior to the commencement of activities. If the biological monitor or qualified biologist determines that sensitive species are not within the work area, equipment or materials may be moved into the project site and Program activities may commence under the observation of the biological monitor.

For activities conducted in ponds:

- **Focused Surveys Prior to Work Activities.** Prior to and within 48 hours of the planned start of Program activities, a focused survey for California red-legged frog using agency approved protocol will be conducted by a qualified biologist or biological monitor working under a qualified biologist to determine if California red-legged frog is in the area. The pond will be sampled by a qualified biologist to ensure that all California red-legged frog from that pond are in the post metamorphic stage and will be minimally affected by draining the pond. If a California red-legged frog is located during the pre-treatment surveys but escapes capture, the area where the frog was lost will be marked by flag and a 50-foot (15 meter) radius will be actively patrolled during the work. If California red-legged frog are found, Midpen will coordinate with CDFW and USFWS immediately to determine the correct course of action and Program activities at that location will not commence until after May 30 or authorized by CDFW and USFWS. After the pre-project survey, an avoidance strategy will be devised and presented to all individuals involved in the pond enhancement prior to starting any activities. The number of California red-legged frog encountered and transferred to safe areas or held in captivity by a permitted and qualified biologist during treatment will be reported to the Sacramento USFWS Office and CDFW.
- **Number of On-Site Biologists.** The minimum number of qualified biological monitors required at each pond site will be determined in advance by either the ranch manager or a permitted biological consultant based on pond size, the amount and complexity of work to be performed, and the equipment to be used. This number of monitors will be approved by USFWS prior to the start of any work.
- **Travel Corridors.** Corridors for travel of vehicles and heavy machinery to the pond site will be established at least 24 hours in advance of the proposed work. Corridors that are not established, marked, and improved roads (paved or unpaved) require special consideration for use by any vehicle. During the use of these off-road corridors by vehicles and machinery, a monitor shall proceed directly before the vehicle or machinery to ensure all California red-legged frog and observable wildlife is cleared from the pathway of the oncoming vehicle. Monitors shall signal vehicles to stop if a California red-legged frog is on the pathway, and shall allow the animal to clear the pathway by its own direction. Any handling of the red-legged frog must only be done by a qualified permitted individual. Measures shall be taken to minimize the number of vehicles allowed on the property. All vehicles involved with the site-specific work that are not transported to the work site will be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor will ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads.
- **Seasonal Work Period in Ponds**. If California red-legged frog are found in the pond and water is present in the pond, sediment removal and berm or outfall repair activities shall be performed from August 15 to November 1. Midpen will coordinate with CDFW and USFWS prior to dredging or de-watering activities. Sediment will be removed from ponds by hand to the extent feasible. Sediment removal from ponds will occur as soon as the ponds are dry (if prior to August 15).
- **Vegetation Removal at Ponds**. If California red-legged frog is found, tule and emergent vegetation will be removed by hand when feasible. If mechanized equipment is used, one or more biological monitors or qualified

MM Biology-7: California Red-Legged Frog Protection Measures

biologists will be onsite monitoring the scoop bucket while scooping and watching each load unload. Midpen will coordinate with CDFW and USFWS during the annual project notification process regarding anticipated mechanized equipment use for vegetation removal at ponds. In areas where egg masses are known, Midpen and contractor personnel will not enter the channel/pond to avoid dislodging egg masses. Trimming activities shall be performed from the banks, if possible.

- **Inspection for Egg Masses**. In work areas containing emergent vegetation (e.g., tules, cattails), vegetation will be inspected for California red-legged frog eggs masses prior to Program activities. If work cannot be postponed, a buffer of vegetation at least 10 feet in diameter shall be left around any egg masses found. Midpen will keep a record of sites where egg masses are found and conduct vegetation removal at these sites prior to November 1 in subsequent years.

If California red-legged frog is not found during the focused survey, or for activities conducted in suitable habitat where California red-legged frog has not been documented:

- The biological monitor shall remain on-site if sensitive areas are identified during the presurvey. A biological awareness training shall be provided to all persons prior to beginning work. If at any time a California red-legged frog is observed, work shall stop immediately until a biological monitor is contacted. Biological monitor(s) and/or qualified biologists shall then remain be on the project site while Program activities are being conducted. If California red-legged frog is observed, the applicable California red-legged frog measures procedures described above will be followed.

General California Red-legged Frog Avoidance Measures

- If California red-legged frog enters the project area, all work shall stop until the animal leaves on its own. If a person is permitted by the USFWS and approved by CDFW for this specific project to handle California red-legged frog, they can handle and relocate California red-legged frog. Midpen will coordinate with CDFW and USFWS to develop site appropriate avoidance measures utilized for relocation. Prior to the start of work, areas will be identified by the biological monitor-in-charge and approved by the USFWS and CDFW as acceptable locations to which California red-legged frog may be relocated if these species are encountered within a work area. Relocation areas will be a minimum of 500 feet from the boundary of any work area and will not include staging areas or roads. No California red-legged frog will be removed from the site or maintained in captivity overnight without prior notification and written approval by the USFWS and CDFW unless the animal is in need of emergency medical assistance. Medical assistance will be provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care. When transporting individual California red-legged frog, safe handling precautions will be taken to ensure that the animals are not over-stressed. Safe handling measures include: keeping animals in a cool, dark, and safe location (terrarium for California red-legged frog), providing adequate hydration, maintaining a stable cool temperature to avoid over-heating, keeping animals isolated to prevent them from harming one another, and ensuring holding tanks or bags are kept clean to prevent the spread of any diseases.
- All practicable measures shall be taken to avoid killing or injuring any life stage of California red-legged frog during habitat enhancement activities.
- The biological monitor and/or qualified biologist shall have the authority to halt work activities that may affect California red-legged frog adults, tadpoles or egg masses until they can be moved out of harm's way.
- Any project-related, human caused injuries to California red-legged frog will be immediately reported to CDFW and USFWS.

Applicable Location(s): Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known California red-legged frog occurrence.

Performance Standards and Timing:

- **Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1, (2) identify acceptable locations where California red-legged frog may be relocated if encountered within a work area, (3)

MM Biology-7: California Red-Legged Frog Protection Measures

conduct a focused survey for California red-legged frog using an agency approved protocol prior to and within 48 hours of the planned start of Program activities, (4) for all work occurring within 50 feet of ponds, streams, and wetlands suitable for California red-legged frog, conduct visual surveys by walking at least a 50-foot buffer area around the pond in an attempt to locate individual California red-legged frog no more than 24 hours prior to conducting work, (5) devise an avoidance strategy and present it to all individuals involved in Program activities prior to the start of work, and (6) inspect vegetation in work areas containing emergent vegetation for California red-legged frog eggs masses prior to Program activities and keep records.

- **During Activity:** (1) Stop work immediately if a California red-legged frog enters the work area, and (2) implement applicable measures for stop work and handling of individuals if California red-legged frog are found.
- **After Activity:** N/A

MM Biology-8: Foothill Yellow-Legged Frog Protection Measures

If foothill yellow-legged frog are found during the general survey conducted per MM Biology-1, biological monitor(s) and/or qualified biologists shall remain in the work area while Program activities are conducted.

For activities conducted within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known foothill yellow-legged frog occurrence (within the last 20 years):

- Information on foothill yellow-legged frog shall be included in the biological awareness training provided in accordance with MM Biology-1.
- Any vehicle parked on-site for more than 15 minutes shall be inspected by the biological monitor or qualified biologist before it is moved to ensure that foothill yellow-legged frog have not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist. Vehicles shall not be moved if a frog is found, until the frog has moved out of harm's way as determined by the biological monitor or qualified biologist.
- For vegetation removal at sites with known foothill yellow-legged frog observations, vegetation shall be cut down to 3 inches by hand tools (weedwhacker, etc.). Once the ground is visible, a visual survey for foothill yellow-legged frog shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a foothill yellow-legged frog is observed, all activities shall cease and Midpen shall notify CDFW immediately. Foothill yellow-legged frog can only be relocated by an individual permitted by CDFW for this Program to handle foothill yellow-legged frog.
- Vegetation that is to be removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on-site for erosion control or slash and not be moved or disturbed.

Applicable Location(s): Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known foothill yellow-legged frog.

Performance Standards and Timing:

- **Before Activity:** Provide a biological awareness training in accordance with MM Biology-1.
- **During Activity:** (1) Stop work immediately if at any time a foothill yellow-legged frog is observed and notify CDFW, (2) conduct a visual survey for foothill yellow-legged frog after vegetation is cute down to 3 inches by hand tools, (3) continue vegetation removal by mowing or mechanized equipment very slowly if no sensitive species are found in the area, (4) do not stockpile vegetation, and (5) check all parking areas and under

vehicles to ensure no presence of foothill yellow-legged frog and if any are found, do not move vehicles until the frog has moved out of harm's way.

- **After Activity:** N/A

MM Biology-9: Western Pond Turtle Protection Measures

Within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known western pond occurrence:

- Information on western pond turtle shall be included in the biological awareness training provided in accordance with MM Biology-1.
- A focused survey for western pond turtle and western pond turtle nests shall be conducted prior to and within 48 hours of the planned start of Program activities by a qualified biologist or biological monitor to determine if any individuals are in the area.
- In the event western pond turtle are found in the work area, Midpen shall exercise measures to avoid direct injury to western pond turtle as well as avoid areas where they are observed to occur.
- If a western pond turtle is observed during the Program activity, it shall be left alone to move out of the area on its own. If it does not move on its own, it can be relocated to a safe location at least 100 feet away from the work area. Relocation areas shall be of suitable habitat, on shallow banks with slow moving water and shall be far enough away so as not to be affected by Program activities.
- If a western pond turtle nest was not found during focused surveys but is observed after initiation of Program activities and its habitat is determined to be unavoidable, all activities shall cease and Midpen shall coordinate with CDFW to develop site-appropriate avoidance and minimization measures.

Applicable Location(s): Where Program activities are proposed within riparian habitat or Waters of the State and/or U.S. and 1 mile of a known western pond turtle occurrence.

Performance Standards and Timing:

- **Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1, and (2) conduct a focused survey for western pond turtle and western pond turtle nests prior to and within 48 hours of the planned start of Program activities.
- **During Activity:** (1) Exercise measures to avoid direct injury to western pond turtle as well as avoid areas where they are observed to occur if western pond turtle are found in the work area, (2) leave western pond turtle alone to move out of the work area on their own if a western pond turtle is observed during activities, (3) relocate western pond turtle at least 100 feet distant from the work area if it does not move on its own, and (4) cease all activities is a western pond turtle nest is found and coordinate with CDFW to develop avoidance and minimization measures.
- **After Activity:** N/A

MM Biology-10: California Giant Salamander, Santa Cruz Black Salamander, and Red-Bellied Newt Protection Measures

In primary suitable habitat where Santa Cruz black salamander, California giant salamander, or red-bellied newt were observed or are known to occur:

- Information on these species shall be included in the biological awareness training provided in accordance with MM Biology-1.
- A qualified biologist and biological monitor shall be available and on-call for the duration of Program activities.
- A biological monitor shall be present on-site when working within 50 feet of wetted areas including stream channels, seeps, and springs.

MM Biology-10: California Giant Salamander, Santa Cruz Black Salamander, and Red-Bellied Newt Protection Measures

- For Santa Cruz black salamander only, a biological monitor is also required in areas of talus slopes or areas having human stacked rocks and other suitable materials acting as talus.
- Work in wetted areas, talus slopes, or human stacked rocks or other suitable materials acting as artificial talus should be completed prior to July to avoid displacement of Santa Cruz black salamander females laying eggs and attending to clutches.
- Dismantling of talus and human-stacked rocks and other suitable materials acting as artificial talus shall be avoided and minimized whenever possible. If removal is required to meet project objectives, these materials shall be dismantled by hand whenever possible.
- Whenever possible, individual Santa Cruz black salamander, California giant salamander, and red-bellied newt shall be allowed to leave the area on their own.
- Individual Santa Cruz black salamander, California giant salamander, or red-bellied newt (not with eggs) that are in harm's way or do not leave the work site on their own may be relocated by a qualified biologist or biological monitor to predetermined sites located outside of the work area but within the same subwatershed.
- If heavy equipment is required to remove talus, human stacked rocks or other suitable materials acting as artificial talus, this shall be done in the presence of a qualified biological monitor.
- If at any time, Santa Cruz black salamander, California giant salamander, or red-bellied newt eggs are found, the area shall be flagged for avoidance. If the area cannot be avoided to meet Program objectives, Midpen shall coordinate with CDFW to determine the best course of action.

In all other areas of suitable habitat for Santa Cruz black salamander, California giant salamander, and red-bellied newt:

- Information on these species shall be included in the biological awareness training provided in accordance with MM Biology-1.
- A qualified biologist and biological monitor shall be on-call with suitable availability to respond to calls for the duration of Program activities.
- A pre-survey of the work area is required prior to starting work. If no Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed, work may proceed.
- If an individual Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed at any time, all activities shall stop and the biologist and/or biological monitor shall be notified and the above measures shall be implemented.

Applicable Location(s): Where Program activities are proposed within suitable habitat for Santa Cruz black salamander, California giant salamander, or red-bellied newt.

Performance Standards and Timing:

- **Before Activity:** (1) Provide a biological awareness training in accordance with MM Biology-1 and (2) conduct a pre-survey of the work area.
- **During Activity:** (1) Ensure biological monitors are present on-site where applicable and (2) stop all activities, implement appropriate measures, and notify the biologist and/or biological monitor if an individual Santa Cruz black salamander, California giant salamander, or red-bellied newt are observed at any time.
- **After Activity:** N/A

MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet)

- Implement IPMP BMP 22 with the additional provisions listed here.

MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet)

- To avoid potential impacts to nesting birds, all Program activities shall be conducted between September 1 to February 14 unless a preconstruction nesting bird survey has been conducted by a qualified biologist or biological monitor. Work should be done during the non-breeding season whenever possible. The bird nesting seasons for smaller birds and raptors are defined per IPMP BMP 22 as follows:
  - March 15 to August 30 for smaller bird species such as passerines; and
  - February 15 to August 30 for raptors.
  - Earlier surveys may be needed for specific species such as owls, hummingbirds, herons and egrets and/or other species if nesting activity shifts due to climate change, as determined by a qualified biologist or biological monitor working under a qualified biologist.
- If Program activities are scheduled during the nesting season of raptors and/or migratory birds, a focused survey for active nests of such birds shall be conducted by the qualified biologist or biological monitor within 15 days prior to the beginning of project-related activities. Surveys shall be conducted in all suitable habitat located at work areas and in staging and storage areas. The minimum survey radius for each bird type surrounding the work area shall be the following:
  - 250 feet for passerines;
  - 500 feet for other small raptors such as accipiters;
  - 1,000 feet for larger raptors such as buteos and eagles.
  - The bird survey methodology and the results of the survey shall be submitted to the CDFW prior to commencement of Program activities.
- If an active nest (i.e., a nest having eggs or chicks present, or a nest that adult birds have staked a territory and are displaying, constructing a nest, or are repairing an old nest) is found and work cannot be postponed, Midpen shall designate active nest sites as "Ecologically Sensitive Areas" and protected (while occupied) during Program activities with the establishment of flagging or a fence barrier surrounding the nest site. No trees or shrubs that contain active bird nests shall be disturbed until all eggs have hatched, and young have fully fledged (are no longer being fed by the adults, and have completely left the nest site). No habitat removal or modification shall occur within the Ecologically Sensitive Area fenced nest zone even if the nest continues to be active beyond the typical nesting season for the species, until the young have fully fledged and shall no longer be adversely affected by the Program. The minimum distances of the protective buffers surrounding each identified nest site shall be the following per IPMP BMP 22, with some considerations depending on nest location and substrate:
  - 500 feet for large raptors such as buteos;
  - 250 feet for small raptors such as accipiters;
  - 250 feet for passerines; and
  - 1,000 feet for eagles.
- A biological monitor or qualified biologist shall monitor the behavior of the birds (adults and young, when present) at the nest site to ensure that they are not disturbed by Program-related activities. Nest monitoring shall continue during Program-related construction work until the young have fully fledged, are no longer being fed by the parents and have left the nest site and surrounding area, as determined by a biological monitor. If a protective buffer must be modified, Midpen shall coordinate with the CDFW and/or the USFWS as appropriate prior to resumption of Program activities.
- If a lapse in Program-related work of 15 days or longer occurs, another focused survey shall be conducted before Program activities are reinitiated.

Applicable Location(s): Where Program activities are scheduled during the nesting season of raptors and/or migratory birds.

MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet)

Performance Standards and Timing:

- **Before Activity:** (1) Conduct a focused survey for active nests of raptors and/or migratory birds within 15 days prior to the beginning of Program activities and submit results to CDFW, and (2) if active nests are found, designate active nest sites as "Ecologically Sensitive Areas" and comply with provisions specified.
- **During Activity:** (1) Complete work during the non-breeding season whenever possible, (2) conduct nest monitoring during Program activities, and (3) retain individual dead or dying trees to the maximum extent practicable.
- **After Activity:** N/A

MM Biology-12: Marbled Murrelet Nest Protection Measures

a. Implement IPMP BMP 22 with the additional provisions listed here.

b. In areas within the range of marbled murrelet habitat as identified in the Midpen 2007 maps, Midpen shall conduct a survey of habitats within 0.25-mile of the work area for trees that meet the Pacific Seabird Group definition of potential marbled murrelet nesting trees. If such trees are present within 300 feet of the work area or if a marbled murrelet nest is detected, Midpen shall coordinate with CDFW and USFWS before proceeding. If habitat trees are present within 0.25-mile of the work area but are greater than 300 feet from the work area, Midpen shall implement the following conditions:

c. Work within the work area shall be confined to the period of September 15 to November 1 when possible.

d. If activities cannot be conducted outside the breeding season, and must occur during the marbled murrelet breeding season (March 24 to September 15) Midpen shall:

   i. Coordinate with CDFW and USFWS.

   ii. Implement seasonal disturbance minimization buffers as listed in the table below and in the July 26, 2006 document, Estimation of the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California (table below).

Existing Pre-Program (Ambient) Sound Level[a]	Anticipated Action Generated Sound Level[b]			
	Moderate (71-80 dB)	High (81-90 dB)	Very High (91-100 dB)	Extreme (101-110 dB)
Natural Ambient (<=50 dB)[c]	165 feet	500 feet	1,320 feet	1,320 feet
Very Low (51-60 dB)	40 feet	330 feet	825 feet	1,320 feet
Low (61-70 dB)	40 feet	165 feet	825 feet	1,320 feet
Moderate (71-80 dB)	40 feet	165 feet	330 feet	1,320 feet
High (81-90 dB)	40 feet	165 feet	165 feet	500 feet

Notes:

MM Biology-12: Marbled Murrelet Nest Protection Measures

[a] Existing (ambient) sound level includes all natural and human-induced sounds occurring at the work area prior to the proposed action, and are not causally related to the proposed action.

[b] Action-generated sound levels are given in decibels (dB) experienced by a receiver, when measured at 15.2 m from the sound source.

[c] "Natural Ambient" refers to sound levels generally experienced in habitats not substantially influenced by human activities.

iii. Conduct a sound level monitoring study to determine the level of ambient and construction activity noise anticipated during construction activities to calculate seasonal disturbance minimization buffer widths. Midpen shall provide a description of methods and results of the study to USFWS and CDFW to coordinate site-specific avoidance measures 30 days prior to commencement of Program activities at the applicable location(s). In order to alert work crews to their presence, marbled murrelet seasonal disturbance buffers, as determined by the sound study and table above, shall be flagged in the field where they enter the work area. If Midpen chooses not to conduct the sound study, no Program activities shall occur within 0.25-mile of potential nest trees during the marbled murrelet breeding season (March 24 to September 15).

iv. If noise generating construction activity takes place during the breeding season (March 24 to September 15) within suitable Redwood and Redwood/Douglas-fir forests, construction activities shall be restricted to 2 hours after sunrise to 2 hours before sunset to minimize disturbance of potential nesting marbled murrelet using forest habitat as a travel corridor between inland nesting and coastal habitat.

v. Midpen or its contractor shall not conduct Program activities within a visual line-of-sight distance of 40 meters or less from a suitable nest tree as designated by a qualified biologist or biological monitor.

e. If marbled murrelet protocol level surveys are conducted and do not indicate that the habitat is occupied by marbled murrelet, the seasonal and distance work restrictions may be lifted with approval from CDFW and USFWS. Protocol level survey procedures and information can be found at: http://www.pacificseabirdgroup.org/publications/PSG_TechPub2_MAMU_ISP.pdf. If Midpen chooses to conduct marbled murrelet protocol level surveys, Midpen shall coordinate with CDFW and USFWS regarding the survey stations to ensure all contiguous suitable habitat is covered and good visuals of the sky and nearby flyways, if present, are provided. If marbled murrelet protocol level surveys are conducted, Midpen shall submit the report consistent with *Methods for Surveying Marbled Murrelets in Forests: A Revised Protocol for Land Management and Research*.

Applicable Location(s): Where Program activities are proposed within the range of marbled murrelet habitat.

Performance Standards and Timing:

- **Before Activity:** (1) Conduct a survey of habitats within 0.25-mile of the work area for trees that meet the Pacific Seabird Group definition of potential marbled murrelet nesting trees, and (2) implement appropriate measures based on survey results.
- **During Activity:** If activity occurs during the nesting season, conduct a sound level monitoring study, provide results to USFWS and CDFW, and comply with applicable measures based on survey results.
- **After Activity:** N/A

MM Biology-13: Special-Status Insect Host Plant Protection

- Prior to conducting treatments in suitable habitat for special-status butterfly and moth species, surveys shall be conducted for the following host plant species during the appropriate blooming period:

MM Biology-13: Special-Status Insect Host Plant Protection

- Bay checkerspot butterfly: dwarf plantain (*Plantago erecta*), purple owl's clover (*Castilleja densiflora*), and exserted paintbrush (*Castilleja exserta*).
- Smith's blue butterfly: coast buckwheat (*Eriogonum latifolium*) and seacliff buckwheat (*Eriogonum parvifolium*)
- Monarch butterfly: all milkweeds (*Asclepias* sp.)
- Unsilvered fritillary butterfly: violets (*Viola* sp.)
- Opler's longhorn moth: California cream cups (*Platystemon californicus*)
- Callippe silverspot butterfly (not known to be present but the host plant has potential to be present): Johnny Jump up (*Viola pedunculata*)

- Host plants containing eggs, larvae, or pupae of special-status butterfly or moth species shall be avoided, and shall be protected with an appropriately-sized buffer as determined by a qualified biologist, taking into account the characteristics of the plant species and the nature of the proposed treatment.
- Vegetation treatment may proceed if a qualified biologist determines that the host plants (1) are not occupied by special-status butterflies or moths, and (2) may benefit from treatment (such as if the host plants have already set seed and post-treatment conditions will favor them over non-native weed species).

Applicable Location(s): Where Program activities are proposed within suitable habitat for special-status butterfly and moth host plants.

Performance Standards and Timing:

- **Before Activity:** (1) Conduct survey for special-status butterfly and moth host plants during the appropriate blooming period, and (2) implement appropriate measures based on survey results.
- **During Activity:** Avoid host plants containing eggs, larvae, or pupae of special-status butterfly or moth species and protect with appropriate buffer.
- **After Activity**: N/A

MM Biology-14: Salmonid Protection Measures

- Vegetative debris shall not be stockpiled in areas where it could enter a stream, wetland or riparian area.
- Corrective actions, such as repairs to erosion control BMPs necessary to preserve water quality and revegetation activities, are allowable year-round.
- **Seasonal Work Period in Salmonid Critical Habitat:** Program activities within streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon shall be limited to June 15 to October 31.
- **Seasonal Work Period in Aquatic Habitats Outside of Critical Habitat.** Program activities within streams and associated riparian corridors that are not designated Critical Habitat for salmonids shall be limited to April 15 to October 31, or are permissible from November 1 to April 14 under the following conditions:
  a. Work shall not occur until the site has received no rainfall for a period of 10 days and there is no rain in the forecast for a period of 7 or more days, and work requires no greater than 5 days to complete.
  b. Work started during this period must be at least 50 percent complete within 2.5 days of beginning work.
  c. Winterization materials must be on hand and installed if unanticipated rainfall begins (defined as 0.5 inches of rain in a 24-hour period).

Applicable Location(s): Where Program activities are proposed within or adjacent to streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon.

Performance Standards and Timing:

- **Before Activity:** Implement and maintain corrective actions to preserve water quality.
- **During Activity:** (1) Do not stockpile vegetative debris where it could enter a stream, wetland, or riparian area, (2) work within streams and associated riparian corridors that are designated Critical Habitat for steelhead and Coho salmon limited to June 15 to October 31, and (3) work within streams and associated riparian corridors that are not designated Critical Habitat for steelhead and Coho salmon limited to April 15 to October 31 or permissible under additional conditions.
- **After Activity:** N/A

MM Biology-15: Monarch Butterfly Overwintering Aggregation Protection

Prior to any Program activities in tree groves comprised primarily or entirely of pine, cypress, fir, or eucalyptus that are within 2 miles of the Pacific Coast, a qualified biologist or biological monitor working under a qualified biologist shall survey the grove for aggregations of monarch butterflies during the overwintering season according to the Xerces Society's Western Monarch Count Protocol (Xerces Society 2019), available at https://www.westernmonarchcount.org:

Two surveys shall be conducted during the overwintering season, one during the Western Monarch Thanksgiving Count period (the three-week period centered on the Thanksgiving holiday), and a second during the New Year's Count period (the two-week period beginning the weekend prior to New Year's Day).

- Each survey shall be conducted by two surveyors to provide multiple independent estimates of monarch numbers.
- Surveys shall be conducted in the morning while temperatures are below 55˚ F (13˚ C) and monarchs are more likely to be clustered.
- Surveys shall not be conducted during rain or strong winds due to poor visibility and the chance that individual monarchs shall be scattered on the ground.
- If no monarch overwintering aggregations are observed, Program activities may proceed pursuant as long as they occur prior to November 1. If Program activities are delayed beyond November 1, then the grove shall be re-surveyed.
- If a monarch overwintering aggregation of any size is detected, then no Program activities may take place inside the tree canopy within 200 feet of the aggregation, when present. Activities outside of the canopy line but within 200 feet may proceed (i.e., treatment of low-growing vegetation outside of the tree grove) if a qualified biologist or monitor determines that the activity does not pose a threat to the monarch aggregation.
- Once the aggregation disperses (typically by March), treatment of vegetation within 200 feet of tree(s) where monarch aggregations were observed may proceed if, as determined by a qualified biologist or monitor, it shall not result in significant alteration to wind and sunlight patterns within the grove.
- If monarch overwintering aggregations are detected in eucalyptus removal areas, then a long-term tree planting strategy is necessary (see *Protecting California's Butterfly Groves* [Xerces Society 2017]).
- Native tree species suitable for monarchs must be planted many years prior to eucalyptus removal with the understanding that they may not reach functional heights to provide wind protection and suitable dappled lighting for 15-30 years. Transplanting saplings from a local source may speed this process. Planting of eucalyptus shall be prohibited. Removal of eucalyptus may proceed once native replacement trees have reached sufficient size to provide wind protection within the grove.
- Standing dead trees generally do not contribute to monarch overwintering habitat (Xerces Society 2017) and may be removed within the grove between April 1 and August 31, outside of the overwintering period, as determined appropriate by a qualified biologist or monitor. Sites where invasive dead trees have been removed may create opportunities for native tree planting within the interior of the grove.

MM Biology-15: Monarch Butterfly Overwintering Aggregation Protection

- If a eucalyptus grove where a monarch overwintering aggregation was previously detected is re-surveyed using the Western Monarch Count Protocol (Xerces Society 2019) and found to be unoccupied for 5 consecutive years, then the grove may be removed before native replacement trees have reached full size.

Applicable Location(s): Where Program activities are proposed in tree groves comprised primarily or entirely of pine, cypress, fir, or eucalyptus that are within 2 miles of the Pacific Coast.

Performance Standards and Timing:

- **Before Activity**: (1) Survey tree groves for aggregations of monarch butterflies during the overwintering season according to the Xerces Society's Western Monarch Count Protocol and implement appropriate measures based on survey results, and (2) develop a long-term tree planting strategy if monarch overwintering aggregations are detected in eucalyptus removal areas.
- **During Activity:** Implement tree planting strategy.
- **After Activity:** N/A

MM Biology-16: Prescribed Burns and Biological Resource Avoidance

- All participants in the burn shall be briefed by a Resource Advisor on the special-status species potentially present, where they would likely be found, and who to contact if one is sighted. Resource Advisors shall (1) work with the ignition teams, (2) be a part of any ignition sequence planning, and (3) be in radio contact with either the Ignition Specialist or the Incident Commander directly to ensure quick communication and decision-making regarding the safety of sensitive wildlife.
- Prescribed burns shall maintain the following buffers from various sensitive species and wildlife habitats:
  - Active bird nests shall be given species-appropriate buffers matching those outlined in MM Biology-11 and IPMP BMP 22:
    i. 250 feet for passerines
    ii. 500 feet for other small raptors such as accipiters
    iii. 1,000 feet for larger raptors such as buteos and eagles
  - A 10-foot buffer from San Francisco dusky-footed woodrat nests
  - A 20-foot buffer from occupied bat roosting trees
  - A 10-foot buffer from patches of special-status butterfly and moth host plants if prescribed burns occur before the plants have set seed. Patches of host plants that may benefit from fire may be burned if determined appropriate by a qualified biologist or biological monitor working under a qualified biologist.
- The listed buffer areas may be managed using other vegetation management techniques following each burn (e.g., cattle grazing), but are to remain completely undisturbed during prescribed fire events. Every reasonable attempt shall be made to maintain 0.25 to 0.5 acre (0.1 to 0.2 hectare) of unburned habitat for every 10 acres (4 hectares) of burned habitat (e.g., 4 to 8 acres of retreat habitat are needed for a 160-acre burn, and 9 to 18 acres are needed for a 350-acre burn). Retreat areas shall be conserved randomly throughout the treatment area, especially in areas with known populations of San Francisco garter snake and California red-legged frog. These retreat areas may be naturally occurring areas such as rock formations, ponds and other wetland/riparian areas, areas with a high density of burrows, and other areas not prone to burn, or these areas may be created and maintained using hand tools or water to create fire-breaks or wet-lines.
- No more than 24 hours prior to conducting prescribed fires, visual surveys shall be conducted by walking transects throughout the proposed burn area in an attempt to locate individual special-status reptile and amphibian species, including San Francisco garter snake, California red-legged frog, foothill yellow-legged frog, California tiger salamander, western pond turtle, Blainville's horned lizard, California giant salamander,

MM Biology-16: Prescribed Burns and Biological Resource Avoidance

Santa Cruz black salamander, and red-bellied newt. With permission from CDFW and/or USFWS, a permitted biologist or biological monitor shall capture, transfer, and release in a safe area any special-status reptiles or amphibians deemed to be in danger of being harmed by the prescribed fire activities. If individuals are located during the pre-treatment surveys but escape capture, an area approximately 50 feet (15 meters) in diameter around the individual shall be protected from the burn. If necessary, individuals may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the burn has been completed. The numbers of special-status reptiles and amphibians encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS and CDFW. If San Francisco garter snakes are captured, each individual shall be photographed for use in identification.

- All vehicles involved with the site-specific burn shall be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor shall ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads, and if it is necessary for a vehicle to travel off the designated main road, a monitor shall precede the vehicle to clear wildlife from the pathway of the vehicle. Only biological monitors specifically authorized by the USFWS and CDFW to handle San Francisco garter snake or California red-legged frog (normally these shall be individuals holding a federal recovery permit for the species) shall be allowed to handle, transport, and relocate individuals of these species.
- Below ground temperature monitoring shall be conducted during the burn to monitor air temperatures in a representative subset of suitable San Francisco garter snake refugia. One or more biologists or biological monitors shall place ground temperature monitoring devices (e.g., "hobo thermocouples" in rodent burrows throughout the burn area to monitor changes in temperature in the burrows as fire moves across the landscape. The knowledge gained shall be useful in determining how to conduct future prescribed fires in San Francisco garter snake habitat in a manner that shall minimize potential effects to the species.
- Immediately following each prescribed fire, the permittee shall search the affected post-treatment area to identify dead or injured individuals of all vertebrate taxa. Dead individuals of special-status species shall be collected and deposited at an approved repository. Injured individuals shall be handled only by a permittee authorized to capture and handle the species. Midpen shall ensure medical assistance is provided to injured animals by a certified wildlife veterinarian familiar with amphibian and reptile care.
- Prescribed fire shall not be employed in tidal marsh habitats.
- If an emergency situation necessitates the use of water from a pond occupied by California red-legged frog, a striker pump and intake hose may be used to draw water from one of the small wetland ponds in the burn area to fill engines or back pumps. The intake hose shall be screened with 0.25-inch mesh to prevent intake of California red-legged frogs. The burn plan details the use of lake and ocean water to fill helicopter buckets to aid suppression efforts. If a helicopter bucket is used, it shall draft from the center of the pond, to prevent uptake of California red-legged frogs that may potentially be present.
- Within San Francisco garter snake habitat, post-burn monitoring shall be conducted as part of the Program activity and shall include (1) vegetative response to the burn, (2) wildlife response to the burn, and (3) fire behavior and burn conditions. Because the burn is intended to enhance San Francisco garter snake habitat, the monitoring emphasis for vegetation and wildlife shall be on the wildlife and habitat features that are considered to be necessary to support San Francisco garter snakes. The variables measured for San Francisco garter snake response to habitat are pre- and post-burn data on the (1) vegetation community in the burn area in order to determine vegetative response to the burn and (2) the frequency of valley pocket gopher (*Thomomys bottae*) burrows and other burrows. As part of its standard post-fire evaluation, CAL FIRE and/or Midpen shall provide an analysis of the burn, including how the fire responded to weather and other burn conditions, and percent coverage of the burn within the boundaries of the burn unit.
- Beginning immediately after the burn, the frequency (number) of rodent burrows shall be measured during the vegetation transect monitoring. Vegetation monitoring shall include the establishment of four transects within and three transects outside of the burn area for comparative analysis. Transects shall be randomly established

MM Biology-16: Prescribed Burns and Biological Resource Avoidance

in burned and unburned areas and each transect shall measure 50 meters in length. A meter-square plot shall be established at 5-meter intervals along the transects. Vegetative composition and percent cover for all plant species shall be recorded for each plot. Transect sampling shall take place prior to the burn and at least once per year after the burn for 3 years. Response of native and non-native grasses and coyote brush to the burn shall be of particular interest. Data collected before, during, and after the burn, and the observations made during the evaluation of the burn shall be compiled into a report within 1 year following the burn. Upon completion, the report shall be submitted to USFWS.

Applicable Location(s): All prescribed burns.

Performance Standards and Timing:

- **Before Activity**: (1) Brief all participants on special-status species present in the burn area, and (2) conduct visual surveys by walking transects throughout the proposed burn area no more than 24 hours prior to conducting a prescribed fire and implement applicable measures based on survey results.
- **During Activity:** (1) Maintain appropriate buffers from sensitive wildlife habitats, (2) retain all vehicles in the prearranged, marked parking area and roads, and (3) conduct below ground temperature monitoring during the burn.
- **After Activity**: (1) Search the affected post-treatment area immediately following each prescribed fire, (2) conduct post-burn monitoring within San Francisco garter snake habitat, and (3) measure the number of rodent burrows during the vegetation transect monitoring immediately after the burn and submit all data to USFWS.

MM Biology-17: Sensitive Natural Communities

- Before a Program activity is implemented, a Midpen approved botanist shall: (1) assess the site- and Program-specific threats to each sensitive natural community that might be impacted by the Program activity; and (2) recommend spatial buffers or other management actions that shall reduce potentially significant impacts on the sensitive natural community to less than significant levels. The botanist's recommendations shall be site-specific, and shall consider the specific Program activity being proposed, the resiliency of the community, and its susceptibility to potentially significant impacts associated with the Program activity. Midpen shall implement the botanist's recommendations, to the extent feasible. If Midpen is unable to implement the botanist's recommendations, or if there is uncertainty regarding the effects of a Program activity on the community, Midpen shall monitor the treatment areas after treatment at an interval determined appropriate by the qualified biologist or biological monitor working under a qualified biologist. If the monitoring indicates the Program activity has negatively impacted the community by resulting in substantial loss or degradation of the community, the terms of MM Biology-18 shall apply.
- To the extent feasible, VMAs, fire management logistics areas, and firefighting infrastructure improvements shall be configured to minimize habitat fragmentation, especially in areas with unique structural components or habitat elements and frequency of treatment shall be carefully defined to reduce or minimize the likelihood of type conversion. If conversion is occurring, conditions of MM Biology-18 for compensatory mitigation shall be applied.
- All vegetation removal within tidal marsh or in uplands within 50 feet of tidal marsh shall be conducted with hand tools only. No heavy equipment is permitted.
- Vegetative debris (e.g., slash, chips) shall not be placed on top of vegetation in sensitive communities, unless prescribed in the VMP or PFP and determined by a qualified biologist or biological monitor working under a qualified biologist to not have negatively affect the community.
- Personnel shall not walk through wetlands or other vegetation communities susceptible to trampling.

MM Biology-17: Sensitive Natural Communities

- Prior to approving an off-road travel route, Midpen shall survey the route to ensure avoidance of sensitive biological resources, including special-status species and sensitive natural communities (or habitats).
- If it is not feasible to locate staging areas in previously disturbed areas, they shall be located outside of sensitive communities (or habitats) that could suffer long-term impacts due to staging activities. Staging areas shall not be located in riparian or wetland communities, nor in any of the Group 1 sensitive communities identified for avoidance.
- Burn piles shall be placed in areas away from any live vegetation that might be damaged by the burn.
- Grazing shall be carefully managed, should it occur in or near a sensitive natural community, to limit the grazing duration and to ensure that erosion and sedimentation of waterways and riparian areas does not occur (in accordance with MM Geology-1).

Applicable Location(s): Where Program activities are proposed within sensitive natural communities.

Performance Standards and Timing:

- **Before Activity:** (1) Assess site- and Program-specific threats to sensitive natural communities, (2) recommend spatial buffers or management actions to reduce potential impacts on the sensitive natural communities, and (3) survey off-road travel route.
- **During Activity:** Implement sensitive natural communities protection measures.
- **After Activity:** N/A

MM Biology-18: Compensatory Mitigation for Impacts to Sensitive Natural Communities

Midpen shall provide compensatory mitigation for Program impacts to Group 1 and Group 2 communities. The baseline ratio for impacts to Group 1 communities shall be 3:1 (e.g., 3 acres compensation for each acre impacted). The baseline ratio for impacts to Group 2 communities shall be 2:1. Several factors may dictate the need for a higher ratio (Clement et al. 2014, USACE 2015, USFWS 2016, State Water Resources Control Board 2019). They are:

1. **Mitigation Strategy:** The baseline ratio applies to mitigation projects that entail creation or restoration of the impacted community. One half point shall be added to any mitigation project that involves only enhancement of an existing community as recommended by a Midpen-approved biologist (e.g., seed within native species, removal of human-made infrastructure such as fences or hardscape, treatment of invasive species).
2. **Temporal Loss:** The baseline ratio assumes there shall be no temporal loss of the community. Therefore, the baseline ratio only applies to mitigation projects that are completed within a year after impacts occur. If the mitigation project is not initiated within a year after impacts occur, the ratio shall be increased by 0.2 for each year of lag time between the time of impacts, and the start of mitigation. For example, if mitigation for a Group 2 community is not expected to be initiated until two years after the impacts occur, the mitigation ratio shall be 2.2:1.
3. **Uncertainty:** There is inherent uncertainty in whether a mitigation project will fully replace the functions that are lost from the impact site. As a result, the mitigation ratio must be commensurate with the risk that a mitigation project will not achieve the designated goal, which is generally to replace the functions that are lost from the impact site. The baseline ratios account for the uncertainty inherent in all mitigation projects because they shall achieve "no net loss" of sensitive community functions even if some (relatively small) portions of the mitigation site fail to achieve the desired conditions. However, the baseline ratios assume a relatively high probability of success. Due to Midpen's expertise and experience with mitigation projects, Midpen assumes the mitigation project shall succeed if: (a) Midpen has successfully completed comparable mitigation projects, or (b) scientific literature supports the inference that the mitigation project is likely to be successful (e.g., due

MM Biology-18: Compensatory Mitigation for Impacts to Sensitive Natural Communities

to its simplicity). If the proposed mitigation project does not satisfy either criterion, one point shall be added to the baseline ratio (e.g., the ratio for a Group 2 community shall be increased to 3:1).

4. **Distance:** Compensatory mitigation ratios are generally dependent on the distance of the mitigation site from the impact site. To the extent feasible, Midpen shall mitigate on Midpen property, and within the same watershed as the impact site.
5. **Kind:** The baseline ratios assume "in-kind" mitigation (i.e., the mitigation site replaces the same sensitive natural community or wetland type as the one impacted by the Program). In some instances, there may be ecological benefits to "out-of-kind" mitigation. There shall be no increase in the mitigation ratio for mitigation projects that restore, create, or enhance a Group 1 community as compensation for impacts to a Group 2 community. Midpen shall document the scientific justification for all proposed out-of-kind mitigation projects. No out-of-kind mitigation shall be allowed for impacts on wetland or riparian communities unless authorized by the regulatory agency(ies) with jurisdiction over the impacted resource.
6. **Other Impacts:** A mitigation ratio greater than 1:1 may be needed to account for a project's indirect impacts, and for its contribution to cumulative impacts.[10] The baseline ratios account for these impacts.

To determine the appropriate mitigation ratio for a given project (e.g., treatment), Midpen shall apply the factors described above, in the order listed.

Midpen shall maintain a ledger that documents:

1. Impacts on sensitive communities, including type of community impacted, acreage impacted, year(s) impacts occurred, and activity that caused the impact.
2. The mitigation ratio applied to each Program activity, and the rationale for that ratio. The rationale shall include a formula that incorporates the variables outlined above.
3. Any additional mitigation requirements imposed by the regulatory agencies (e.g., in a Streambed Alteration Agreement from CDFW) beyond what is already described above.
4. Mitigation projects, including the mitigation strategy, type, location, acreage, and date completed.

The ledger shall be used to document compliance with the compensatory mitigation requirements. A copy of the ledger shall be made available to the regulatory agencies.

Any plants or seeds needed for a mitigation project shall be derived from sources determined appropriate by the Midpen-approved botanist. Dependent upon the species, plants or seeds shall be sourced from locally-appropriate genetic material and comply with best management measures intended to exclude *Phytophthora* and other plant pathogens to the extent possible.

Performance Standards. Projects designed to mitigate significant impacts to sensitive natural communities shall be considered successful once they achieve the membership rules described in the most current version of the Manual of California Vegetation. A Midpen Approved botanist shall implement the Relevé and Rapid Assessment vegetation sampling techniques (CDFW and CNPS 2019) to monitor sensitive natural community development at mitigation sites until the site achieves the membership rules (e.g., percent relative cover) described in the most current version of the Manual of California Vegetation, after which the site shall be monitored in accordance with Midpen's monitoring program.

Applicable Location(s): Where Program activities permanently affect any Group 1 and Group 2 communities.

[10] Under CEQA, mitigation must be roughly proportional to the level of impacts.

MM Biology-18: Compensatory Mitigation for Impacts to Sensitive Natural Communities

Performance Standards and Timing:

- **Before Activity:** Determine the appropriate mitigation ratio for project (e.g., treatment).
- **During Activity:** Document compliance with the compensatory mitigation requirements and provide ledger to the regulatory agencies.
- **After Activity:** Monitor the site in accordance with Midpen's monitoring program.

MM Biology-19: Wetlands and Other Potentially Jurisdictional Aquatic Resources

Wetlands and other potential jurisdictional waters that may be impacted by the Program shall be formally delineated by a biologist with expertise in wetland science. In addition to conducting the delineation, and in accordance with the recommendations provided by Castelle et al. (1994), the biologist shall assess the following criteria to determine the buffer size needed to protect the jurisdictional resource from indirect impacts: (1) resource functional value, (2) intensity of adjacent land use, (3) buffer characteristics, and (4) specific buffer functions required. The biologist shall document the results of this assessment and the buffer recommendations in a report to Midpen.

Midpen shall not conduct any Program activities that might directly or indirectly impact jurisdictional wetlands and waters unless it possesses permits from the appropriate State and federal regulatory agencies. Midpen shall make every attempt to avoid direct and indirect impacts to wetlands and other jurisdictional waters. If complete avoidance is not possible, a biologist with expertise in wetland science shall document baseline conditions according to the California Rapid Assessment Method (CRAM) prior to any potential impacts. According to the U.S. Army Corps of Engineers (2015):

- CRAM is a standardized, cost-effective tool for assessing the health of wetlands and riparian habitats. The overall goal of CRAM is to provide a rapid, scientifically defensible, and repeatable assessment method that can be used routinely for wetland monitoring and assessment. CRAM consists of assessing aquatic resources with respect to four overarching "attributes," i.e., buffer/landscape context, hydrology, physical structure, and biotic structure. A number of "metrics" address more specific aspects of aquatic resource condition within each of these attributes. Each metric is assigned a numeric score based on either narrative or schematic descriptions of condition or thresholds across continuous values. Metric descriptions are based on characteristics of aquatic resources observed across a range of conditions, such that the highest score for each metric represents the theoretical optimum condition obtainable for the aquatic resource feature being evaluated.
- The baseline CRAM assessment shall be used in two ways: (1) to monitor the effectiveness of the buffer in preventing indirect impacts to the wetland community; and (2) to ensure compensatory mitigation replaces the wetland functions impacted by the Program.

Compensatory mitigation for impacts to wetland and other jurisdictional waters shall be provided in accordance with USACE guidelines, including: (1) *Guidelines for Preparing a Compensatory Mitigation Plan*; (2) *Attachment 12501.6 – SPD Mitigation Ratio Checklist*; (3) *Regional Compensatory Mitigation and Monitoring Guidelines*, and (4) *2501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios* (USACE 2010, 2012, 2015, 2017). If possible, compensatory mitigation for impacts to wetlands and other jurisdictional waters shall restore a comparable aquatic feature within the same watershed as the impact.

Midpen shall adopt performance standards consistent with the USACE's *Uniform Performance Standards for Compensatory Mitigation Requirements* (USACE 2012). Mitigation monitoring shall adhere to the *Regional Compensatory Mitigation and Monitoring Guidelines* (USACE 2015).

Applicable Location(s): Where Program activities are proposed within wetlands and other potential jurisdictional aquatic resources.

MM Biology-19: Wetlands and Other Potentially Jurisdictional Aquatic Resources

Performance Standards and Timing:

- **Before Activity:** (1) Delineate wetlands and other potentially jurisdictional waters, (2) document baseline conditions of the wetland or other jurisdictional waters if complete avoidance is not possible, (3) obtain necessary permits from the appropriate agencies.
- **During Activity:** Avoid impacts on jurisdictional waters.
- **After Activity:** N/A

MM Biology-20: Significant and Heritage Tree Ordinances

Prior to conducting any work that involves tree removal, biologist or other personnel qualified in tree identification shall identify if any County or local protected and heritage tree ordinances are relevant to the area of work. If an ordinance would apply to the area of work, the area of work shall be investigated by the biologist or personnel qualified in tree identification to identify if any trees subject to the ordinance are found in the project area. If a tree subject to the ordinance is in the area of work, the tree shall be clearly marked as a "Leave Tree" so that it is not accidentally damaged or removed during work. If a tree that qualifies as a protected or heritage tree must be removed, the appropriate steps shall be implemented to obtain the appropriate permits for tree removal.

Applicable Location(s): Where tree removal occurs.

Performance Standards and Timing:

- **Before Activity:** (1) Identify County and local protected and heritage tree ordinances, (2) identify trees that are subject to the ordinance, (3) maker trees for avoidance, and (4) obtain necessary permit to remove protected and heritage trees.
- **During Activity:** Avoid impacts on trees that are marked for avoidance.
- **After Activity:** N/A

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4.5 Cultural and Tribal Cultural Resources

4.5.1 Introduction

This section provides an overview of the potential for implementation of the Program to encounter and impact cultural and tribal cultural resources. The lands managed by Midpen in the Program area contain a number of historic and prehistoric resources. These resources contribute to the diverse background of the San Francisco Bay Area and are unique, nonrenewable community assets. Such resources on Midpen lands include, but are not limited to, prehistoric, historic, and multicomponent archeological sites, historic buildings and structures, and historic roads and bridges. Impacts on cultural and tribal cultural resources are addressed in this section, and mitigation is defined where necessary to reduce potential impacts to these resources.

Comments related to cultural and tribal cultural resource impacts were received during the public scoping period. A summary of these comments and the location where they are addressed in the cultural and tribal cultural resource analysis are provided in Table 4.5-1.

Table 4.5-1 Cultural and Tribal Cultural Resources Scoping Comments

Summary of Comment	Location Addressed
Tribal consultation should be conducted pursuant to Senate Bill (SB) 18 and AB 52 requirements.	Section 4.5.3: Regulatory Setting
The California Historical Research Information System (CHRIS) Center should be contacted, an archaeological records search should be conducted, and the Native American Heritage Commission (NAHC) should be contacted for a Sacred Lands File search for adequate cultural resources analysis.	Section 4.5.4 Impact Assessment Methodology Section 4.5.5: Impact Analysis
How impacts to cultural resources can be determined for resources known to be present as well as previously undiscovered cultural resources should be addressed.	Section 4.5.5: Impact Analysis

4.5.2 Existing Environment

Prehistoric and Historic Overview

Prehistory

Native American occupation and use of the San Francisco Bay Area appears to extend from 5,000 to 8,000 years ago and potentially earlier. Literature provides an overview of the regional prehistory and chronological sequences of the Northern Santa Clara Valley/Southern San Francisco Bay region (Moratto, 1984; Elsasser, 1978; Allen, 1999; Jones and Klar, 2007; Milliken et al., 2007; Hylkema, 1991 and 2002). The Program area was an environmentally advantageous area for Native American use and occupation during the prehistoric period, prior to European contact. The areas would have provided a favorable environment during the prehistoric period

with coastal, riparian, and inland resources readily available. Prehistoric use was heavily influenced by the presence of various seasonal creeks, the San Francisco Bay marshlands around the bay margin, the coastal margins, and the foothills and higher elevations. Travel would have been relatively easy between the coast and bay shorelines and interior. The foothills and higher elevations would have provided access to acorns, seeds, game, tool stone, and other resources while San Francisco Bay and its margins, along with the many perennial and seasonal creeks and sloughs, would have been sources of shellfish, fish, waterfowl, and riparian vegetation. The San Mateo coast would have provided ocean resources similar to those of the bay.

The aboriginal inhabitants of the area belonged to a group known as the Costanoan, a name derived from the Spanish word *Costanos* ("coast people" or "coastal dwellers"), who occupied the Central California coast as far east as the Diablo Range. Their territory covered 6,000 to 7,000 square miles extending along the Pacific Coast from south of Monterey Bay north to the San Francisco Peninsula and inland 20 to 45 miles into the Coast Ranges, including the east shore of San Francisco Bay from the Carquinez Straits south. The descendants of the Costanoan in the San Francisco Bay Area now generally prefer to be known as *Ohlone* (Margolin 1978). Numerous descendant individuals and communities exist today and identify themselves in diverse ways.

Midpen lands are within the *Tamyen* (*Tamien*) and *Ramaytush* areas of the historical *Ohlone* lands, with an estimated population of 1,000 to 1,200 individuals in 1770, based on both mission records and archaeological data (Levy 1978, also Milliken et al. 2007). Research by Bay Area ethnohistorian Randall Milliken has attributed a number of the OSPs or surrounding areas to possible *Ohlone* tribelets, as follows:[1]

- Half Moon Bay: *Chiguan*
- Purisima Creek Redwoods: *Cotege*
- Woodside area: *Lamchin*
- Portola Valley area: *Olpen*
- Saratoga Gap: *Partacsi*
- Los Altos area: *Puichon*
- San Gregorio area: *Oljon*

The various OSPs are generally noted for perennial streams and a relatively mixed habitat mosaic favorable for Native American use and occupation.

[1] The locations of many Ohlone tribelets and settlements are inexact because of incomplete historic records.

Historic Era

Overview

The history of Midpen lands can be divided into the Hispanic Period (Spanish Period 1769-1821), the Mexican Period (1822–1848), and the American Period (1848–onward).

Spanish and Mexican Period

The Spanish philosophy of government in northwestern New Spain, including what is now California, was directed at the founding of *presidios* (forts), missions, and *pueblos* (secular towns) on land held by the Crown (1979–1821). Later Mexican policy (1822–1846) stressed individual ownership of the land through the granting of large tracts of land called *ranchos.* This being the case, vast tracts of the mission lands were granted to individual citizens after the secularization of the missions by Mexico in 1834 (Hart, 1987).

Most of the ranchos were granted during the Mexican Period, 18 in San Mateo County and 42 in Santa Clara County (Arbuckle and Rambo 1968; Richards 1973; Beck and Haase 1974; Hart 1987).[2] *El Camino Real* (State Route 82), the most important road during the Hispanic Period, continued to be used into the American Period as it facilitated travel between the missions, pueblos, and presidios linking present-day San Mateo and Santa Clara counties and beyond. During the Spanish Period, cattle ranching for the production of tallow and hides was the major economic pursuit throughout California. Sheep and other livestock were raised in the Bay Area at various Mission outposts in addition to agriculture crops to supply the San Francisco Presidio, Mission Dolores, and Mission Santa Clara prior to the secularization of the missions.

Mission San Francisco de Asis (Dolores), the sixth of 21 missions in California, was formally established on October 9, 1776, after the initial period of Spanish exploration. This mission had the greatest impact on the indigenous population living within the San Francisco Peninsula. The mission established a number of outposts for grazing and grain cultivation on the peninsula to provide for both the mission and the Presidio of San Francisco. *San Pedro y San Pablo* was established in 1785/1786 in present-day Pacifica, near/adjacent to *Pruristac*, a Native American village. The outpost was used to resettle the *neophytes* (Native Americans who converted to Christianity) and to raise livestock and crops. Others followed: San Bruno Ranch (1790), which concentrated on cattle, and the coastside outposts of El Pilar (1809) for livestock, San Gregorio (1810) for sheep, and La Punta (1810) below present-day El Pescadero for cattle. Mission outposts on the San Francisco Bay side consisted of Zanjones Ranch (1800) for crops, the San Mateo Hospice (1793) for crops and sheep, and the San Francisquito Rancho (1800) for sheep (Hendry and Bowman 1940; Stanger 1963; Hoover et al. 1966; Brown 1975; Hart 1987; Hynding

[2] A review of Mexican Period ranchos within the OSPs was not undertaken. None of the Spanish Period grants of land made to individuals included any of the OSPs. In general, individuals and their descendants generally lost their grants, or at least a major portion, to lawyers and bankers during the American Period, when Mexican Period property titles were subject to dispute (Hart 1987; Richards 1973; Arbuckle and Rambo 1968; Beck and Haase 1974).

1982). Native Americans worked or were conscripted into labor in these locations and others throughout the Spanish and Mexican periods. Artifacts dating through this period speak to the changing worlds of descendant communities and individuals.

Spanish explorers in the late 1760s and 1770s were the first Europeans to traverse the Santa Clara Valley. In 1776, Juan Bautista de Anza and Father Pedro Font traveled through the region, and their favorable reports led to the establishment of both *Mission Santa Clara* and the *Pueblo San Jose de Guadalupe* in 1777. The *Pueblo de San Jose* was one of the three towns in Alta California founded to administer and coordinate the missions and presidios of the province of Alta California. *Mission Santa Clara de Asis*, the eighth of the 21 missions in California and one of seven missions located within Ohlone territory, would have been the mission with the greatest impact on the indigenous population living in the northern and portions of the central Santa Clara Valley.

Mission registers indicate that the majority of the Native Americans from the Saratoga Gap area went to Mission Santa Clara, with some sent to *Mission Santa Cruz*, a mission established later in August 1791 in Santa Cruz (Beck and Haase, 1974; James and McMurry, 1933; Hart, 1987; Skowronek and Wizorek, 1997; Milliken, 2006). Three major historical trail routes traverse through Santa Clara County: Ohlone Indians Bay to Ocean; De Anza Party 1776 and Reenactment 1976; and Mission Padres Trail, Santa Clara (Santa Clara County, 2008).

American Period (1848 to Contemporary)

San Mateo County was created in 1856 from the southern part of San Francisco County and enlarged by annexing part of Santa Cruz County in 1868. During the 1850s, Redwood City was the major population center because it had a port on San Francisco Bay to ship lumber cut and milled in the Coast Ranges (Stanger, 1967). The towns on the San Mateo Peninsula "Bay Side" did not significantly develop until the San Francisco & San Jose Railroad was constructed in 1861 to 1864 while "Coastside" remained largely inaccessible and characterized by small, remote rural towns through the 19th century, connected by poor roads to the "Bay Side." The coast was recognized early as an excellent location for dairying, fishing, and farming, but development was slow and did not really accelerate until the arrival of the Ocean Shore Railway Company in 1905, which extended from San Francisco along the coast to Santa Cruz and led to the founding of a number of coastside villages. European immigration and the inception of a prosperous dairy industry followed by the development of large suburban estates associated with the San Francisco elite impacted population growth in San Mateo County until the early 1900s. The 1906 San Francisco earthquake resulted in rapid suburban development facilitated and fueled by both rail and automobile access to other urban areas and leading to the slow demise of the agricultural or rural land-use patterns in the 1920s to 1940s.

Santa Clara County, named after Mission Santa Clara, was one of the original 27 counties of California. San Jose has been a key urban center since its founding as the first pueblo in Alta California in 1777 and has served as the county seat. Most of the institutions for higher education and the citizen elite were located in San Jose or its twin, the city of Santa Clara (Broek, 1932; Hendry and Bowman, 1940; Hoover et al., 1966; Hart, 1987).

The Santa Clara Valley during the later American Period and into the Contemporary Period (ca. 1876–1940s) developed fruit production and processing as a major industry with the Santa Cruz Mountains to the west, developing lumber and subsidiary milling industries that supplied the growing urban areas of the Bay Area and areas to the south with both raw and milled wood products. By 1920, the Santa Clara Valley was a world center for canned and dried fruit and home to over 40 canneries and 30 packing houses, producing about 90 percent of California's canned food. By the 1960s, the county featured 85 canneries, 23 dried-fruit plants, 25 frozen-food plants, and 85 fresh-fruit and vegetable packers. This predominance of fruit production/processing held steady until after World War II, with a slow decrease from the 1940s to the 1960s due diminishing demand, high costs, and urban development (Broek, 1932; Jacobson, 2011; Findlay, 1985).

The Post-World War II period saw the gradual displacement of the agrarian land-use pattern of both counties, driven by transportation networks focused on the automobile, residential housing for commuters working in large urban areas, commercial centers to serve the local population, and the development of research and development and manufacturing associated with the defense and electronics industries. The general interior region of both counties has been named the "Silicon Valley" (Hart, 1987). The San Mateo “Coastside” and adjacent interior Coast Ranges have remained largely rural or semi-rural, with areas of urban occupation and recreation focused around Half Moon Bay and to the north and south along State Highway 1, which follows the former alignment of the Ocean Shore Railway. The Santa Cruz Mountains are rural, with widely spaced residential housing used by commuters to urban areas, some small businesses, and open spaces dedicated generally to recreation.

The continuing urbanization during the mid-20th century and to the present has resulted in the expansion of transportation networks, the completion of flood-control projects along the major rivers and creeks, the subdivision of the former agricultural and grazing lands, and the growth of the existing cities and towns, especially in the Santa Clara Valley and east of the Coast Ranges to the Bayshore area. The population growth of the late 20th century and continuing into the 21st century has encouraged the redevelopment of older housing tracts into new high-density residential complexes as well as business and industrial parks. Remaining open lands are either under development, slated for development, or have been designated open space by many agencies in the urban Bay Area. Development and redevelopment continue to meet the needs of the increasing urban populations and business development. Coastal San Mateo is continuing to develop although with a focus on controlled growth, the development of small commerce, and the preservation and use of open space along the coastline and interior for public recreation.

Cultural Resources

Much of Midpen lands have not been surveyed for cultural resources. Limited data is available on known recorded or identified resources. At least 106 cultural resources have been recorded[3] or identified within Midpen lands or are close to the boundaries (65 historic resources, 35 prehistoric resources, and six multicomponent resources) as listed in Table 4.5-2.[4] The types of historic resources include architecture (building complexes and residences), structures (radio tower and landscape features), archaeological sites, water-conveyance-system components, roads (historic highways and temporary logging roads), and bridges. The prehistoric resources are varied. On Midpen lands, there are 10 buildings/building complexes including the Alma College District, Bear Creek Stables, the Hawthorns Historic Complex, USFS Felton Homesite, and the Saratoga Summit Forest Fire Station. Two complexes, the Filoli Estate and Moffett Naval Air Station, are just outside of OSP boundaries. Two historic mining districts, the Kaiser Permanente Quarry and the Guadalupe Mines and Town, overlap with OSP boundaries.

Historic industrial resources include a salt works (Schilling Arden Salt Company in Ravenswood) and a boatworks/landing site (Cooley Landing in Ravenswood). Roads/highways have been recorded in five OSPs, including State Highway 35, the Saratoga Toll Road, State Highway 9, Bay Road, and three logging roads. The 15 historic archaeological sites include trash scatters and dumps, foundation remnants, logging features, mining features, and building debris. Water-conveyance-system components include dams, cisterns, and flumes—most associated with the former Tevis Estate in Bear Creek Redwoods OSP.

Thirty resources have not been formally recorded.

Table 4.5-2 Summary of Cultural Resources Within Midpen Lands

Site Type		Number	Sites
Bear Creek Redwoods OSP			
Historic	Boulder cluster	1	P-43-000643 (CA-SCL-760); bedrock mortars in boulder cluster used as a landscape feature
	Structures	2	P-43-000973 radio tower; P-43-000974 brick and stonework picnic area

[3] Some the historic building complexes (e.g., Alma College) include buildings that have been assigned individual CHRIS/Northwest Information Center (NWIC) primary numbers. These additional numbers have not been included in the resource totals.

[5] The majority of the listed resources are included in the Midpen GIS Cultural Resources Database, but a small number were included from BASIN's records. The Midpen database appears to be current for 2014–2016. Several of the cultural resources, especially within the Bear Creek Redwoods OSP, have been relocated and more accurately mapped in recent years; Midpen's database does not reflect those corrected locations and in some cases does not include the resource.

Site Type		Number	Sites
	Bridges	2	P-43-000980 Alma College Bridge over Briggs Creek, P-43-001224 bridge over Webb Creek
	Architecture	3	P-43-000981 Bear Creek Stables Complex; P-43-000982 Tripp Residence; P-43-003523 (CA-SCL-515) Alma College Historic District (includes several buildings P-43-003524 to P-43-003527, also classified as a cultural landscape
	Highway	1	P-44-000403 (CA-SMA-331H) Highway 35
	Archaeological site	10	P-43-001131, P-43-001132, P-43-001222, P-43-001223, P-43-001226, P-43-001227, Village, dump site, tea house site, Resource Location #2; Includes trash scatters, foundations, building debris
	Water conveyance	10	P-43-001225, cistern, small dams on Webb Creek, water intake locality, possible flume, pump house, smallest dam, wide dam, Tea House Dam, Renowden Springs
Felton Station			
Historic	Architecture	1	P-43-001079 (CA-SCL-701H) Felton Homesite; US Forest Service Felton Station
Fremont Older OSP			
Historic	Architecture	1	P-43-000403 (CA-SCL-397H) Woodhills - Cora and Fremont Older House, 1913
La Honda Creek OSP[a]			
Historic	Objects – machinery	1	P-41-002153 boiler
	Ranch complexes	2	Red Barn (Weeks Ranch); White Barn (Dyer Ranch); Driscoll Ranch Area
	Logging era features	1	Historic era logging features and sawmill sites
	Industrial	1	La Honda Oil Field
	Architecture	1	Redwood Cabin – recreational site dating to the 1920s
Long Ridge OSP			
Historic	Roads	3	P-44-000354 Old Saratoga Toll Road, P-44-000401 (CA-SCR-329H) Hwy 9 segment, P-44-000403 (CA-SCR-331H) Hwy 35 segments
	Objects – road signs	1	P-44-000393
	Orchard	1	Unrecorded

Site Type		Number	Sites
Monte Bello OSP			
Historic	None	--	--
Picchetti Ranch OSP			
Historic	Architecture	1	P-43-000419 (CA-SCL-414/H) Picchetti Bros; winery (prehistoric component probably in error)
Pulgas Ridge OSP			
Historic	Architecture	1	P-41-000161 (CA-SMA-161H) Hassler Health Home (demolished)
Purisima Creek Redwoods OSP			
Historic	Architecture	1	P-41-000186 (CA-SMA-186H) Filoli Estate; outside of preserve boundary
	Roads	3	P-41-000510 (CA-SMA-362H), P-41-000511 (CA-SMA-363H), P-41-000512 (CA-SMA-364H) all logging roads
Rancho San Antonio OSP			
Historic	Mining district	1	P-43-001867 Kaiser Permanente Quarry mining district; mostly outside of Preserve boundaries
Historic	Trash scatter	1	P-43-001633 (CA-SCL-862H)
Ravenswood OSP [a]			
Historic District	Industrial	2	P-41-002351 Schilling Arden Salt Company (Ravenswood Salt Works District) (potential historic landscape); Cooley Landing Site (Ravenswood Wharf)
	Townsite	2	Ravenswood Townsite, Runnymede (Poultry Colony Utopian Community)
	Road	1	Bay Road
	Railroad	1	SPRR Dumbarton Cutoff
	Utility	1	Ravenswood – Cooley Landing 115 kV line
Russian Ridge OSP			
Historic	Rock wall	1	P-41-002113
Saratoga Gap OSP			
Historic	Road	1	P-43-001779, Saratoga Toll Road
	Rock wall	1	P-43-001787
Sierra Azul OSP			
Historic	Mining district	1	P-43-002400 (CA-SCL-891H) Guadalupe Mines and Town, mostly outside of preserve boundary

Site Type		Number	Sites
Skyline Ridge OSP			
Historic	None	--	--
Stevens Creek Shoreline Nature Study Area			
Historic	Water-conveyance equipment	2	Unrecorded – pump station valve (B-4); flood gates (B-5)
	Architecture	1	P-43-002472 (Moffett Field) (P# recorded as Building 563, not Airfield - need correct number) adjacent to OSP boundary
Thornewood OSP			
Historic	None	--	--
Windy Hill OSP			
Historic	Open space	1	P-43-002641 (should be P-41-002641 San Mateo County)
Historic District	Architecture	1	Hawthorns Historic Complex, 800 Los Trancos Road, Portola Valley (also considered a cultural landscape)

Notes:

No known cultural resources are located in El Sereno, Foothills, St. Joseph's Hill, Teague Hill, or Tunitas Creek OSPs.

[a] The majority of the historic resources in the Ravenswood and La Honda OSPs have been documented but do not appear to have been formally recorded on California Department of Parks and Recreation 523 forms or assigned primary numbers.

Sources: (Midpen n.d.)

Archaeological Setting

The available archaeological data for Midpen lands suggests a low/moderate to high potential for both prehistoric and historic resources, depending on location. Many of the OSPs are located at higher elevations than the majority of recorded prehistoric occupation areas. Specifically, the data suggest that the majority of the OSPs appear to have been used seasonally by Native Americans, with an emphasis on hard seed and other plant collection as well as processing. It is probable that hunting and trapping of small to large mammals was conducted in conjunction with plant collection. Storage of collected plant materials has not been reported, suggesting transport of any surplus to probable lower-elevation occupation sites.

Historic resources appear to correlate with areas topographically suitable for agriculture and grazing as well as resource exploitation, with an emphasis on lumbering and processing (e.g., Bear Creek Redwoods, La Honda Creek, Purisima Creek Redwoods OSPs). Existing architectural resources are generally associated with American Period agricultural, ranching, and logging activities, with a perceived emphasis on the availability of water, suitable topography, and exploitable resources with access to transportation to local markets.

Native American Coordination and Tribal Cultural Resources

NAHC was contacted regarding tribal consultation. A review of the Sacred Lands File by the NAHC indicated sites were present for the 14 U.S. Geological Survey (USGS) quadrangles containing the OSPs (S. Fonseca and NAHC, 2020). The NAHC recommended contacting eight tribes with knowledge of the area. Midpen sent notification letters regarding the Program NOP to the eight tribal government contacts provided by the California NAHC on May 23, 2020. The tribes included (1) Amah Mutsun Tribal Band; (2) Amah Mutsun Tribal Band of Mission San Juan Bautista; (3) Costanoan Ohlone Rumsen-Mutsun Tribe; (4) Costanoan Rumsen Carmel Tribe; (5) Indian Canyon Mutsun Band of Costanoan; (6) Muwekma Ohlone Indian Tribe of the San Francisco Bay Area; (7) North Valley Yokuts Tribe; and (8) Ohlone Indian Tribe.

No tribes have requested formal notice of and information on projects within the Program area per AB 52. Midpen has engaged in informal consultation with the Amah Mutsun Tribal Band throughout the preparation of the Program. The Amah Mutsun Tribal Band provided comments on the policy aspects of the Program, which were incorporated into the Program development. The Amah Mutsun Tribal Band has also expressed interest in the PFP component of the Program and requested to be informed when preparation of the detailed PFP begins. All of these groups have been previously contacted by Midpen and will continue to be consulted as per adopted Midpen RM Policies.

4.5.3 Regulatory Setting

Federal

National Historic Preservation Act

Among those statutes enacted by Congress that affect historic properties, the National Historic Preservation Act of 1966 (NHPA) is the most significant law that addresses historic preservation. One of the most important provisions of the NHPA is the establishment of the National Register of Historic Places (NRHP), the official designator of historical resources. Districts, sites, buildings, structures, and objects are eligible for listing in the NRHP. Nominations are listed if they are significant in American history, architecture, archeology, engineering, and culture. The NRHP is administered by the National Park Service. To be eligible, a property must be significant under criterion A (history), B (persons), or C (design/construction); possess integrity; and ordinarily be 50 years of age or more. Midpen is required to evaluate Program impacts on NRHP-designated historic resources under CEQA.

State

California Register of Historical Resources

PRC §5024.1 established the California Register of Historical Resources (CRHR), which is a listing of protected properties that are eligible, or have been formally determined to be eligible, for listing in the NRHP, State Historical Landmarks, and eligible Points of Historical Interest. A historical resource may be listed in the CRHR if it meets one or more of the following criteria:

- It is associated with events that have made a significant contribution to the broad patterns of local or regional history or cultural heritage of California or the U.S.;

- It embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master or possesses high artistic values; or
- It has yielded or has the potential to yield information important in the prehistory or history of the local area, California, or the nation.

Pertinent definitions as used in the CRHR (Title 14, Chapter 11.5, Appendix A) include:

- ***Archeological Site:*** a bounded area of a resource containing archeological deposits or features that is defined in part of the character and location of such deposits or features.
- ***Cultural/Historical Resource:*** any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or which is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural history of California.
- ***Site:*** a location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historical, cultural, or archeological value regardless of the value of any existing building, structure, or object. A "site" need not be marked by physical remains if it is the location of a prehistoric or historic event and if no building, structures, or objects marked it at that time. Examples include trails, designed landscapes, battlefields, habitation sites, Native American ceremonial areas, petroglyphs, and pictographs.

Any historic resource on Midpen lands listed in the CRHR would have specific regulatory protections in place. Midpen would be required to adhere to all regulations pertaining to tribal cultural resources during Program implementation.

Public Resources Code

PRC Section 21074

Tribal cultural resources have the following meaning under PRC § 21074(a):

1. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
   a. Included or determined to be eligible for inclusion in the CRHR
   b. Included in a local register of historical resources as defined in PRC § 5020.1(k)
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC § 5024.1(c). In applying the criteria set forth in PRC § 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe
3. A cultural landscape that meets the criteria of PRC § 21074(a) if the landscape is geographically defined in terms of the size and scope
4. A historical resource as described in PRC § 21084.1, a unique archaeological resource as defined in PRC § 21083.2, or a non-unique archaeological resource as

defined in PRC § 21083.2 may also be a tribal cultural resource if it meets the criteria of PRC § 21074(a)

Any tribal cultural resource on Midpen lands, as defined by PRC § 21074, would have specific regulatory protections in place. Midpen would be required to adhere to all regulations pertaining to tribal cultural resources during Program implementation.

PRC Section 21084.1

PRC § 21084.1 stipulates that any resource listed in, or eligible for listing in, the CRHR is presumed to be historically or culturally significant. Resources listed in a local historic register or deemed significant in a historical resources survey (as provided under PRC § 5024.1g) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not. A resource that is not listed in, or not determined to be eligible for listing in, the CRHR and neither included in local register of historical resources nor deemed significant in a historical-resource survey may nonetheless be historically significant. This provision is intended to give the Lead Agency discretion to determine that a resource of historic significance exists where none had been identified before and to apply the requirements of PRC § 21084.1 to properties that have not previously been formally recognized as historic. Midpen would have the ability to designate properties or items as historically or culturally significant under this regulation. Any additional resources given this designation by Midpen would have the same regulatory protections as those listed in the CRHR, which Midpen would adhere to during Program implementation.

PRC Section 21083.2

PRC § 21083.2 provides that where a project may adversely affect a unique archaeological resource, the Lead Agency must treat that effect as a significant environmental effect and provide for more specific mitigation measures if the impact cannot be avoided. PRC §§ 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources.

A "Unique Archaeological Resource"[5] means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and about which there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.

[5] Defined in a Glossary of Terms as used in the CRHR (Title 14, Chapter 11.5, Appendix A).

- Is directly associated with a scientifically recognized important prehistoric or historic event or person (CAL/OHP 2001: #10:30 [PRC § 21083.2 subd (g) defining unique archeological resource]).

Midpen would comply with the mitigation requirements of PRC § 21083.2 if the Program is determined to adversely affect a unique archaeological resource.

PRC Section 5097.5, 5097.9

PRC § 5097.5 prohibits removal, defacement, or destruction of archaeological, paleontological, prehistoric, or historic resources and sites on public lands. Midpen would be required to comply with PRC Section 5097.5 if archaeological, paleontological, prehistoric, or historic resources and sites are found on Midpen lands during Program implementation. PRC § 5097.9 bars public agencies or private parties occupying public land from interfering with the free expression or exercise of Native American religion on public land. Midpen would coordinate with local Native American tribes during Program implementation to comply with PRC § 5097.9.

PRC Section 5097.98-5097.991

PRC § 5097.98 outlines the procedures that must be implemented if Native American human remains are discovered. Upon the discovery of Native American remains, the landowner is required to ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the most likely descendants (MLDs). The landowner shall discuss and confer all reasonable options with the descendants regarding their preferences for treatment. Midpen would comply with PRC § 5097.98 if Native American human remains are discovered during Program implementation. PRC §§ 5097.99 and 5097.991 mandate that it is the policy of the State to repatriate Native American remains and associated grave goods.

Assembly Bill 52

Governor Brown signed AB 52 (Chapter 532, Statutes of 2014), which went into effect July 1, 2015. AB 52 established a formal consultation process for California Native American tribes as part of CEQA. The law requires a lead agency to consult with a tribe that requests consultation and is traditionally and culturally affiliated with the geographic area in which the proposed plan or project would be located. To be notified of such proposed plans or projects, tribes must first request notification from the lead agency. When a tribe has requested notice, the lead agency is required to contact the tribe within 14 days of determining that a plan or project in the geographic area traditionally and culturally affiliated with the tribe would be undertaken. Tribes that wish to be engaged in consultation must respond to the lead agency within 30 days. Consultation may include discussion of issues such as the appropriate level of environmental review for the proposed plan, the significance of the proposed plan's potential impacts on tribal cultural resources, and the availability of mitigation measures or project alternatives that could lessen effects of the project, if any, on tribal cultural resources. As previously mentioned, no tribes have formally requested consultation under AB 52 in the Program area on Midpen lands.

California Health and Safety Code

Section 7050.5(b) of the California Health and Safety Code requires that in the event of discovery of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the County coroner has been notified. The coroner must investigate the remains, and if he or she determines that the remains are Native American, the coroner must call the NAHC within 24 hours. The Commission must then immediately notify those persons it believes to be most likely descended from the decedent. This provision would apply to any inadvertent discoveries of human remains during implementation of Program activities.

California Native American Graves Protection and Repatriation Act

The California Native American Graves Protection and Repatriation Act of 2001 (CANAGPRA) is the State repatriation policy for Native American Remains (Health and Safety Code § 8010 *et seq.*) and would also apply to the discovery of any Native American remains during Program implementation. The Act is designed to achieve the following:

- Ensure that a consistent State policy is followed with respect to handling of all California Indian human remains and cultural items and that the State's repatriation policy is applied consistently with the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC § 3001 *et seq.*);
- Facilitate implementation of the provisions of NAGPRA with respect to publicly funded agencies and museums in California and encourages voluntary disclosure and return of remains and cultural items by agencies and museums;
- Provide a mechanism whereby lineal descendants and culturally affiliated California Indian tribes that file repatriation claims for human remains and cultural items under NAGPRA or CANAGPRA, with State agencies and museums, may request assistance from the commission in ensuring that State agencies and museums are responding to those claims in a timely manner and in facilitating the resolution of disputes regarding those claims; and
- Provide a mechanism whereby California tribes that are not federally recognized may file claims with agencies and museums for repatriation of human remains and cultural items.

Local

Midpeninsula Regional Open Space District – Resource Management Policies

Midpen's resource management includes management of natural, cultural, and agricultural resources. Midpen recognizes the protection of cultural resources as one of the primary benefits of open space (Midpen, 2014a). The following strategies, goal, and policies relate to cultural resources under the Program:

Strategy 2 Provide an effective interdisciplinary program to protect and enhance natural and cultural resources. This program should include planning,

interpretation, research, protection, maintenance, and monitoring practices.

Strategy 9 Increase public knowledge, understanding, and appreciation of the natural and cultural resources of the preserves, and support for their conservation.

Goal CR Identify, protect, preserve, and interpret cultural resources for the benefit of present and future generations.

Policy CR-1 Maintain an inventory of cultural resources on District preserves.

Policy CR-2 Address cultural resources in the development of preserve use and management plans.

Policy CR-3 Protect cultural resources from disturbance to the maximum extent feasible.

Policy CR-4 Preserve and maintain cultural resources wherever feasible.

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014b). Midpen uses the Vision Plan to guide management decisions related to the lands and open spaces that would be a part of this Program. The following themes and goals pertain to cultural resources within Midpen lands:

Sense of Place:

- Maintain a sense of place by protecting and increasing access to locally significant, iconic natural or cultural features.

Steward Many Cultures:

- Protect immediately at-risk, culturally significant resources and promote their responsible stewardship.
- Promote partnerships that preserve and/or enhance cultural resources.

San Mateo County – General Plan

Midpen lands within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals and objectives regarding Historical and

Archaeological Resources Policies in the San Mateo County General Plan are applicable to cultural resources (San Mateo County, 2013):

5.1 **Historic Resource Protection**. Protect historic resources for their historic, cultural, social and educational values and the enjoyment of future generations.

5.3 **Protection of Archaeological/Paleontological Sites**. Protect archaeological/paleontological sites from destruction in order to preserve and interpret them for future scientific research, and public educational programs.

5.20 **Site Survey**. Determine if sites proposed for new development contain archaeological/paleontological resources. Before approval of development for these sites, require that a mitigation plan, adequate to protect the resource and prepared by a qualified professional, be reviewed and implemented as a part of the project.

5.21 **Site Treatment**

1. Encourage the protection and preservation of archaeological sites.
2. Temporarily suspend construction work when archaeological/paleontological sites are discovered. Establish procedures which allow for the timely investigation and/or excavation of such sites by qualified professionals as may be appropriate.
3. Cooperate with institutions of higher learning and interested organizations to record, preserve, and excavate sites.

Santa Clara County – General Plan

Midpen lands within Santa Clara County are subject to the stipulations outlined in the Santa Clara County General Plan. The Resource Conservation Chapter of the Santa Clara County General Plan includes the following strategies and policy objectives related to the identification, protection, and enhancement of cultural resources in Santa Clara County (Santa Clara County, 1994):

Strategy #2: Prevent or Minimize Adverse Impacts on Heritage Resources

Strategy #3: Restore, Enhance and Commemorate Resources

C-RC 49 Cultural heritage resources within Santa Clara County should be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values.

C-RC 50 Countywide, the general approach to heritage resource protection should include the following strategies:

1. Inventory and evaluate heritage resources.
2. Prevent or minimize adverse impacts on heritage resources.
3. Restore, enhance, and commemorate resources as appropriate.

C-RC 51 Inventories of heritage resources should be maintained as the basis for local decision-making regarding such resources.

C-RC 52 Prevention of unnecessary losses to heritage resources should be ensured as much as possible through adequate ordinances, regulations, and standard review procedures. Mitigation efforts, such as relocation of the resource, should be employed where feasible when projects will have significant adverse impact upon heritage resources.

C-RC 54 Heritage resources should be restored, enhanced, and commemorated as appropriate to the value and significance of the resource.

Santa Cruz County – General Plan

Midpen lands within Santa Cruz County are subject to the stipulations outlined in the Santa Cruz County General Plan. Chapter 5, Conservation and Open Space, of the Santa Cruz County General Plan contains the following policies related to the identification, protection, and enhancement of cultural resources in Santa Cruz County (Santa Cruz County, 1994):

5.19.1 **Evaluation of Native American Cultural Sites**. Protect all archaeological resources until they can be evaluated. Prohibit any disturbance of Native American Cultural Sites without an appropriate permit. Maintain the Native American Cultural Sites ordinance.

5.19.2 **Site Surveys**. Require an archaeological site survey (surface reconnaissance) as part of the environmental review process for all projects with very high site potential as determined by the inventory of archaeological sites, within the Archaeological Sensitive Areas, as designated on General Plan and LCP Resources and Constraints Maps filed in the Planning Department

5.19.3 **Development around Archaeological Resources**. Protect archaeological resources from development by restricting improvements and grading activities to portions of the property not containing these resources, where feasible, or by preservation of the site through project design and/or use restrictions, such as covering the site with earthfill to a depth that ensures the site will not be disturbed by development, as determined by a professional archaeologist.

5.19.5 **Native American Cultural Sites**. Prohibit any disturbance of Native American Cultural Sites without an archaeological permit which requires, but is not limited to, the following:

1. A statement of the goals, methods, and techniques to be employed in the excavation and analysis of the data, and the reasons why the excavation will be of value.
2. A plan to ensure that artifacts and records will be properly preserved for scholarly research and public education.
3. A plan for disposing of human remains in a manner satisfactory to local Native American Indian groups.

5.20.5 **Encourage Protection of Historic Structures**. Encourage and support public and private efforts to protect and restore historic structures and to continue their use as an integral part of the community.

4.5.4 Impact Assessment Methodology

Significance Criteria

The impacts of the proposed Program on cultural resources would be considered significant if they exceeded the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;
- Disturb any human remains, including those interred outside of formal cemeteries; or
- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:
  - Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC § 5020.1(k); or
  - A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC § 5024.1.

(See CEQA Guidelines, Appendices G and I)

Analysis Methodology

Under CEQA, a project may cause a substantial adverse change in the significance of a historical or cultural resource through demolition, destruction, relocation, or alteration of a resource or its

immediate surroundings. Changes are considered adverse when the proposed action(s) diminish the integrity of a property's location, setting, materials, workmanship, feeling, or association for which it is eligible for listing in the NRHP or CRHP. The analysis presented in this section was performed using qualitative and comparative methods that involve identifying the areas where known cultural resources occur and identifying the potential for implementation of the VMP, PFP, and Wildland Fire Pre-Plan to damage these resources. All available data was consulted to identify any known cultural resources. Midpen maintains a confidential cultural GIS database and in-house records regarding the locations and descriptions of known cultural resources within its boundaries. The information has been compiled over time primarily on a project-by-project basis and occasionally by CHRIS/NWIC archive searches. The cultural resource records do not cover all Midpen lands and are incomplete. Consideration was given for the types of undiscovered resources that could be damaged by Program activities, based on the history of Midpen lands. Additional considerations were made to account for the potential for activities to encounter and impact previously undiscovered resources and/or tribal cultural resources. Mitigation has been included to minimize potential for effects and to address tribal concerns.

It is not feasible, at a Program level, to survey all areas of Midpen's lands at one time. This being the case, the approach is to continue to do site-specific surveys prior to conducting any type of work that could impact cultural resources and to avoid any resources found, or else to address and minimize impacts to the resources through data recovery. Data recovery is the method by which cultural resources are excavated from the found location in such a way that the resource remains intact and can be removed from the site. The mitigation identifies the requirements for surveys and methods to avoid or mitigate any impacts to discovered resources prior to implementation of activities in an area that could impact resources.

4.5.5 Impact Analysis

	Significance Determination
Impact Cultural Resources-1: Substantial adverse change in the significance of a historical or archaeological resource pursuant to CEQA Guidelines Section 15064.5.	**Less than significant with mitigation**

Overview

Impacts from Program activities could occur primarily from any activity that could disturb the ground surface. Impacts could occur if a known or previously undiscovered significant archeological or historic resource is damaged or destroyed by any Program activities. Intensive vegetation thinning and removal, prescribed burning, and use of heavy equipment, in particular, have some potential to cause adverse changes to significant cultural resources, as could installation of new firefighting infrastructure under the Wildland Fire Pre-Plan, since this work could involve excavation.

Many of the known cultural resources in the Program area are historic structures and districts. These types of larger built-environment structures would not be impacted by Program

activities, as the activities include direct changes or alterations neither to such structures nor to the context of such structures. Historic roads, fences, foundations, bridges, stables, residence and ranch complexes, logging and sawmill facilities, oil fields, and the like would not be impacted by the majority of activities under the Program (with the exception of potential installation of new infrastructure under the Wildland Fire Pre-Plan). The impacts discussion is therefore focused on pre-historic resources and scattered historic resources (such as glass fragments or debris sites) that could be found on or buried beneath the ground surface.

Analysis of Tools and Techniques

Manual Techniques

Manual techniques that result in limited ground disturbance, such as pruning or pulling small weeds and shrubs by hand, or felling of trees with chainsaws, generally pose a low risk of damaging or destroying cultural resources due to the limited ground disturbance associated with the activity. Hand removal or removal of weeds using hand tools could result in the exposure of a previously buried or concealed (such as in vegetation) cultural resource but would not damage the resource. Resources would likely be visible to workers conducting management by hand as tools are placed on the surface. If a worker did not realize that the material uncovered could be a cultural resource, damage may occur from continuing work. Midpen requires workers to be trained in the recognition of a resource and to halt work in the event of a find until evaluation can be conducted (IPMP BMP 26), and then hand methods can continue avoiding the resource. Forces are much less than those for mechanical removal, and while manual methods may churn up resources, the resources would likely be seen and not damaged due to worker training and cessation of work. Impacts from use of manual methods would not significantly impact historic or archaeological resources.

Mechanical Techniques

Heavy equipment would be used to conduct a variety of activities ranging from vegetation trimming to installation of firefighting infrastructure. Mechanical methods that require the use of heavy equipment and ground disturbance of at least the top layer of soil could unearth and damage cultural resources. Activities that could disturb the top layer of soil include grading and scraping for infrastructure, or pulling up trees or large shrubs from the roots with heavy equipment. Use of heavy equipment could crush and damage cultural resources on or directly below the soil surface. The potential to uncover or discover previously undiscovered resources is low/moderate to high, depending on location. Several prehistoric resources and historic resources have been recorded or identified within Midpen lands; however, records are incomplete and not reflective of more recent mapping completed in recent years. Due to data gaps regarding the locations and descriptions of known cultural resources on Midpen lands, known resources as well as previously undiscovered resources could also be uncovered and damaged. Impacts on archeological and historical resources would be potentially significant.

Midpen requires staff at each site to receive training in the recognition of sensitive cultural resources and to halt work in the event of any cultural-resource discovery until a qualified archaeologist can evaluate the significance of the find (IPMP BMP 26). The BMP and condition, however, neither accounts for the avoidance of known resources nor identifies the need for

additional cultural resources surveys in areas prior to work. Given the extent and scale of proposed work using mechanical equipment, incidental avoidance during work may not be sufficient to ensure no impacts to resources. Without additional surveys prior to conducting work that could disturb the surface, impacts to potentially eligible cultural resources could still occur and would be considered significant.

MM Cultural-1 requires review of Midpen's existing GIS data on cultural-resource survey areas and identification of known cultural resource locations overlapping work areas prior to performing any work. The measure also requires an optional records search at the local Information Center. Pre-activity surveys would be required in areas not previously surveyed if the work involves heavy equipment and ground disturbance. Training conducted under IPMP BMP 26 would be sufficient for areas with low visibility due to high-density vegetation making surveys impossible. Most known resources have not been evaluated for their eligibility in the CRHR, so they are assumed to be eligible and, thus, significant resources per PRC § 21084.1. MM Cultural-1 also requires that any identified cultural resources (either from previous surveys or during pre-activity surveys) within areas proposed for work be avoided and the area of avoidance marked in the field. If work must occur in the area of a resource, impacts on the resource would be avoided through use of hand methods only, using hand tools or hand-powered tools and access on foot, with no substantial ground disturbance allowed. If the resource is evaluated for eligibility, and also evaluated to determine if it is a tribal cultural resource, and found to be neither, work could proceed as normal. If the resource cannot be avoided, MM Cultural-2 would be implemented to treat the resource and collect its important data and information through a Treatment Plan prior to the Program work being conducted. With implementation of mitigation, the impacts from use of heavy equipment and ground-disturbing activities (from mechanical vegetation removal) on known, unrecorded, and previously undiscovered cultural resources would be reduced to less than significant.

Propane flaming, a proposed mechanical technique, would generally be conducted within Midpen lands and would not involve ground disturbance. The impact on known and previously undiscovered cultural resources would be less than significant due to the minimal potential for ground disturbance. No mitigation is required.

Chemical Application

Chemical application currently occurs across Midpen lands in accordance with the IPMP. Herbicides would be applied by hand or from an ATV, and use is limited. No broadcast or aerial spraying would occur. Chemical application would not involve earth-disturbing activities that could affect surface or subsurface resources nor would it affect any built-environment structures. Therefore, chemical treatment options would not adversely affect cultural resources. The impact would be less than significant.

Prescribed Herbivory

Grazing would have minimal ground disturbance other than some interruption of topsoil from animal tracks. Surface and subsurface archaeological deposits would not likely be impacted by grazing. While animals could churn up some soils containing resources, grazing animals do not

have enough directed force to significantly damage resources. To further reduce any likelihood of potential impacts from grazing, MM Geology-3 requires implementation of design features to minimize erosive effects of livestock trails, which would ensure that overgrazing and soil erosion does not occur that could unearth and damage cultural resources. Impacts from grazing would be less than significant.

Prescribed Burning

Prescribed burning would pose little to no risk of ground disturbance because ignition is performed by hand application to the surface. Prescribed burns would be conducted away from buildings and structures and, thus, would not impact built-environment features. Cultural resources located on the surface may be obscured by vegetation or plant litter. Prescribed burns could damage cultural resources by scorching, creating a buildup of residue on the resource, or fracturing or could destroy the resource (NPS, 2016). The structural and geochemical characteristics of some types of prehistoric artifacts could be altered, affecting their information potential. Soil surface temperatures may be quite high during the burn; however, the depth at which soil temperature fluctuates during a prescribed burn varies dependent upon quantity of duff on the forest floor, moisture content, and types of vegetation present. Soil temperatures generally do not exceed 140 degrees Fahrenheit below 3.5 centimeters and 100 degrees Fahrenheit below 7 centimeters during a low-intensity fire, such as a prescribed burn (Uotila & Levula, 2012; Valette, Gomendy, Marechal, Houssard, & Gillon, 1994). This being the case, most buried cultural resources, which are typically more than 7 centimeters below the surface, would not be affected by prescribed burns. The impact on superficially deposited cultural resources from prescribed burning and the use of heavy equipment during suppression and mop-up activities, however, could potentially impact a cultural resource on or near the ground surface.

Midpen requires staff at each site to receive training in the recognition of sensitive cultural resources and to halt work in the event of any cultural resource discovery until a qualified archaeologist can evaluate the significance of the find (IPMP BMP 26). The BMP and condition, however, does not require the avoidance of known resources nor does it identify the need for additional cultural-resources surveys in areas prior to work. Prescribed burns would extend into areas where workers are not readily located, so incidental discovery by workers is not adequate to reduce potential impacts to cultural resources. The impact would remain potentially significant. MM Cultural-1 requires a desktop review and a pre-activity survey if the area has not been previously surveyed, with the objective of determining the presence/absence of known cultural-resource locations before any work commences. Any found resources are either to be avoided entirely or to be evaluated for eligibility and, if eligible but not avoidable, treated under MM Cultural-2. Impacts on cultural resources would be reduced to less than significant through implementation of mitigation.

Access and Vehicle Travel

Heavy-equipment access for vegetation-management implementation along existing access roads, trails, and former roads would not result in any significant impacts beyond the previous impacts caused by their original construction. Improvements necessary for access within the current road/trail footprint would not result in any significant impacts as work would only

occur within the previously disturbed areas. Access to management areas not accessible by existing roads and trails would be achieved by creating skid trails. Clearing of skid trails could expose and damage cultural resources, resulting in a potentially significant impact.

Midpen requires staff at each site to receive training in the recognition of sensitive cultural resources and to halt work in the event of any cultural resource discovery until a qualified archaeologist can evaluate the significance of the find (IPMP BMP 26). The impact would remain potentially significant, however, as not all resources may be incidentally discovered during work, particularly of workers are traveling in vehicles or on equipment. MM Cultural-1 requires a GIS and potential Information Center records review and a pre-activity survey of each proposed vegetation management location where no previous surveys have been conducted, with the objective of determining the presence/absence of known cultural-resource locations before any work commences. Any found resources are either to be avoided entirely or to be evaluated for eligibility and, if eligible but not avoidable, treated under MM Cultural-2. Impacts on cultural resources would be reduced to less than significant through implementation of mitigation.

Analysis of Plans

Vegetation Management Plan

VMAs would be created and maintained by cutting and mowing vegetation and by removing small trees, brush, and ladder fuels. As previously mentioned, implementation of the VMP would not impact the cultural significance of built-environment historical resources in the Program area. Thinning of vegetation is a temporal action and would not change the context, character, or defining features of any of the built-environment historic structures or districts. The work would not impact any of the known or potential cultural landscapes since those present or potentially present are all built-environment landscapes. The only potential for impacts from implementation of the VMP is to significant known and unknown surficial or buried resources (prehistoric or historic) through use of heavy equipment and ground disturbance.

In areas that have not been previously surveyed, undiscovered archaeological and historic resources could be encountered and damaged or destroyed during VMA creation or maintenance. IPMP BMP 26 requires that staff receive training in the recognition of sensitive cultural resources and that, in the event of a find, work in the area is halted until a qualified archaeologist can evaluate the significance of the find. Workers would be trained to recognize and avoid cultural resources per IPMP BMP 26; however, the potential would still exist to significantly damage a cultural resource during implementation of the work given the extent and scale of the work. Incidental discovery during work may not be sufficient to prevent impacts to all resources. Any action that damages or destroys a significant archaeological or historic resource would be considered a potentially significant impact.

MM Cultural-1 requires review of existing GIS databases to determine if a cultural resource survey has been conducted in the area of work and requires conducing a pre-activity survey of any VMAs not previously surveyed. Identified resources would be avoided or treated with

hand methods to minimize impacts. Training conducted under IPMP BMP 26 would be sufficient for areas with low visibility due to high-density vegetation making surveys impossible. If any found resources are evaluated and found ineligible, work would proceed. If evaluated resources are found eligible and the area cannot be avoided, work would only proceed on foot using hand tools, and no substantial ground disturbance or pile burning would be allowed in the area of the resource to avoid impacts on the resource. New resources noted during the inventory would be recorded and mapped with an appropriate buffer, per MM Cultural-1. Impacts would be less than significant with incorporation of mitigation.

Prescribed Fire Plan

Prescribed burns would involve use of heavy equipment and vehicles during pre-treatment, the burn, and mop up of the burn. Most buried cultural resources, which are typically more than 7 centimeters below the surface, would not be affected by prescribed burns. The impact on superficially deposited cultural resources from prescribed burning and the use of heavy equipment during suppression and mop-up activities would be potentially significant. Use of heavy equipment has the potential to physically damage known, or previously unrecorded or undiscovered, cultural resources located on the ground surface or subsurface. Burning could scorch or crack cultural resources on the surface.

Midpen requires staff at each site to receive training in the recognition of sensitive cultural resources and to halt work within 50 feet of any cultural resource discovery until a qualified archaeologist can evaluate the significance of the find (IPMP BMP 26; Contract Condition 4.3). The BMP and condition, however, does not require the avoidance of known resources, nor does it identify the need for additional cultural-resources surveys in areas prior to work. Prescribed burns would extend into area where workers are not readily located, so incidental discovery by workers is not adequate to reduce potential impacts to cultural resources. The impact would remain potentially significant. MM Cultural-1 requires a desktop review and a pre-activity survey if the area has not been previously surveyed, with the objective of determining the presence/absence of known cultural-resources locations before any work commences. Any found resources are either to be avoided entirely or evaluated for eligibility and, if eligible but not avoidable, treated under MM Cultural-2. Impacts on cultural resources would be reduced to less than significant through implementation of mitigation.

Wildland Fire Pre-Plan

Installation or construction of roads, staging and landing areas, and other firefighting infrastructure would involve use of vehicles and heavy equipment that could result in damage to known or previously undiscovered cultural resources, which would be a significant impact. All workers would be trained to identify and avoid potential cultural resources and, if an undiscovered resource is encountered, to stop work in the area of the discovery until it can be evaluated and treated (Contract Condition 4.3; IPMP 26). Given the permanent and more significant disturbance associated with installation of infrastructure under the Wildland Pre-Fire Plan, incidental discovery and avoidance during implementation of the work would not be sufficient to ensure no impacts to the resources. Impacts to known or unknown potentially eligible buried or surficial cultural resources would be potentially significant. MM Cultural-1

requires review of existing records and conducting a survey if the area of the infrastructure has not been previously surveyed (and would impact the ground surface or subsurface). Known resources would either be avoided or MM Cultural-2 would be implemented to further ensure that treatment of a significant cultural resource that cannot be avoided or preserved in place be guided by a Treatment Plan, to be submitted to Midpen for approval. MM Cultural-2 would also be implemented to mitigate any contextual impacts to built-environment historic resources if the new infrastructure were to impact the resources significance through visual impacts. Impacts would be less than significant with implementation of these measures.

	Significance Determination
Impact Cultural Resources-2: Disturbance of human remains, including those interred outside of formal cemeteries.	**Less than significant with mitigation**

The likelihood of discovering human remains is relatively low for most areas since data suggests that the majority of the OSPs appear to have been used seasonally by Native Americans. Human remains are known or suspected to occur in some OSPs. Although considered unlikely, future Program activities have the possibility of disturbing human remains within the OSPs, which would be a potentially significant impact.

Areas near perennial creeks in lowland valleys have a higher potential for encountering human remains than other areas, like along peaks and ridgelines. Human remains are usually encountered during work activities that disrupt at least 6 inches of soil subsurface. Vegetation removal using heavy equipment under the VMP and installation of new firefighting infrastructure under the Wildland Fire Pre-Plans are the actions with at least some potential for encountering of human remains. If human remains are encountered, MM Cultural-3 requires work to halt within 50 feet of the discovery of human remains, and contact with the County Coroner's office to be made, followed by the appointment of a most likely descendent to determine the appropriate course of action. The impact on human remains would be reduced to less than significant with implementation of mitigation.

Impact Cultural Resources-3: Substantial adverse change in the significance of a tribal cultural resource that is listed, or eligible for listing in, the California Register of Historical Resources or in a local register of historical resources, as defined in PRC § 5020.1(k), or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC § 5024.1.	Significance Determination
	Less than significant with mitigation

Implementation of the Program has the potential to significantly impact known and previously undiscovered archaeological resources through any activity that could disturb the ground surface or subsurface (refer to Impact Cultural Resources-1). Any prehistoric resource discovered, as addressed in Impact Cultural Resources-1, could be considered a tribal cultural resource as well.

Treatment methods would be conducted according to Midpen's policies, which requires that staff receive training in the recognition and avoidance of sensitive cultural resources, all work halted in the event of a discovery, and a Midpen representative be notified immediately in the event of a find (IPMP BMP 26). Due to the scale of work proposed under the Program, incidental avoidance of resources during work may not be sufficient to ensure no impacts to pre-historic resources that could also be tribal cultural resources.

Several mitigation measures are identified by treatment action to reduce impacts on CRHR-eligible resources to less than significant. MM Cultural-1 requires a desktop review and field inventory of each proposed vegetation-management location, with the objective of determining the presence/absence of known cultural-resources locations before any work commences and avoiding impacts on any known resources. Any found resources are either to be avoided entirely or to be evaluated for eligibility and, if eligible but not avoidable, treated under MM Cultural-2, which also includes consultation with Native American tribes if the resource is found to be pre-historic. New resources noted during the inventory would be recorded and mapped on project plans with an appropriate buffer. MM Cultural-2 requires that treatment of a significant cultural resource that cannot be avoided or preserved in place be guided by a Treatment Plan, to be submitted to Midpen for approval. See Impact Cultural Resources-1 for the discussion by tool and technique as well as by plan. Impacts on tribal cultural resources would be less than significant with implementation of mitigation.

The Native American Heritage Commission has noted that resources are listed on the Sacred Lands Inventory of Importance for the Ohlone Native Americans within the OSPs. To date, representatives of the Ohlone tribes have not indicated any other known tribal cultural resources beyond the archaeological resources that can be found throughout Midpen's land in the Program area. Records are limited to projects that have occurred over time and, this being the case, are not comprehensive. On May 23, 2020, Midpen sent notification letters regarding the Program NOP to eight tribal government contacts provided by the California Native American Heritage Commission. No tribes requested formal notice of information on projects within the Program area per AB 52. Midpen has engaged in informal consultation with the Amah Mutsun Tribal Band. During initial meetings with the Tribe, however, representatives expressed interest in the PFP component of the Program and requested to be informed when preparation of the detailed PFP begins.

4.5.6 Mitigation Measures

MM Cultural-1: Pre-Activity Surveys and Avoidance of Impacts to Cultural Resources

Prior to conducting any work associated with the WFRP that could disturb the ground surface or subsurface, the work areas shall be compared against Midpen's GIS data to determine if the area has been previously surveyed and, if it has been surveyed, if any historic or archaeological resources or tribal cultural resources are found in the work area. Any resources that have not been evaluated shall be assumed eligible for listing in the CRHR and assumed significant.

If the GIS data shows that the proposed areas where soil disturbance below the surface via heavy equipment or burning (i.e., for VMP activities involving heavy equipment, prescribed fires under the PFP, and any work that involves grading under the Wildland Fire Pre-Plans) have not been previously surveyed, then a discretionary archival-records search at the California Historical Resources Information System, Northwest Information Center, can be completed. If the area is still not found to have been previously surveyed, a pre-activity cultural-resources survey shall be conducted by a qualified archaeologist or cultural resources specialist in accordance with industry standards prior to performing work unless vegetation is too dense, making a survey impossible. In the event vegetation is too dense, making a pre-activity survey challenging or impossible, the training conducted under IPMP BMP 26 shall be sufficient to permit work to be conducted using only manual techniques accessed on foot.

New resources noted during the field survey shall be recorded and mapped on appropriate California Department of Parks and Recreation 523 forms. In the case of a previously recorded resource, an updated California Department of Parks and Recreation 523 form detailing current condition shall be completed, as appropriate.

Any historical or archaeological resources (not including built-environment historic features) located in the work area (as identified in either previous surveys, in a discretionary records search, or during pre-activity surveys) plus a 50-foot buffer shall be identified on any activity plans. The boundaries around the resource/buffer shall be temporarily marked, such as with fencing or flagging. If work must commence in the sensitive area, it can only be performed using hand tools or hand- powered tools, cannot include ground disturbance below the topsoil layer, and can only be accessed on foot. Alternatively, the resource can be evaluated for eligibility under the CRHR. If found ineligible and not a tribal cultural resource, work could proceed as normal. If found eligible or to be a tribal cultural resource, impacts on the resource must be avoided (through total avoidance of the area or through use of hand methods only in the area of the resource, as described here). If not avoidable, MM Cultural-2 shall be implemented. After work is completed, all cultural resource delineators (e.g., flags or fencing) shall be removed in order to avoid potential vandalism, unauthorized excavation(s), etc.

Midpen shall contact and consult with local Native American groups identified by the Native American Heritage Commission and request input on Tribal Cultural Resources within the project areas if any prehistoric resources are identified during pre-activity surveys and impacts to these resources cannot be avoided or minimized (such as through the use of hand tools). The Midpen Project Manager shall have the discretion to consult, depending on the potential impacts anticipated from the Program activity. Information on the proposed activity, the results of the information review(s) and field inventory, and any Native American input shall be reported in a Memo to the File with the implemented mitigation measures based on anticipated impacts.

Applicable Location(s): All work areas prior to conducting Program activities.

Performance Standards and Timing:

- **Before Activity:** Consult the GIS cultural-resources layer for the presence of recorded sites.
- **During Activity:** 1) Avoid recorded resources or impacts on resources or use only hand methods in resource areas and (2) examine area where piles are proposed for resources.
- **After Activity:** Remove resource delineators, add any newly discovered resources to GIS database.

MM Cultural-2: Treatment of Unavoidable Resources

For any resources either discovered during implementation of activities (per IPMP BMP 26) or found during pre-activity surveys under MM Cultural-1 and that cannot be avoided, recordation, additional archaeological testing, Native American consultation (if pre-historic), and data recovery shall be implemented. Data recovery for any significant cultural resources that cannot be avoided or preserved in place shall be guided by a Treatment Plan, to be submitted to Midpen for approval and completion.

Impacts shall be assessed for the installation of new permanent infrastructure under the Wildland Fire Pre-Plans near a built-environment historic feature, landscape, or district. The new infrastructure shall either be relocated if an effect is likely or data recovery implemented in accordance with a Treatment Plan (as previously discussed).

A report of the findings and resource interpretation, disposition of any recovered cultural materials, and recommendations for future resource protection shall be completed and filed with Midpen, interested Native Americans, the California Historical Resources Information System (if pre-historic), and the Northwest Information Center.

Applicable Location(s): Any area where cultural resources impacts cannot be avoided.

Performance Standards and Timing:

- **Before Activity:** Determine if resource cannot be avoided and prepare Treatment Plan and data recovery as well as consult tribes if pre-historic.
- **During Activity:** For resources found during work that cannot be avoided, prepare Treatment Plan and data recovery.
- **After Activity:** Notify appropriate parties and agencies.

MM Cultural-3: Human Remains

If human remains and associated or unassociated funerary objects are exposed during vegetation management, work within 50 feet of the discovery shall be halted and the find protected from further disturbance in accordance with Midpen protocols for resource protection. The County Coroner or Medical Examiner shall be notified immediately and, in the event of the determination that the human remains are Native American remains, notification of the Native American Heritage Commission shall be undertaken to obtain a most likely descendant (MLD) (PRC § 5097.98) for treatment recommendations. Midpen, the archaeological consultant, and the MLD shall make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines Section 15064.5[d]). The agreement shall take into consideration the appropriate removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects.

Implementation of the Treatment Plan shall be undertaken by Midpen, and any findings shall be submitted in a report to the MLD and filed with the California Historical Resources Information System, NWIC.

Applicable Location(s): All Program areas, if applicable.

MM Cultural-3: Human Remains

Performance Standards and Timing:

- **Before Activity:** N/A
- **During Activity:** (1) Avoid known location of human remains, (2) cease activity if human remains are uncovered, (3) appoint an MLD, (4) protect human remains until a decision is reached, and (5) if avoidance is not possible, Midpen, a professional archaeologist, and an MLD shall be consulted and human remains and associated or unassociated funerary objects shall be removed from the location and relocated to selected location in accordance to decision reached. Once remains are moved, then the activity can commence again in this area.
- **After Activity:** N/A

MM Geology-3: Fire Lines During Prescribed Burns

See Section 4.6: Geology and Soils

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4.6 Geology and Soils

4.6.1 Introduction

This section defines the geological and seismic setting within the Program area and presents an evaluation of the potential effects from landslides, loss of topsoil, and erosion from implementation of the Program. The analysis is based on publicly available planning documents and scientific studies such as the Natural Resource Conservation Service (NRCS) soil survey (NRCS, 2020).

Comments related to geology and soils impacts were received during the public scoping period. A summary of these comments and the location where they are addressed in the geology and soils analysis are provided in Table 4.6-1.

Table 4.6-1 Geology and Soils Scoping Comments

Summary of Comment	Location Addressed
The EIR must address how fire management can increase landslides, especially in the rainy Santa Cruz mountains or similar areas, because vegetation helps stabilize slopes and most of Midpen's preserves are located in areas susceptible to significant rain events and earthquakes.	Section 4.6.5: Impact Analysis
How would increase landslide risk be mitigated.	Section 4.6.5: Impact Analysis Section 4.6.6: Mitigation Measures

4.6.2 Existing Environment

Topography

Midpen lands are located in the central portion the Coast Ranges geomorphic province. The province is characterized by northwest-trending mountain ranges and valleys that are nearly parallel to the San Andreas Fault. The Pacific Ocean lies to the west and the Great Valley lies to the east of the province.

The topography of Midpen lands include a variety of terrain features and geomorphology, including steep slopes and narrow canyons along the crest of the Santa Cruz Mountains, rolling hills and terraces downslope in the western foothills of the Santa Cruz Mountains that drain into the Pacific Ocean, and rolling hills and valleys downslope in the eastern foothills of the Santa Cruz Mountain that drain into the Santa Clara Valley and San Francisco Bay Estuary. Topographic relief in Midpen lands varies, and elevations reach up to 3,400 feet above sea level (Midpen, 2020). Level topography occurs in Ravenswood OSP and Stevens Creek Shoreline Nature Study Area, which are flat-lying and where elevations are less than two feet above sea level.

Geology

The Coast Ranges are characterized by elongate topographic and lithologic strips or blocks underlain by discrete basement rocks separated by structural boundaries or fault zones. Due to the San Andreas Fault and other faulting, the bedrock of Midpen lands is broken up into different blocks from different periods and epochs. Volcanic rocks, sedimentary rocks, and sediments are the major overlying rocks within Midpen lands. Volcanic rocks are primarily from the Miocene or Oligocene Epoch, sedimentary rocks are from the Pliocene, Miocene, Oligocene or Eocene Epoch, and sediments are from the early Pleistocene or Pliocene Epoch. Two main basement complex rocks underlie Midpen lands: the Franciscan Complex of mélange, sedimentary, and volcanic rocks and the Great Valley complex of sedimentary and volcanic rocks (Norris & Webb, 1976). Surficial sediments from the Holocene, early Pleistocene, and Pleistocene Epochs overlie the basement rocks (Graymer, et al., 2006). The prominent geologic units in Midpen lands are described in Table 4.6-2 and the general geologic types (surficial sediments, overlying rocks, basement complex rocks) are shown in Figure 4.6-1.

Soils

Soil Types and Characteristics

Over 100 unique soil types can be found across Midpen lands. Upland soils predominate in the Santa Cruz Mountains and foothills, where the terrain is characterized by steep slopes and canyons partially covered by sandy to gravelly loams with intermixed silt and clay. In the foothills of the Santa Cruz Mountains and further downslope in the lowlands and valleys, soils tend to be finer grained and dominated by silty loams and clayey loams. These soils transition into fine-grained clayey silty soils or bay mud along the San Francisco Bay Estuary. Surficial soils in the Santa Cruz Mountains and foothills of San Mateo and Santa Clara counties are susceptible to erosion by wind and water, notably in areas of topographic relief and steep terrains common in the uplands (NRCS, 2020).

Expansive Soils

Expansive soils possess a "shrink–swell" characteristic, which is defined as the cyclic change in volume, via expansion and contraction, which occurs in fine-grained clay sediments during wetting and drying. Structures constructed upon expansive soils may incur damage over long periods of time, usually because of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Expansive soils are not likely present throughout most of Midpen lands because surficial soils are primarily sandy loams (USDA, 1917; USDA, 1991; USDA, 2015; Helley & Lajoie, 1979). Expansive soils may be present in Ravenswood OSP and Stevens Creek Shoreline Nature Area where saturated bay mud occurs.

Serpentine Soils

The nutrient and trace metal content within serpentine soils is unique compared to other soils. Serpentine soils have low amounts of calcium, high amounts of magnesium, and relatively high concentrations of heavy metals in combination with low levels of nitrogen and poor nitrogen uptake (USFS, 2018). Serpentine soils underlie portions of Sierra Azul, El Sereno, Monte Bello, and St. Joseph's Hill OSPs and affect the vegetation communities that grow in those areas.

Many plants that grow in serpentine soils are rare, and serpentine environments support a number of endemic or nearly endemic species (USFWS, 1998). Naturally occurring asbestos refers to asbestos mineral as a natural component of soils or rocks. Ultramafic rocks may contain asbestos or asbestos-like materials. Ultramafic rocks occur in San Mateo County and western Santa Clara County and may occur within Midpen lands (Department of Conservation, 2020). Serpentine rock formations are shown in Figure 4.6-2.

Geologic and Soil Hazards

Soil Erosion

Erosion is the process by which rocks, soil, and other land materials are abraded or worn away from the Earth's surface over time by physical forces such as rainfall, flowing water, wind, or anthropogenic agents. The erosion rate depends on factors such as geologic parent material, soil type, slope, soil placement, vegetation, and human action. Erosion potential generally is higher in areas with steep slopes and for granular soils. Erosion potential also increases when vegetation is removed and soils are thereby loosened.

Potential sources of erosion within Midpen lands include channel incision below culvert crossings, washouts associated with trail-drainage crossings, along existing trails, associated with runoff from unpaved parking areas, and associated with culvert crossings. Midpen's Resource Management Policies and IPMP BMPs identify several actions and protective measures to reduce erosion within Midpen lands, such as the application of erosion control materials, road and trail management, and prevention of the invasive species introduction.

Slope Failure and Landslides

A landslide refers to the downslope movement of materials such as rock, soil, or fill under the direct influence of gravity. This downward movement can occur along what is known as a geologic failure surface (e.g., glide plane, landslide plane, or discrete slip surface) or without a distinct failure surface. The presence of landslides is due to several influences and factors related to slope stability, including slope angle, weathering, climate, water content, vegetation, overloading, erosion, earthquakes, and human-induced factors. The interrelationship of these factors creates a dynamic equilibrium in which slopes are subjected to constant changes over time. The potential threat of a significant number of failures occurring at the same time is greatest during strong seismic shaking or during intense rainfall events.

Ground shaking during an earthquake can also trigger landslides, especially under saturated conditions. Landslides are caused by the interacting dynamics of the factors discussed above, but they are usually triggered by forces that disrupt slope equilibrium. The most common landslide type encountered in Midpen lands is a debris flow, which is a significant erosional process on hillsides over time (Ellen, Mark, Wieczorek, Ramsey, & May, 1997). Debris flows are fast-moving downslope flows of mud that may include rocks, vegetation, and other debris. These flows typically begin during intense rainfall as shallow landslides on steep slopes. Depending on the scale and location, rapid movement and sudden arrival of debris flows following a triggering rainfall can pose a significant threat to life and property. Debris-flow initiation requires steep slopes and often concave parts of hillsides.

However, concavity is not always the case as they can occur in other slope conditions and in man-made slopes. Because debris flows move downslope and downstream from source areas, they can threaten property far from source areas. Potentially hazardous conditions exist near the base of steep hillsides as well as near the mouths of steep hillside drainages and locations in and near the mouths of canyons that drain steep terrain. Figure 4.6-3 shows the portion of the landscape where evidence of historic landslides within Midpen lands was identified. This data is used to predict where future landslides could occur. Areas where slopes are under 35 percent have the lowest potential for landslides and areas with slopes greater than 50 percent have the highest potential for landslides (McClelland, et al., 1998). Areas within OSPs where slopes are 35 percent or greater are shown in Figure 4.6-4.

Faults and Seismicity

The San Francisco Bay Region is considered a region of high seismic activity due to a network of active and potentially active faults associated with the San Andreas Fault (Norris & Webb, 1976). The San Francisco Bay Region is situated near the boundary between two major tectonic plates: the Pacific Plate to the southwest and the North American Plate to the northeast. Since the Miocene Epoch (approximately 23 million years ago), about 200 miles of right-lateral movement has occurred along the San Andreas Fault Zone to accommodate the relative movement between these two plates. The Pacific Plate and North American Plate move past each other along the San Andreas Fault Zone. The movement between the Pacific Plate and North American Plate generally occurs across a 50-mile-wide zone, extending from the San Gregorio Fault Zone along the San Mateo County coastline to the Great Valley Thrust Belt in the Great Valley. In addition to the right-lateral slip movement between the two tectonic plates, portions of the North American Plate have moved toward each other during the last 3.5 million years, resulting in compressional forces in the San Francisco Bay Region.

Risk of fault rupture on California's mapped faults has been assessed by the California Department of Conservation under the Alquist-Priolo Earthquake Fault Zoning Act. An active fault is one where there is geological evidence of movement within the current Holocene Epoch, within approximately the last 11,000 years. A potentially active fault is one where there is geological evidence of movement during the current Quaternary Period, within approximately the past 1.6 million years. The San Andreas, Hayward, Monte Vista, Rodgers Creek, Calaveras, Sargent, Green Valley, and San Gregorio faults are examples of active faults and all form part of the San Andreas Fault system, which accommodates predominantly lateral movement between the Pacific and North American Plates. Portions of Midpen lands, namely Sierra Azul, Bear Creek Redwoods, Saratoga Gap, Monte Bello, and Los Trancos OSPs, are crossed by active faults and fall within an earthquake fault zone (CGS, 2005; CGS, 2002; CGS, 2019).

An earthquake is classified by the amount of energy released, expressed as the magnitude of the earthquake (Mualchin, 1996). Until relatively recently, magnitudes have been quantified using the Richter scale; however, seismologists now use a moment magnitude scale because it provides a more accurate measurement of the size of major and great earthquakes. Moment magnitude is directly related to the average slip and fault-rupture area.

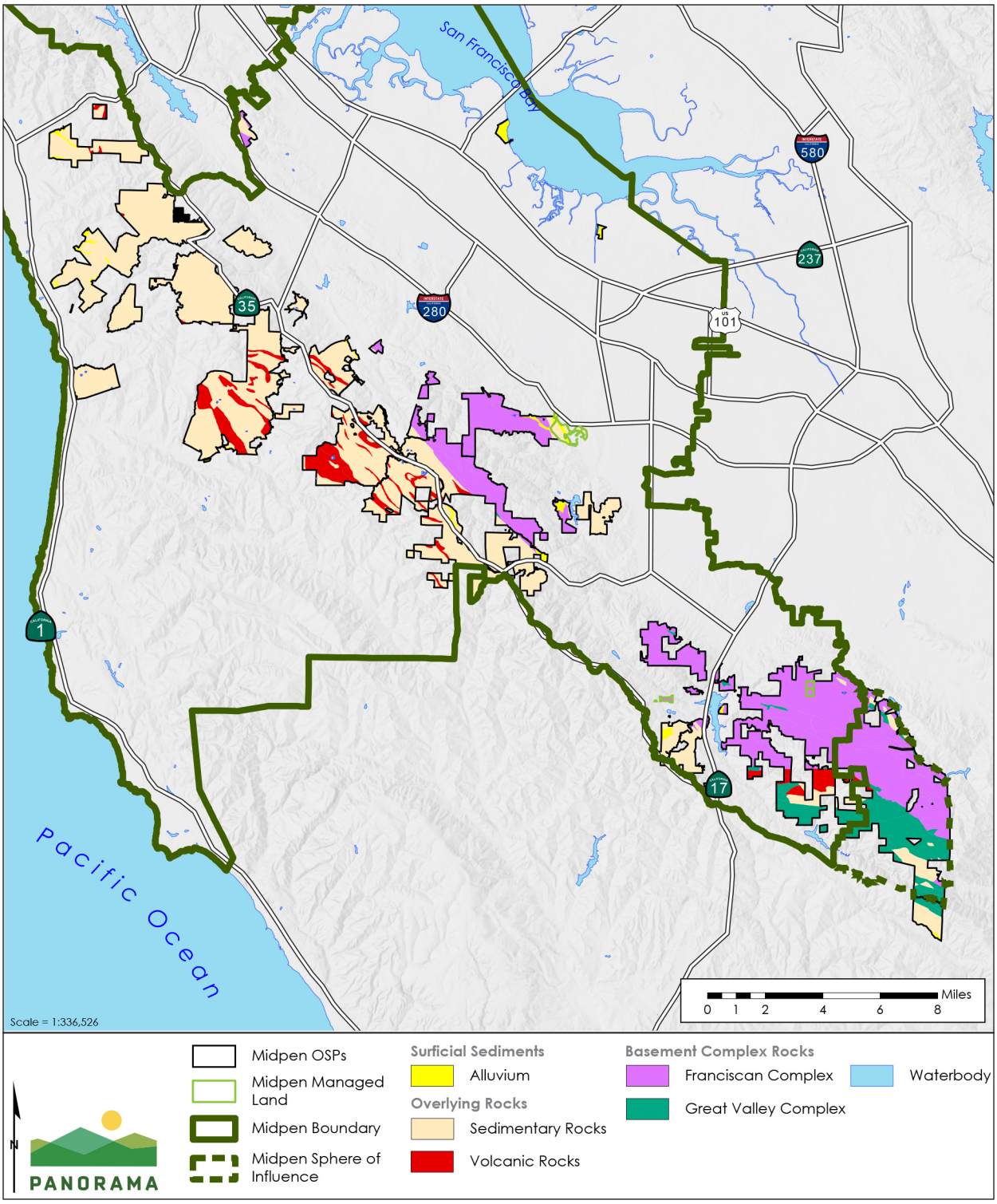
Table 4.6-2 Geologic Units Within Midpen Lands

Geologic Unit	Geologic Time of Formation	Geologic Description	Proximity to Midpen Lands
Surficial Sediments			
Alluvium	Holocene or Pleistocene Epochs	Alluvium consists of unconsolidated deposits of clay, silt, sand, and gravel that have been transported and deposited by streams. Within the lowland areas and at the base of slopes in the Program area, bedrock is overlain by younger surficial deposits. Alluvium is found at the margins of the hillside areas. The youngest deposits are loose and soft sediments deposited within the last 10,000 years. These deposits are typically those that are the most susceptible to landslides and slope instability.	Alluvium is dispersed throughout Midpen lands east of the San Andreas Fault Zone on the bayside of San Mateo and Santa Clara Counties.
Overlying Rocks			
Sedimentary rocks	Pliocene, Miocene, Oligocene, or Eocene Epochs	Sedimentary rocks are formed by subsequent accumulations of sediments that have been buried over time. As sediments are buried, the weight of overlying material exerts pressure, causing compaction of the sediments into sedimentary rocks. The remains of plants and animals get caught up in these accumulations to form fossils, which are found only in sediments and sedimentary rocks.	Overlying sedimentary rocks are well-dispersed throughout Midpen lands. A substantial amount of overlying sedimentary rocks can be found in Bear Creek Redwoods, El Corte de Madera Creek, La Honda Creek, and Purisima Creek Redwoods OSPs.
Volcanic rocks	Miocene or Oligocene Epochs	Volcanic rocks are formed from igneous rocks, which originate as extremely hot melted rock below the Earth's surface. Hot, melted rock rises to the surface and explodes to form volcanic rocks. Types of volcanic rocks include basalt and obsidian.	Overlying volcanic rocks are found within several OSPs. The majority of overlying volcanic rocks are located in Russian Ridge and La Honda Creek OSPs.
Basement Complex Rocks			
Franciscan Complex mélange, Franciscan Complex sedimentary rocks, and Franciscan Complex volcanic rocks	Eocene or Paleocene Epochs, Late Cretaceous Period, or Late Jurassic Period	The Franciscan Complex is Cretaceous- and Jurassic-age bedrock that has been broken and sheared by tectonic forces. The result is a disrupted mass of hard rock types embedded in a fine-grained matrix that has been sheared and crushed. The Franciscan Complex is characteristically inherently weak and pervasively sheared. The	The Santa Cruz Mountains are composed primarily of Franciscan assemblage. A significant amount of Franciscan Complex is found in

Geologic Unit	Geologic Time of Formation	Geologic Description	Proximity to Midpen Lands
		common massive sandstone, thinly bedded sandstone, butano sandstone, and shale bedrock in the Franciscan complex generally exhibits high stability on natural slopes. However, these rocks produce sandy and/or silty soils prone to erosion. They are also highly susceptible to erosion when stripped of their vegetative cover.	Sierra Azul, Monte Bello, and Rancho San Antonio OSPs.
Great Valley complex serpentinite, Great Valley complex plutonic rocks, Great Valley complex volcanic rocks, and Great Valley complex sedimentary rocks	Cretaceous or Jurassic Periods	The Great Valley complex is also Cretaceous- and Jurassic-Period bedrock, primarily comprised of shale and sandstone. The Great Valley complex rocks exhibit similar characteristics to the Franciscan Complex and are also prone to erosion. Serpentinite is a unique rock in that it contains almost no aluminum and other minerals that are abundant in many other rocks and clays; such as potassium, sodium, calcium and phosphorous. This rock slowly weathers and the soils derived from this rock are generally very thin.	The Great Valley complex primarily occurs on the eastern side of the San Andreas Fault and large deposits can be found within Sierra Azul and Monte Bello OSPs.

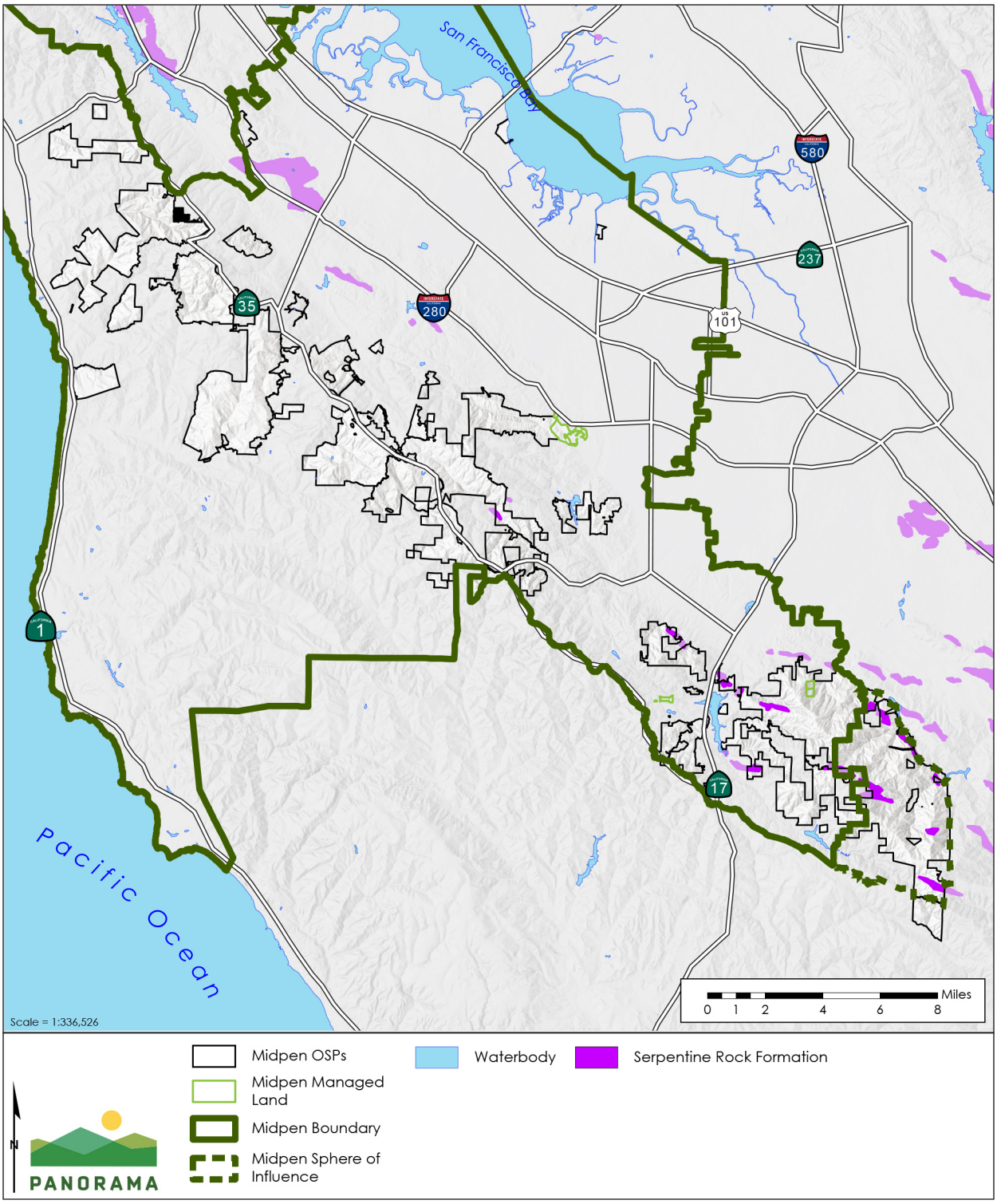
Sources: (Norris & Webb, 1976; DWR, 2016; Brabb, E.E.; Pampeyan, E. H., 1972; Brabb & Pampeyan, 1983; Brabb, E.E., 1980; Brabb, E. E.; Graymer, R. W.; Jones, D. L., 1998; Midpen, 2012; Lajole, Helley, Nichols, & Burke, 1974; Brabb, Graymer, & Jones, 1998; Graymer, et al., 2006)

Figure 4.6-1 General Geologic Types Within Mdpen Lands



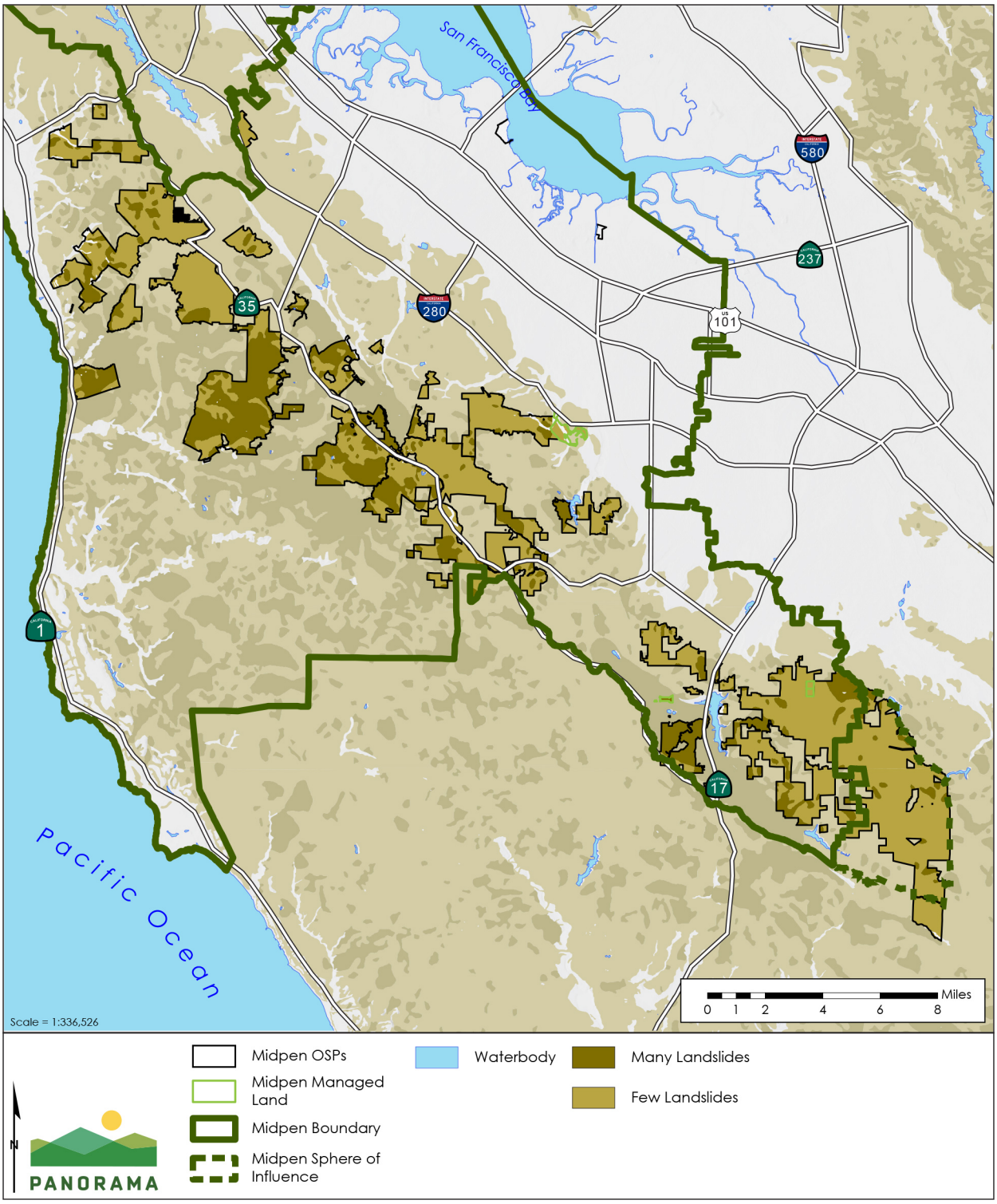
Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; USGS, 2005)

Figure 4.6-2 Serpentine Rock Within and Surrounding Midpen Lands



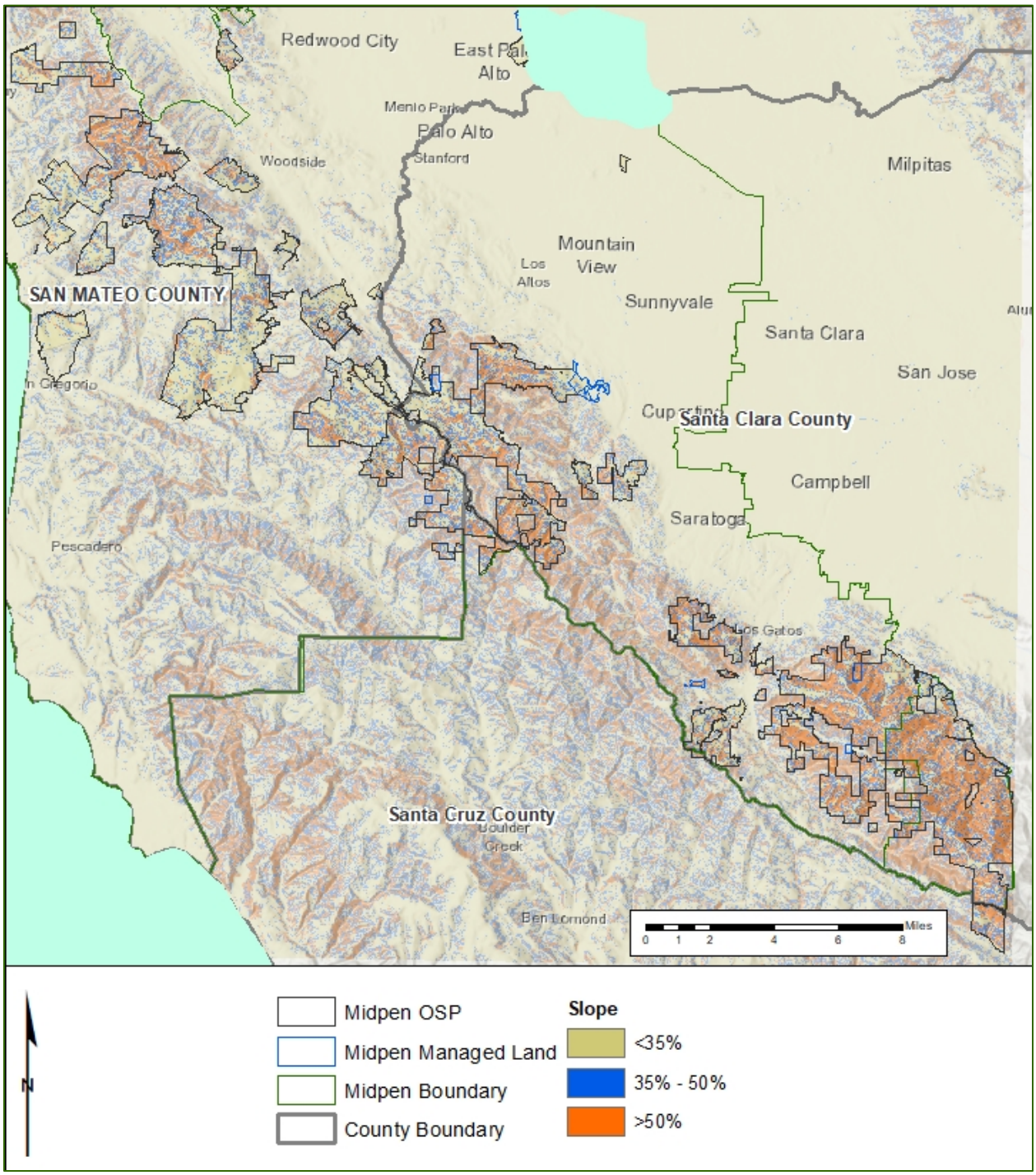
Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; USGS, 2005)

Figure 4.6-3 Historic and Projected Landslides Within Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; USGS, 1997)

Figure 4.6-4 Areas with Steep Slopes and Highest Potential for Slope Instability Within Midpen Lands



Source: (USGS, 2020)

Table 4.6-3 lists the principal faults in the San Francisco Bay Region, provides the maximum credible earthquake (MCE), or the largest earthquake likely to occur within the geologic framework, and the distance from faults to the nearest OSP. Major seismic activity on any of these faults could cause substantial ground shaking in the OSPs similar to that experienced during the 1989 Loma Prieta earthquake and the 1906 San Francisco earthquake.

Table 4.6-3 Regional Faults and Seismicity Surrounding Midpen Lands

Fault	MCE Magnitude	Distance to Nearest OSP
San Gregorio Fault Zone	7.5 to 7.8	4.5 miles
San Andreas Fault Zone	7 to 8	0 mile
Monte Vista-Shannon Fault Zone	6.5	2 miles
Hayward Fault Zone	7.5	15 miles
Hunting Creek-Berryessa Fault Zone	6.75	9 miles
Rodgers Creek Fault Zone	7.0	45 miles
Sargent Fault Zone	6.75	28 miles
West Napa Fault Zone	6.5	45 miles
Zayante-Vergales Fault Zone	7.25	30 miles
Calaveras Fault Zone, Central	7.5	15 miles
Green Valley Fault	6.75	42 miles
Greenville Fault Zone	7.25	34 miles

Source: (Mualchin, 1996; Weber & Cotton, 1980)

Liquefaction

Liquefaction is a phenomenon in which poorly compacted, saturated sediments temporarily lose their bearing strength and stiffness, such as during a ground-shaking event induced by earthquakes. Liquefaction occurs when unconsolidated or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. Poorly consolidated saturated soils and fill materials are most susceptible to liquefaction. The California Geological Survey (CGS) has mapped areas in San Mateo and Santa Clara counties that are considered to be subject to liquefaction from seismic ground shaking. Regions of the Program area are subject to potential liquefaction, such as Ravenswood and Stevens Creek Shoreline Nature Study Area OSPs (CGS, 2005; CGS, 2002; CGS, 2019; USGS, 2000). A potential consequence of seismically induced liquefaction along a creek channel is lateral spreading and bank failure toward the channel. Lateral spreading is the horizontal movement of relatively flat-lying sediment toward an open or "free" face such as a body of water, channel, or excavation.

Paleontological Resources

Definitions

Paleontological resources—or fossils—are the remains of ancient plants and animals that can provide scientifically significant information about the history of life on Earth. Scientifically significant fossils consist of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or pre-dating the middle Holocene Epoch (i.e., older than about 5,000 radiocarbon years) (SVP, 2010).

Paleontological "sensitivity" is defined as the potential for a geologic unit to produce scientifically significant fossils. This sensitivity is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities that are recorded from that unit. Paleontological sensitivity is assigned based on fossil data collected from the entire geologic unit, not just at a specific site. Paleontological resources are non-renewable because they are the remains of prehistoric animal and plant life.

A three-fold classification of sensitivity, labeled as high, low, and indeterminate, is used in California and recommended by the Society of Vertebrate Paleontology (SVP, 2010) as follows:

- **High Sensitivity.** Indicates fossils are currently observed on site, localities are recorded within the study area, and/or the unit has a history of producing numerous significant fossil remains.
- **Low Sensitivity.** Indicates significant fossils are not likely to be found because of a random fossil distribution pattern, extreme youth of the rock unit, and/or the method of rock formation, such as alteration by heat and pressure.
- **Indeterminate Sensitivity.** Unknown or undetermined sensitivity indicates that the geologic unit has not been sufficiently studied or lacks good enough exposure to warrant a definitive rating. An experienced, professional paleontologist can often determine whether the stratigraphic unit should be categorized as having high or low sensitivity after reconnaissance surveys, including observations of road cuts, stream banks, and possible subsurface testing, such as augering or trenching.

Data Collection

A review of relevant literature, maps, and databases was undertaken to determine the likelihood of encountering paleontological resources. The following resources were used in this study:

- Geologic map of the San Francisco Bay Region (Graymer, et al., 2006)
- Stratigraphy, Paleontology, and Geology of the Central Santa Cruz Mountains, California Coast Ranges (Clark, 1981)
- Preliminary Geologic Description of the San Jose 30 X 60 Minute Quadrangle California (Wentworth, Jr., McLaughlin, & Graymer, 1999)

Potential for Paleontological Resources in the Program Area

The characteristics of a geologic unit, including age and method of formation, determines the potential for presence of paleontological resources and type of resources. The Santa Cruz Mountains are composed primarily of Franciscan Complex sandstone, shale, chert, and serpentine. The Franciscan Complex was deposited originally in a deep marine trench off the California Coast. As a result of convergence of the Pacific and North American plates, those sediments were folded, faulted, and accreted onto the continental margin, forming the Coast Ranges. During the Tertiary Period, marine and non-marine sediments were deposited in portions of the Coast Ranges (Santa Clara County, 1994). The types of fossils found in geologic formations of the Santa Cruz Mountains are typically marine vertebrates and invertebrates (e.g., mollusks, gastropods), with some plants (Wentworth, Jr., McLaughlin, & Graymer, 1999; Clark, 1981).

Some of the oldest rocks in the San Mateo County portion of Midpen lands belong to the Franciscan Complex, formed some 150 to 90 million years ago as the Farallon Plate was subducted under the North American Plate. Many of the soils within this area are developed on sedimentary rocks and consist of sandy loam and silt loam surface layers over silty clay and silty clay loam subsoils (Midpen, 2014a). The potential to find fossils within the Franciscan Complex and Great Valley complex is rare, as the formations are heavily deformed and metamorphosed in many locations.

Pleistocene Epoch or older (older than 11,000 years) continental sedimentary deposits are considered as having a high paleontological potential while Holocene-Epoch deposits (less than 10,000 years old) are generally considered to have a low paleontological potential because they are geologically immature and are unlikely to have fossilized the remains of organisms. Metamorphic and igneous rocks have a low paleontological potential, either because they formed beneath the surface of the earth (such as granite) or because they have been altered under high heat and pressures, chaotically mixed or severely fractured. Generally, the processes that form igneous and metamorphic rocks are too destructive to preserve identifiable fossil remains. Geologic units and associated paleontological sensitivity within Midpen lands are identified in Table 4.6-4. The vast majority of the OSPs and Midpen lands have low sensitivity for paleontological resources, except Sierra Azul and Rancho San Antonio OSPs, which contain the majority of the Pleistocene alluvium deposits within Midpen lands.

Table 4.6-4 Major Geologic Units and Paleontological Sensitivity Within Midpen Lands

Geologic Unit	Geologic Time of Formation	Paleontological Sensitivity	OSPs Containing Majority of Unit
Surficial Deposits			
Alluvium	Holocene or Pleistocene Epochs	Moderate Sensitivity	• Sierra Azul • Rancho San Antonio • Miramontes Ridge (Holocene only)

Geologic Unit	Geologic Time of Formation	Paleontological Sensitivity	OSPs Containing Majority of Unit
Overlying Rocks			
Sedimentary rocks	Pliocene, Miocene, Oligocene, or Eocene Epochs	Moderate Sensitivity	• Bear Creek Redwoods • El Corte de Madera Creek • La Honda Creek • Purisima Creek Redwoods
Volcanic rocks	Miocene or Oligocene Epochs	Low Sensitivity	• Russian Ridge • La Honda Creek
Basement Rocks – Franciscan Complex			
Mélange	Eocene or Paleocene Epochs or Late Cretaceous Period	Low Sensitivity	• Sierra Azul • Monte Bello • Rancho San Antonio • El Sereno
Volcanic rocks	Cretaceous or Jurassic Periods	Low Sensitivity	• Sierra Azul • Rancho San Antonio
Sedimentary rocks	Cretaceous or Jurassic Periods	Low Sensitivity	• Sierra Azul • El Sereno
Chert	Cretaceous or Jurassic Periods	Low Sensitivity	• Sierra Azul
Basement Rocks – Great Valley Complex			
Serpentinite	Jurassic Period	Low Sensitivity	• Sierra Azul
Plutonic rocks	Jurassic Period	Low Sensitivity	• Sierra Azul
Volcanic rocks	Jurassic Period	Low Sensitivity	• Monte Bello • Sierra Azul
Sedimentary rocks	Cretaceous or Jurassic Periods	Low Sensitivity	• Sierra Azul

Source: (Graymer, et al., 2006)

4.6.3 Regulatory Setting

Federal

No federal programs or policies addressing slope stability, landslides, and erosion pertain to the analysis of geology and soils impacts for the Program.

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. Any structure expected to have a human

occupancy rate of more than 2,000 person-hours per year is considered a structure for human occupancy by the State Mining and Geology Board. In accordance with this act, the State geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. Several earthquake fault zone maps have been prepared that cover the Program area.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking and other hazards caused by earthquakes. This act requires the State Geologist to delineate "zones of required investigation" (i.e., seismic hazard zones), where site investigations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslides. Several zones of required investigation cover the Program area (CGS, 2002; CGS, 2005; CGS, 2019).

Local

Midpeninsula Regional Open Space District – Resource Management Policies

Midpen's resource management policies include regulations for management of natural, cultural, and agricultural resources. These policies are used by Midpen to manage its various lands and open spaces, including those that are a part of this Program. Midpen recognizes the protection of geologic and soil resources as one of the primary benefits of open space (Midpen, 2014b). The following goal and policies relate to geology and soils:

Goal GS Avoid or minimize soil loss and prevent or remediate contamination related to human land use; protect unique or exceptional geologic features.

Policy GS-1 Locate and construct facilities to avoid high-risk areas subject to landslides, liquefaction, faulting, flooding and erosion.

Policy GS-2 Minimize unnatural soil erosion and sedimentation.

Policy GS-3 Protect unique or exceptional geologic features from human damage.

San Mateo County General Plan

Midpen lands included in this Program within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals and objectives related to Soil Resources Policies in the San Mateo County General Plan are applicable to the Program (San Mateo County, 2013). Refer to Section 4.4: Cultural and Tribal Cultural Resources for other applicable goals and objectives.

2.1 **Protect and Preserve Soil as a Resource.** Protect and preserve the availability and quality of soil as a resource for its ability to sustain healthy plant, animal, and human life within San Mateo County.

2.2 **Minimize Soil Erosion.** Minimize soil erosion through application of appropriate conservation practices.

2.3 **Prevention of Soil Contamination.** Prevent soil contamination through the appropriate use, storage, and disposal of toxic substances.

2.4 **Protection of Productive Soil Resources.** Protect productive soil resources from abuse, misuse, and degradation.

2.5 **Minimize Depletion of Productive Soil Resources in Agricultural Areas.** Minimize depletion of productive soil resources in agricultural areas through application of appropriate management practices.

Santa Clara County General Plan

Midpen lands included in this Program within Santa Clara County are subject to the stipulations outlined in the Santa Clara County General Plan. The Safety and Noise Chapter of the Santa Clara General Plan includes policies providing guidelines related to geology and soils (Santa Clara County, 1994). The policies that may apply to the Program are listed below:

R-HS 19 In areas of high potential for activation of landslides, there shall be no avoidable alteration of the land or hydrology which is likely to increase the hazard potential, including:

1. Saturation due to drainage or septic systems;
2. Removal of vegetative cover; and
3. Steepening of slopes or undercutting the base of a slope.

R-HS 21 Proposals involving potential geologic or seismic hazards shall be referred to the County Geologist for review and recommendations.

Santa Cruz County General Plan

Midpen lands included in this Program within Santa Cruz County are subject to the stipulations outlined in the Santa Cruz County General Plan. Chapter 5, Conservation and Open Space, of the Santa Cruz County General Plan contains the following geological resources policies that are applicable to the Program (Santa Cruz County, 1994):

5.9.1 **Protection and Designation of Significant Resources**. Protect significant geological features such as caves, large rock outcrops, inland cliffs and special formations of scenic or scientific value, hydrological features such as major waterfalls or springs, and paleontological features, through the environmental review process.

5.9.2 **Protecting Significant Resources Through Easements and Land Dedications**. Encourage and obtain where possible Open space Easements or other forms of land dedication to conserve as open space those areas containing hydrological, geological or paleontological features of significant scenic or scientific value.

4.6.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on geology, soils, and paleontological resources would be considered significant if they would exceed the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - Strong seismic ground shaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the proposed plan, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), or a corrosive soil creating substantial direct or indirect risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

(See CEQA Guidelines, Appendix G, I.)

Analysis Methodology

The analysis presented in this section was performed using qualitative and comparative methods that involved identifying the areas where soil erosion and landslide hazards could occur and identifying the potential for various management actions to destabilize slopes, resulting in localized landslides or soil erosion in those areas. Mitigation is identified, as appropriate, to reduce impacts to less-than-significant levels.

4.6.5 Impact Analysis

Impact Geology and Soils-1: Directly or indirect substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; ii) Strong seismic ground shaking; iii) Seismic-related ground failure, including liquefaction; or iv) Landslides.	Significance Determination
	Less than significant

Midpen lands traverse several counties and are subject to compliance with various local laws and ordinances concerning geology and soils, including the San Mateo, Santa Clara, and Santa Cruz County General Plans. Midpen adheres to these local regulations when managing its lands that fall into those respective jurisdictions and would continue to do so when implementing the Program. Midpen also has specific regulations for the management of its lands that involve Program activities, as outlined in Midpen's Resource Management Policies. The Program area features several earthquake faults susceptible to rupture and historically has experienced strong seismic ground shaking, such as during the 1989 Loma Prieta earthquake. The Alquist-Priolo Earthquake Fault Zoning Maps for the Program area indicate that Midpen lands are located within earthquake fault zones and are also designated as zones of required investigation under the Seismic Hazards Mapping Act (CGS, 2002; CGS, 2005; CGS, 2019).

An impact is only considered significant if the Program would exacerbate existing or future seismic hazards by increasing the severity or likelihood of such hazards affecting people that would exist without the project. The number of workers on Midpen lands at any one time and throughout the year would increase under the Program. Workers may be at risk of injury or death from various Program activities if activities are conducted in an area where fault rupture, seismic-related ground failure, or landslide occur; however, seismic ground shaking events are unpredictable, and the potential occurrence of such events coinciding with Program activities is minimal. Earthquake safety training pursuant to Occupational Safety and Health Administration regulations would minimize potential for impacts on workers. The Program involves implementation of various vegetation management activities and does not include any substantial new structures or operational activities that could create or exacerbate a ground-shaking risk to the surrounding population. The Program would not involve construction of habitable structures that could expose persons to adverse effects from earthquakes and strong seismic ground shaking. Implementation of Program activities would not cause an increased risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, or seismic-related ground failure, including liquefaction and landslides. The impact would be less than significant. Refer to Impact Geology and Soils-3 for an analysis of the potential for the Program to increase landslide risk and soil destabilization.

	Significance Determination
Impact Geology and Soils-2: Substantial soil erosion or the loss of topsoil.	**Less than significant with mitigation**

Overview

The Program area is underlain by a variety of surficial soil units susceptible to erosion. Implementation of the Program would include actions that could cause erosion and loss of topsoil through removal of vegetation covering slopes and exposing bare soil and through the removal of plants by the root systems that bind soil, particularly on slopes. Erosion could degrade soils nutrient levels, could reduce habitat sustainability, and could result in downstream sedimentation, which could have an adverse impact on downstream waters.

Analysis of Tools and Techniques

Manual and Mechanical Techniques, and Chemical Application

Soil erosion and loss of topsoil could occur during manual and mechanical vegetation removal through the exposure of bare soils and after the work is completed, erosion and topsoil loss could occur through loss of root-soil matrix strength if root systems die. As discussed in Section 4.6.2: Existing Environment, many different soil types are found on Midpen lands. Each soils unit is unique to the combination of climate, plants and animals, relief (elevation and slope), parent material, and time. In some cases, habitat for special-status plants and sensitive plant communities are restricted to very specific soil types. An example is the serpentine-derived soils present in Sierra Azul, El Sereno, Monte Bello, and St. Joseph's Hill OSPs. Serpentine-derived soils are deficient in aluminum and are important for serpentine grasslands, chaparral, woodlands, and barrens. Substantial disturbance of these specific soil types would reduce their ability to support sensitive habitats. Loss of topsoil in other areas may also result in reduced capacity for the soils to regenerate native and diverse growth.

Pile burning is conducted as part of current vegetation management practices. No new erosion and topsoil loss impacts would occur as a result of pile burning. Piles are localized and relatively small in size and generally would not result in burn scars over any areas significant enough to result in increased erosion.

Several manual and mechanical methods for vegetation removal would result in ground disturbance of at least the top layer of soil, which could result in erosion and loss of topsoil. These include the following:

- Pulling, cutting, or scalping of plants with heavy equipment
- Pulling of plants by hand or using hand tools such as shovels

Use of these methods that maintain at least 70 percent of groundcover would not result in a significant impact (Lang & McDonald, 2005). In the event groundcover is significantly reduced (i.e., less than 70 percent vegetative cover remains), impacts from erosion and loss of topsoil would be potentially significant. IPMP BMP 28 requires implementation of erosion control

measures before or after vegetation treatment near sites with loose or unstable soils, on steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment. Erosion control measures could consist of the application of forest duff or mulches, straw bales, straw wattles, or other erosion control material or seeding or planting of appropriate native plant species to control erosion, restoring natural areas, and preventing the spread or reestablishment of weeds. Impacts from mechanical and manual methods of vegetation removal would be less than significant with implementation of existing IPMP BMP 28.

Prescribed Herbivory

Prescribed herbivory has the potential to result in substantial erosion and loss of topsoil. Livestock have a preference to use established trails to travel throughout steep areas and to travel between key points (e.g., water source and grazing area) that are far away. Livestock trails could cause bare areas with the potential to increase erosion and loss of topsoil. Grazing animals tend to wallow and trample, which all loosen topsoil. The impact from livestock trails and prescribed herbivory on erosion and loss of topsoil would be potentially significant. IPMP BMP 28 requires implementation of erosion control techniques for areas at risk of erosion and loss of topsoil, which would reduce impacts across a large area. MM Geology-1 would reduce impacts by requiring implementation of design features to minimize creation of livestock trails and congregation of livestock in any one location, the use of appropriate numbers of livestock as determined via the stocking rate equation, and remediation of bare soils after work is completed. Prescribed herbivory areas would not cross any waterbodies, such as lakes/reservoirs, streams, creeks, riparian areas, or wetlands. The impact would be less than significant with mitigation.

Prescribed Burning

Prescribed burns would require fire lines that are linear areas clear of vegetation and wide enough to contain the fire to the intended burn area. Fire lines, if created just for the purpose of the prescribed burn, would result in additional denuded areas that are more prone to erosion. Prescribed burning would result in the removal of vegetation on the surface, increasing the potential for erosion in the burned area. Water-repellent soils can be created by moderate to severe fires (including prescribed burns). Storm water can then flow over the exposed soils and pick up silt and small soil particles, eroding the surface. Groundcover of less than 70 percent has been found to result in excessive runoff and erosion (Lang & McDonald, 2005). Prescribed burns that retain at least 70 percent of groundcover would not result in a significant impact. Prescribed burns, particularly in grasslands and on slopes of greater than 30 percent, could be large enough that the removal of vegetation and resultant exposed hydrophobic soil could result in a substantial increase in erosion and loss of topsoil, which would be a potentially significant impact. IPMP BMP 28 would minimize erosion and loss of topsoil in denuded areas by requiring use of erosion control measures. Implementation of MM Geology-2 would reduce impacts by requiring that prescribed burns be performed outside of perennial streams and intermittent streams, riparian forest, and woodlands and that a 50-foot buffer be maintained around perennial and intermittent streams when the prescribed burn is proposed upslope on

slopes greater than 30 percent to reduce impacts from erosion contaminating nearby riparian areas. MM Geology-3 would further reduce impacts by requiring the use of existing facilities for fire lines, implementation of erosion control measures during and after prescribed burns, follow-up inspections, and restoration actions for new fire lines. Impacts would be less than significant with mitigation.

Access and Vehicle Travel

Vehicle travel to project sites and within the Program area could result in some erosion. Most of the proposed fuelbreaks are located adjacent to and along the upslope and downslope side of roads. Defensible spaces are located near public areas, facilities, and utilities. These areas are accessed via roads. Vehicle travel and transport of equipment on established unpaved or gravel roadways and trails could result in erosion. Impacts on any one area from off-road travel would be limited because vehicle use would be dispersed throughout the Program area. The additional trips associated with implementation of the Program would not result in significant increases in erosion and loss of topsoil as most erosion occurs from the presence of the unpaved roads and trails versus the use of them. Former skid trails may be mowed and vegetation cleared for use to access areas beyond existing roads, such as to access forest treatment areas, but they would not be graded. Root systems of larger vegetation would generally be left in place, minimizing the potential for erosion from use of these roads. Impacts would be less than significant.

Analysis of Plans

Vegetation Management Plan

The maintenance of existing and creation of new VMAs would require the use of manual and mechanical equipment for vegetation removal. Soil erosion and loss of topsoil could occur during such vegetation management activities resulting in a significant impact. IPMP BMP 28 requires implementation of erosion control measures before or after vegetation treatment near sites with loose or unstable soils, steep slopes, where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment. Implementation of this BMP would minimize topsoil erosion. Use of prescribed herbivory as pre-treatment in some areas could result in erosion and loss of topsoil if new livestock trails are formed. MM Geology-1 would reduce impacts by requiring implementation of design features to minimize creation of livestock trails. Impacts would be reduced to less than significant with mitigation. Impacts associated with the VMP would be less than significant with implementation of mitigation.

Prescribed Fire Plan

Prescribed burns could result in a substantial increase in erosion and loss of topsoil due to removal of surface vegetation and alteration of soils. Prescribed burns may necessitate creation of new fire lines that could result in additional denuded areas that are more prone to erosion. IPMP BMP 28 requires the installation of erosion control measures in areas with loose soils to minimize impacts from erosion as a result of vegetation removal. MM Geology-2 requires maintenance of a 50-foot buffer around perennial and intermittent streams when a prescribed burn is proposed on a slope greater than 35 percent and upslope of the stream to minimize

potential risk of erosion impacting nearby water bodies. MM Geology-3 requires prescribed burn boundaries to be designed to avoid gullies and highly erodible soils as well as restoration of fire lines that do not use existing infrastructure (e.g., roads, trails, or other permanent infrastructure). Implementation of mitigation would reduce impacts to less than significant.

Wildland Fire Pre-Plan

Use of vehicles and equipment during construction of spur roads, water storage tanks, staging and landing areas, and other firefighting infrastructure would require ground disturbance that could result in some increased erosion. Vehicle use would be dispersed throughout the Program area, therefore reducing the impact on any one area. Construction of facilities would require ground disturbance that could result in erosion and loss of topsoil. IPMP BMP 28 reduces erosion by requiring installation of erosion control measures such as application of forest duff or mulches, straw bales, straw wattles, or other erosion control material, or seeding or planting of appropriate native plant species to control erosion. Creation of spur roads or other infrastructure that requires clearing of vegetation could still result in substantial erosion depending upon the location, soil types, and soil moisture. MM Geology-2 requires avoidance of steep slopes, where feasible, and implementation of erosion control design measures and considerations to minimize potential risk of erosion, when constructing on steep slopes. Impacts be less than significant with mitigation.

	Significance Determination
Impact Geology and Soils-3: Instability of a geologic unit or soil that could potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.	**Less than significant with mitigation**

Overview

As described in Section 4.6.2: Existing Environment, Midpen lands are subject to instability. The Program would not involve water extraction that could lead to subsidence. While liquefaction and lateral spread has the potential to occur on Midpen lands due to the nearby faulting and presence of water saturated areas, Program activities would not exacerbate these conditions, such as by altering soil saturation or use of vibratory equipment. Soil collapse occurs when shrink-swell soils shrink during the dry season as well as where saturated soils are loaded or compressed. Conditions that could lead to soil collapse exist on Midpen lands, however Program activities would not involve construction of large facilities that could cause soil collapse. These concerns are not addressed further. Landslides are a significant geologic hazard found throughout the Program area. Due to the underlying topography and geology, landslides are a natural part of the landscape and are a continuous geologic process that creates unique landforms and hillside topography important to the ecological environments found on Midpen lands. Program-related alteration of the land may increase landslides, primarily through vegetation removal that can weaken soil matrix strength. Severe landslides can be devastating to the wildland environment by covering plants, knocking down or damaging trees, and upsetting habitat equilibrium. Landslides or debris flows can also damage infrastructure throughout or directly adjacent to Midpen lands, including roads, trails, and structures.

Significant alteration to hydrologic and groundwater conditions in some cases may decrease slope stability and result in landslides; however, the Program is not anticipated to create such conditions. Alteration to natural drainage courses is discussed in Section 4.8: Hydrology and Water Quality.

Many proposed VMAs are most likely underlain by, or near, preexisting landslide debris and/or cross-debris flow path locations. The proposed vegetation management actions that alter vegetative cover, expose soils, and/or minimize soil-root matrix strength could pose a significant impact related to ground stability and could create landslides. These impacts are discussed in detail in this section.

Analysis of Tools and Techniques

Manual and Mechanical Techniques, and Chemical Application

Slope steepness, soil and geologic unit type, vegetation, soil water content, and human action affect slope stability. Assessments conducted of landslides found that relatively few landslides occurred on slopes less than 35 percent even where anthropogenic activities such as logging or roads were present. Whereas the likelihood of a landslide occurring increased as slope increased with the highest rates on slopes of 46 to 50 percent or greater (McClelland, et al., 1998; Megahan, Day, & Bliss, 1978). Studies of landslides and forest management practices, including tree cutting (e.g., timber harvest), have found landslide rates to be significant due to loss of root strength (McClelland, et al., 1998). Most landslides that occur after tree removal can be attributed to reduced soil cohesion from root decay. The magnitude of decrease in soil cohesion depends on the existing level of slope stability, dependence on root systems for stability and density of vegetation in the area, and intensity of root system removal (e.g., removal of weeds over a large area versus spot removal) (Rice, Smith, & Strand, 1976). Many treatment areas are located along or near roads and/or trails, and the decreased slope stability could result in a greater landslide or debris-flow risk that could affect important infrastructure and habitats.

Trees would be removed at the base, and the stumps would be ground down to below the surface. The root systems of removed trees would be left intact to the greatest extent feasible, limiting the potential for soil erosion and slope destabilization. Loss of root strength has a direct effect on soil stability (Ziemer, 1981). The level at which retained roots reinforce soil stability is dependent upon soil type, slope, climate, health of the tree, and tree species. Landslide frequency often increases after tree removal but gradually decreases as the area revegetates. The rate at which roots lose strength after tree death has been studied in a variety of forest types. In North America, a 50-percent reduction in root reinforcement was observed to occur 14 to 66 months (just over 1 year to 5.5 years) after conifer tree removal, depending upon the species and other variables (O'Loughlin and Watson 1979). Conservatively, a loss of 50 percent root strength could be expected after a little more than a year after tree removal.

Program activities have the potential to be conducted in areas with steep slopes. Manual and mechanical methods of vegetation removal often include cutting or scalping of vegetation at the surface, thereby leaving roots intact, which would also minimize the potential for slope failure or landslides. Pulling includes the removal of trees or other large-scale areas of brush and

weeds by the roots. Herbicide use would lead to plant mortality but would typically be stump or spot spray. No broadcast spraying would occur, minimizing large swaths of dead plants that could lead to soil instability. Root systems increase the stability of slopes by acting as a cohesive force in soil and by reducing the moisture content of soils, which tends to reduce the possibility for landslides. Substantial slope failure could occur if intensive tree (e.g., eucalyptus) and understory removal or other clearing activity (e.g., for creation of spur roads) were conducted on steep slopes, which would be a significant impact if such a slope failure resulted in damage to structures, roads, trails, infrastructure, or habitat.

Midpen requires implementation of erosion control measures on sites with loose or unstable soils, on steep slopes, or where a large percentage of the groundcover will be removed (IPMP BMP 28). IPMP BMP 28 does not address all potential scenarios that may cause erosion leading to landslides, such as the use of heavy equipment on steep slopes. MM Geology-2 requires workers to avoid the use of heavy equipment on slopes greater than 35 percent unless specialized equipment is used that minimizes slope instability, and requires use of surface mounds, depressions, logs, rocks, trees and stumps, slash and brush, the litter layer, and native herbaceous vegetation downslope of denuded areas to reduce sedimentation and erosion, as is necessary to prevent erosion or slope destabilization. The measure also requires consideration of slope stability prior to conducting work that could result in denuded surfaces or long-term loss of roots that bind soil on slopes. Work in areas with high slope failure potential would be limited if a slope failure results in damage to roads, trails, structures, or habitat. Slope stabilization provisions would be implemented to minimize the likelihood of landslides during or after the work is completed. Implementation of IPMP BMP 28 as well as MM Geology-2, where applicable, would minimize the likelihood of landslides during or after Program activities are completed, reducing impacts to less than significant.

Prescribed Herbivory

Prescribed herbivory can result in the creation of livestock trails that could create bare areas of earth. Grazing animals also tend to wallow and trample, which all loosen topsoil. Overgrazing an area has the potential to cause bare soil. The impact on soil stability from prescribed herbivory would be potentially significant. MM Geology-1 requires implementation of design features to minimize creation of livestock trails, that the number of livestock in an area are controlled to prevent overgrazing, and that bare soils are remediated after work is completed. The impact would be less than significant with mitigation.

Prescribed Burning

Prescribed burning would result in the removal of vegetation on the surface. Soil instability could result through the loss of root strength as roots die from burns on steep slopes (i.e., greater than 35 percent). Temporary effects of hydrophobic soils could actually reduce the potential for landslides as it would prevent water from infiltrating the soil. In the interim between the time of a prescribed burn and new vegetative growth, a burned area on a slope may be subject to increased landslide potential. Impacts would be potentially significant were landslides to affect infrastructure or habitat; however, IPMP BMP 28 requires erosion control measures to stabilize the soils and reduce impacts to less-than-significant levels. If prescribed

burns are conducted near a water body, increased erosion could cause a landslide that may contaminate a water body and cause a potentially significant impact. MM Geology-2 requires a 50-foot buffer around perennial and intermittent streams when a prescribed burn is proposed on a slope greater than 35 percent and upslope of the stream to minimize risk of landslides impacting water quality. Fire lines, if created exclusively for the purpose of the prescribed burn, would result in denuded areas that are more prone to landslides as a result of vegetation removal. MM Geology-3 requires use of existing facilities (e.g., roads, trails, and wet lines) for fire lines where they occur or else implementing other erosion control measures, as defined in MM Geology-3, to restore fire lines that do not use existing facilities. Minimizing erosion would minimize slope stability issues. Impacts from prescribed burns would be less than significant with mitigation.

Access and Vehicle Travel

Access and vehicle travel would not have significant impacts on slope stability – primarily because the roads and access routes are already established. On-road travel from implementation of the Program would not result in significant increase in slope instability or landslides from use of the roads. Skid roads may be mowed to access areas beyond existing roads, such as to access forest treatment areas. These former logging skid roads would not be graded to bare soil; vegetation would be cut and downed trees removed, minimizing the potential for slope failures or landslides from these roads. Impacts would be less than significant.

Analysis of Plans

Vegetation Management Plan

VMAs would be created and maintained by cutting and mowing vegetation and by removing small trees, brush, and ladder fuels. The creation of new VMAs and maintenance of existing fuel reduction areas, ingress/egress routes, fuelbreaks, and disclines would result in plant root disturbance and exposed soils. New VMAs could be created in areas with steep or very steep slopes potentially increasing soil instability and landslide risk. Figure 4.6-4 identifies areas of the OSPs where slopes are greater than 35 percent and 50 percent, corresponding to areas of progressively greater risk. The following table summarizes where different types of potential VMAs could be implemented in areas of steep slopes within each OSP that pose the greatest risks of landslide and debris flow. While Table 4.6-5 indicates that new VMAs may be created in areas within steep slopes, in any one year only a comparatively small subset of new VMAs would be created of the total potential area for VMAs. For example, up to 20 acres of eucalyptus and acacia removal would occur in any one year (refer to Table 3.6-1 of Chapter 2: Project Description) even though a total of 44 acres of Miramontes Ridge OSP of eucalyptus and acacia groves are located on steep slopes.

Table 4.6-5 Potential VMAs with the Highest Risk of Slope Failure, by OSP

Managed Land	Type of VMA that May be Created on Steep Slopes	> 35% to ≤ 50% Slope (Acres)	> 50% Slope (Acres)
Bear Creek Redwoods OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	45.9	55.5
	Fire Management Logistics Areas	0.7	1.0
	Shaded Fuelbreaks	2.0	1.0
	Total	**48.6**	**57.5**
Coal Creek OSP	Fire Agency New Recommended Fuelbreaks	0.2	-
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	13.5	4.2
	Ingress/Egress Route Fuelbreaks	0.2	0.1
	Total	**13.9**	**4.3**
El Corte de Madera Creek OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	34.5	24.9
	Fire Management Logistics Areas	0.2	-
	Total	**34.7**	**24.9**
El Sereno OSP	Eucalyptus and Acacia Removal	0.1	-
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	18.7	15.6
	Fire Management Logistics Areas	2.1	0.9
	Ingress/Egress Route Fuelbreaks	11.6	9.3
	Total	**32.5**	**25.8**
Foothills OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	10.7	5.9
Fremont Older OSP	Eucalyptus and Acacia Removal	1.5	0.2
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	4.3	1.5
	Fire Management Logistics Areas	0.7	0.3
	Ingress/Egress Route Fuelbreaks	7.2	2.8
	Total	**13.7**	**4.8**
La Honda Creek OSP	Eucalyptus and Acacia Removal	0.1	0.1
	Fire Agency New Recommended Fuelbreaks	9.1	5.9

Managed Land	Type of VMA that May be Created on Steep Slopes	> 35% to ≤ 50% Slope (Acres)	> 50% Slope (Acres)
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	23.9	25.4
	Non-Shaded Fuelbreaks	0.3	-
	Shaded Fuelbreaks	0.8	0.2
	Ingress/Egress Route Fuelbreaks	12.0	2.4
	Total	**46.2**	**34.0**
Long Ridge OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	88.9	74.5
	Target Hazards Fuelbreaks	0.2	-
	Fire Management Logistics Areas	0.1	-
	Ingress/Egress Route Fuelbreaks	0.1	-
	Total	**89.3**	**74.5**
Los Trancos OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	2.3	0.2
	Non-Shaded Fuelbreaks	0.1	-
	Total	**2.4**	**0.2**
Miramontes Ridge OSP	Eucalyptus and Acacia Removal	27.1	17.3
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	1.1	1.6
	Ingress/Egress Route Fuelbreaks	0.1	0.2
	Total	**28.3**	**19.1**
Monte Bello OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	18.8	21.8
	Target Hazards Fuelbreaks	0.4	-
	Fire Management Logistics Areas	0.5	0.7
	Shaded Fuelbreaks	0.2	-
	Ingress/Egress Route Fuelbreaks	5.8	2.0
	Total	**25.7**	**24.5**
Picchetti Ranch OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	13.2	8.3
	Fire Management Logistics Areas	0.8	-
	Ingress/Egress Route Fuelbreaks	0.7	-

Managed Land	Type of VMA that May be Created on Steep Slopes	> 35% to ≤ 50% Slope (Acres)	> 50% Slope (Acres)
	Total	**14.7**	**8.3**
Pulgas Ridge OSP	Eucalyptus and Acacia Removal	10.9	3.3
	Fire Agency New Recommended Fuelbreaks	4.1	1.6
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	1.2	0.3
	Target Hazards Fuelbreaks	0.8	0.6
	Shaded Fuelbreaks	1.0	0.2
	Total	**18.0**	**6.0**
Purisima Creek Redwoods OSP	Eucalyptus and Acacia Removal	3.6	0.9
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	23.5	26.7
	Ingress/Egress Route Fuelbreaks	0.3	0.1
	Total	**27.4**	**27.7**
Rancho San Antonio OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	5.4	1.7
	Target Hazards Fuelbreaks	2.0	-
	Fire Management Logistics Areas	1.1	0.2
	Total	**8.5**	**1.9**
Russian Ridge OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	51.1	37.9
	Fire Management Logistics Areas	0.2	0.1
	Non-Shaded Fuelbreaks	2.5	1.0
	Shaded Fuelbreaks	20.7	16.0
	Ingress/Egress Route Fuelbreaks	1.8	0.4
	Total	**76.3**	**55.4**
Saratoga Gap OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	37.9	70.5
	Fire Management Logistics Areas	0.2	0.2
	Total	**38.1**	**70.7**
Sierra Azul OSP	Eucalyptus and Acacia Removal	1.7	1.4
	Fire Agency New Recommended Fuelbreaks	10.1	7.1

Managed Land	Type of VMA that May be Created on Steep Slopes	> 35% to ≤ 50% Slope (Acres)	> 50% Slope (Acres)
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	138.0	128.9
	Fire Management Logistics Areas	8.5	5.6
	Shaded Fuelbreaks	0.2	-
	Ingress/Egress Route Fuelbreaks	37.6	38.6
	Total	**196.1**	**181.6**
Skyline Ridge OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	51.5	38.5
	Target Hazards Fuelbreaks	0.4	-
	Fire Management Logistics Areas	0.8	0.2
	Total	**52.7**	**38.7**
St. Joseph's Hill OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	15.3	7.6
	Fire Management Logistics Areas	0.1	-
	Total	**15.4**	**7.6**
Teague Hill OSP	Fire Agency New Recommended Fuelbreaks	6.0	2.1
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	0.5	0.1
	Total	**6.5**	**2.2**
Thornewood OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	2.6	1.0
	Shaded Fuelbreaks	7.9	2.6
	Total	**10.5**	**3.6**
Tunitas Creek OSP	Eucalyptus and Acacia Removal	12.5	6.4
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	8.4	6.3
	Total	**20.9**	**12.7**
Windy Hill OSP	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	32.8	30.3
	Non-Shaded Fuelbreaks	29.5	6.6
	Total	**62.3**	**36.9**

Impacts would include those identified for manual and mechanical methods, such as mowing and pile burning, and from access and vehicle travel. IPMP BMP 28 requires installation of erosion-control measures on unstable soils or steep slopes. Additional measures may also be needed to reduce effects. MM Geology-2 would further reduce potential impacts to less than significant by restricting the types of activities that could occur and requiring implementation of erosion controls depending on the steepness of the slopes.

Prescribed Fire Plan

Prescribed burns would remove vegetation and disrupt soils, which could lead to increased landslide risk. The installation of fire lines would create areas susceptible to increased landslides by removing vegetation and leaving soils exposed. The potential risk of landslides would be reduced with implementation of Midpen's erosion control measures (IPMP BMP 28). As previously described, MM Geology-2 requires a 50-foot buffer around perennial and intermittent streams when a prescribed burn is proposed on a slope greater than 35 percent and upslope of the stream to minimize potential risk of a landslide impacting water quality. MM Geology-3 requires the use of existing barriers such as roads, trails, or wet lines as fire lines and the restoration of fire lines upon completion of the prescribed burn if they would not be used again. Prescribed burn boundaries would be designed to avoid gullies and highly erodible soils to the fullest extent possible. Impacts would be less than significant with mitigation.

Wildland Fire Pre-Plan

Implementation of a Wildland Fire Pre-Plan could require the use of vehicles, access roads, and manual or mechanical equipment, which could increase the risk of landslides by reducing vegetation, as discussed above. A study of landslides associated with forest management, roads, or natural occurrences, found that most landslides (58 percent) were associated with roads compared to much lower occurrences associated only with forest practices (29 percent related to logging) and even lower landslides associated with natural slopes (12 percent) (McClelland, et al., 1998). Installation of spur roads could contribute to an increase in landslide risk. While staging areas and landing zones could contribute to an increased landslide risk, these types of infrastructure would not typically be installed on steep slopes due to logistics. These potentially significant impacts would be mitigated with implementation of IPMP 28 and MM Geology-2, where necessary, by installing erosion control measures to reduce the potential for landslides and identifies measures to be implemented when installing roads or other cleared areas on steep slopes. Impacts would be less than significant with mitigation.

	Significance Determination
Impact Geology and Soils-4: Impacts from expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), or corrosive soil, creating substantial direct or indirect risks to life or property.	**Less than significant with mitigation**

Expansive soils are not present in most Midpen lands. Expansive soils may be present in Ravenswood OSP and Stevens Creek Shoreline Nature Area where saturated bay mud occurs. Implementation of the VMP and PFP would not involve the construction of structures and,

therefore, these plans would have no impact related to risks to life or property from construction on expansive or corrosive soils.

New infrastructure may be constructed under a Wildland Fire Pre-Plan in Ravenswood OSP or Stevens Creek Shoreline Nature Area, which could create a risk to infrastructure or property if located on an expansive soil. Construction of water storage tanks, staging areas, pumps, and hydrants pose a minimal risk as these new features would generally be small. Minor cracking of concrete could result if expansion were to occur under these features, but the impact would be minimal. Risks associated with construction of roads and spur roads on expansive soils would be reduced through standard roadway construction practices, including proper ground preparation (e.g., gravel treatment or over excavation) and proper surface and subsurface drainage. A significant impact could occur if long underground water supply pipelines beyond 20 feet are constructed within an expansive soil; however, underground pipelines proposed in Wildland Fire Pre-Plans would primarily consist of minor connecting pipes. MM Geology-4 requires that soils be assessed prior to construction of long-underground water supply pipelines in either Ravenswood OSP or Stevens Creek Shoreline Nature Area, and if determined that expansive soils are present, modified design standards shall be incorporated to reduce the potential risk associated with soil expansion, or soils with low expansion potential shall be used. Implementation of mitigation would reduce the impact to less than significant.

Impact Geology and Soils-5: Soils incapable of adequately supporting the use of septic tanks or alternative waste-water disposal systems where sewers are not available for the disposal of wastewater.	**Significance Determination**
	No impact

Soils with high clay content are typically undesirable for septic tank locations. While clay soils are present in some parts of Midpen lands, no septic tanks or alternative wastewater disposal system would be installed as part of the Program. Any need for sanitary services would be provided by temporary port-o-lets or existing facilities. No impact would occur.

Impact Geology and Soils-6: Direct or indirect impacts on a unique paleontological resource or site or unique geologic feature.	**Significance Determination**
	Less than significant

Some fossils have been recorded within the Program area, but none are considered to be unique[1] paleontological resources. The majority of the geologic units that underlie the Program area have low potential to yield unique paleontological resources. Pleistocene alluvium has a moderate potential to yield paleontological resources within the Program area, and the largest deposits are found in Sierra Azul and Rancho San Antonio OSPs. Several additional OSPs that

[1] For the purposes of this analysis, unique paleontological resources have the same definition as scientifically significant paleontological resources.

contain Pleistocene alluvium only feature a small amount of this geologic unit in comparison to other units, and these areas are not likely to yield unique paleontological resources.

Soil disturbance is minimal for most activities identified under the Program. Vegetation removal would not disturb soil depths in excess of shrub or tree roots. The potential for ground-disturbing activities to uncover, much less destroy, a unique paleontological resource, therefore, is very unlikely because resources are usually found at least a few feet but often many feet below the ground surface. In the unlikely event that paleontological resources are excavated during ground-disturbing activities associated with the Program (such as for firefighting infrastructure installation under the Pre-Fire Plan) and the resource was damaged or destroyed, the impact could be significant. IPMP BMP 26 requires that Midpen employees at each site receive training in the recognition of sensitive paleontological resources and that in the event of a find, work in the area be halted until a qualified archaeologist can evaluate the significance of the find. Because appropriate BMP measures are in place to recognize and avoid paleontological resources within Midpen lands, the impact on unique paleontological resources from implementation of the Program would be less than significant.

4.6.6 Mitigation Measures

MM Geology-1: Prescribed Herbivory Land and Trail Control

Livestock will be used for vegetation management to reduce the use of chemical herbicides, to control invasive vegetation, and to promote the growth of native vegetation. Methods shall be implemented to reduce the potential creation of prescribed herbivory trails and erosional features, including the following:

- Limit or prohibit prescribed herbivory within 100 feet of lakes/reservoirs, creeks, streams, riparian corridors, and wetlands, using fencing or natural features to prevent livestock from entering streams and riparian areas, depending upon a qualified professional's assessment. The following measures would be considered by the qualified professional and implemented where appropriate:
  - In riparian areas, livestock shall be excluded from the top of bank of a defined channel by installing fencing on the edge of riparian canopy where topography does not naturally exclude access.
  - Water and feed troughs shall be installed away from natural water sources.
  - In wetlands, livestock shall be excluded only where the percent cover of vegetation is low.
- Implement methods, which could include rotating or providing multiple feeding areas to minimize excessive congregation of animals in any one location for too long, as determined by a qualified professional.
- Limit the number of animals in a particular-sized area using the stocking-rate equation taking into account days assumed to graze, slope, yield of the land, number of animals, weight of animals, and other appropriate factors.
- Conduct surveys of the prescribed herbivory area during active grazing; identify if trails or other erosion features are forming.
- Ensure there are appropriate rest periods between active prescribed herbivory in any one area to allow regrowth of plants and appropriate amounts of residual dry matter (RDM) to remain on the ground to achieve desired vegetation-management objectives.
- If prescribed herbivory trails or damaged areas form, the bare area shall be remediated by decompacting the soil and discontinuing prescribed herbivory in the area until the trails are revegetated, as determined by a qualified professional.
- Excessive livestock grazing on steep slopes (generally slopes with more than 35 percent grade) shall be discouraged or avoided using the methods described above (e.g., water and feed trough locations, stocking-rate equation) or fencing where determined appropriate by a qualified professional.

- During surveys of active prescribed herbivory, conduct ongoing surveillance of installed erosion control features around riparian areas and any fences installed.
- Repair damaged fencing or erosion-control features as necessary.

Applicable Location(s): Prescribed herbivory areas.

Performance Standards and Timing:

- **Before Activity**: Install fencing as needed.
- **During Activity**: (1) Limit number of animals in an area based on appropriate calculations, and minimize congregation of animals in any one location, (2) repair damaged fencing or erosion control features, and (3) conduct surveys during prescribed herbivory to identify problem areas.
- **After Activity**: (1) Permit appropriate rest periods after prescribed herbivory, and (2) remediate any bare areas.

MM Geology-2: Erosion Control and Slope Stability Measures

In addition to Midpen's erosion-control measures (IPMP BMP 28), control measures shall be implemented to ensure vegetation management does not result in erosion, loss of topsoil, or slope instability in areas where work could expose bare soils or create loss of root-soil matrix strength. If groundcover or native mulch/organic matter is determined to be less than 70 percent following work or work is proposed to occur on steep slopes (over 35 percent slope), then control measures, as identified here, shall be implemented as determined appropriate by the qualified personnel.

Prior to conducting work in any given area under any management action that could result in erosion or slope instability (e.g., prescribed burns, tree removal, weed removal, or forest treatments that could reduce the groundcover and expose soil, or for infrastructure creation such as new roads, pipelines, or water storage tanks) the area shall be inspected for existing signs of erosion or slope instability (e.g., rills, slumped soil). Depending on the slope and the downslope resources (roads that could be impacted if a slope failed, waterbodies or habitat that could be impacted from erosion, important habitat, etc.), erosion and slope stabilization measures shall be determined prior to implementation of work, based on the list below. Generally, if an action would expose soils (leaving groundcover or native mulch/organic matter less than 70 percent), then measures to protect soils, minimize erosion, and prevent slope instability shall be implemented. The measures to be implemented shall depend on the site's specific characteristics and the type and extent of vegetation management work to be performed. The inspection and determination of appropriate measures shall be made by qualified personnel with knowledge and experience (a person with a qualified SWPPP developer [QSD] or a qualified SWPPP practitioner [QSP]) in the application of erosion and slope-stabilization control measures through training or field experience with control measure installation. The qualified personnel shall memorialize in writing their field observations and corresponding recommendations regarding installation of control measures.

General Control Measures

The following measures shall be considered for implementation and required as determined appropriate by the qualified personnel during work as applicable:

- Minimize areas to be disturbed to the greatest extent feasible.
- Shut down use of heavy equipment, skidding, and truck traffic when soils become saturated and unable to support the machines.
- No substantial ground disturbing work (e.g., use of heavy equipment, pulling large vegetation) shall occur during rain events and 48 hours after a rain event, defined as 0.5 inch of rain within a 48-hour or greater period, using the NOAA website as the official record for rain events.

Reduced Groundcover Control Measures

MM Geology-2: Erosion Control and Slope Stability Measures

The following measures shall be considered for implementation and required as determined appropriate by the qualified personnel during work if the activity may leave less than 70 percent of groundcover or native mulch/organic material and as applicable:

- Sow native grasses and other herbs on denuded areas where natural colonization or other replanting will not occur rapidly; use slash or chips to prevent erosion on such areas.
- Use surface mounds, depressions, logs, rocks, trees and stumps, slash and brush, the litter layer, and native herbaceous vegetation downslope of denuded areas to reduce sedimentation and erosion, as necessary to prevent erosion or slope destabilization.
- Install approved, biodegradable erosion-control measures and non-filament-based geotextiles (e.g., coir, jute) when:
  - Conducting substantial ground-disturbing work (e.g., use of heavy equipment, pulling large vegetation) within 100 feet and upslope of currently flowing or wet wetlands, streams, lakes, and riparian areas;
  - Causing soil disturbance on moderate to steep (10 percent slope and greater) slopes; and
  - Following the removal of invasive plants from stream banks to prevent sediment movement into watercourses and to protect bank stability.
- Sediment control devices, if installed, shall be certified weed-free, as appropriate. Sediment control devices shall be inspected daily during active construction to ensure that they are in good repair and working as needed to prevent sediment transport into the waterbodies (and repaired as needed).

Once work is completed, the areas shall be inspected as needed and as accessible but at least annually until groundcover exceeds 70 percent and it is clear that significant erosion and slope instability are not occurring. At that time, erosion control and slope stability devices may be removed at the discretion of District staff.

Steep Slopes Control Measures

The following measures, in addition to the ones described above, shall be considered for implementation and required as determined appropriate by the qualified personnel during work conducted on steep slopes (greater than 35 percent) and as applicable:

- Avoid use of heavy equipment on slopes greater than 35 percent unless specialized equipment is used that does not impact slope stability.
- Prescribed and pile burns shall be performed outside of perennial and intermittent streams and of riparian forest/ woodland. A 50-foot buffer around perennial and intermittent streams shall be maintained when the burn is proposed upslope of the stream on slopes greater than 35 percent.
- Avoid installation of cleared areas, including spur roads or staging areas, on steep slopes, particularly over 50 percent slope, where feasible. Where not feasible, implement appropriate design and control measures including but not limited to those identified in *Low-Volume Roads Engineering* (Keller & Sherar, 2003) or other suitable engineering guidance, such as:
  - Locate roads on well-drained soils and slopes where drainage moves away from the road
  - Provide adequate surface drainage
  - Avoid wet and unstable areas (seeps, springs, etc.)
  - Use the natural topography to control or dictate the ideal location of road or cleared area (e.g., staging area); use saddles, follow ridges, use bench areas, etc.

In areas of steep slopes (greater than 35 percent) that are located above infrastructure or sensitive habitat, a geologist shall perform an assessment if intensive tree removal (e.g., eucalyptus removal) is proposed to evaluate whether erosion and/or slope instability could occur from tree removal. Recommendations provided in the assessment shall be implemented as needed to ensure that slope instability does not occur. Recommendations could include measures such as stabilizing slopes with mats or natural materials after tree removal and replanting to bind soils.

MM Geology-2: Erosion Control and Slope Stability Measures

Applicable Location(s): Any areas where the ground is disturbed and soils are exposed through vegetation management activities with measures specific to areas on steep slopes.

Performance Standards and Timing:

- **Before Activity:** Inspect areas prior to treatment to assess the potential for erosion and soil instability.
- **During Activity:** Implement protection measures as needed to avoid or minimize erosion and slope instability.
- **After Activity:** Conduct inspections as needed, depending on the size and nature of the work and the site, to ensure that erosion is not occurring and to remove any erosion control devices once they are no longer needed.

MM Geology-3: Fire Lines During Prescribed Burns

The following measures shall be implemented during prescribed burns to reduce erosion from fire lines:

- Use existing barriers such as roads, trails, or wet lines as fire lines. If new fire lines must be established for a prescribed burn, fire lines shall be restored as described below.
- Restore fire lines upon completion of the burn if they are not used again (unless they are existing roads, trails, or other permanent elements). Utilize erosion-control measures, such as sediment traps, during restoration to reduce sedimentation impacts. Complete restoration activities within one month after a fire line is created unless the fire line is planned to be used during another burn within one year. Restore all fire lines that do not use existing infrastructure (i.e., roads, trails, or other permanent elements) within one year of use. Rehabilitation methods may include use of a hydromulch with locally collected, genetically appropriate, native species; pulling duff, litter, and cut material back over lines; and/or distribution of locally chipped fuels on the lines.
- Design prescribed burn boundaries to avoid gullies and highly erodible soils to the fullest extent possible.

Applicable Location(s): Prescribed burn sites.

Performance Standards and Timing:

- **Before Activity**: Determine fire lines.
- **During Activity**: Set up provisions as specified in the measure.
- **After Activity**: Restore fire lines that will no longer be used upon completion of work.

MM Geology-4: Soil Assessment for Construction of New Water-Supply Pipelines

The following soil-assessment measures shall be implemented to ensure significant risks to life or property do not occur as a result of water-supply pipeline construction in an expansive soil in Ravenswood OSP or Stevens Creek Shoreline Nature Area:

1. Consult GIS data to determine if expansive soils may be present within the proposed construction site.
2. Conduct a field assessment using a proven scientific test or method, such as a soil expansion index test, to verify presence of expansive soils on the site.
3. If verified to be present, determine if the expansive soils can be avoided through design specifications. If appropriate design measures cannot be utilized to avoid expansive soils, no excavated soil shall be used for fill during construction; instead, clean fill soils with a low expansion potential shall be used.

Applicable Location(s): Locations of new water-supply pipeline construction in Ravenswood OSP or Stevens Creek Shoreline Nature Area.

MM Geology-4: Soil Assessment for Construction of New Water-Supply Pipelines

Performance Standards and Timing:

- **Before Activity:** (1) Obtain permits if appropriate and (2) prepare plans and design specifications according to results of soil assessment.
- **During Activity:** Monitor construction and ensure proper construction practices are implemented.
- **After Activity:** Verify appropriate soils were used during construction.

4.7 Greenhouse Gas Emissions

4.7.1 Introduction

This section addresses GHG emissions and climate change. This analysis reflects evolving scientific knowledge and State regulatory schemes. The GHG analysis is based on field observations, air quality and GHG modeling, and policies related to carbon sequestration. A lead agency has discretion to use a model or methodology to estimate GHG emissions resulting from a project when the selection of the model or methodology is supported by substantial evidence.

One comment related to GHG emissions was received during the public scoping period. A summary of the comment and the location where it is addressed in the greenhouse gas emissions analysis are provided in Table 4.7-1.

Table 4.7-1 Greenhouse Gas Emissions Scoping Comments

Summary of Comment	Location Addressed
The EIR should address how the Program will affect carbon sequestration as a means of addressing climate change.	Section 4.7.4: Impact Assessment Methodology Section 4.7.5: Impact Analysis

4.7.2 Existing Environment

Greenhouse Gas Emissions

Overview

Gases that trap heat in the atmosphere (i.e., GHGs) regulate the earth's temperature. A well-balanced and functioning greenhouse gas effect serves to maintain a habitable climate. The most common GHGs are CO_2 and water vapor. Other critical GHGs include methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). GHGs are released into the earth's atmosphere through a variety of natural processes and human activities. Some common emissions sources of GHGs are listed in Table 4.7-2.

Table 4.7-2 Greenhouse Gas Emissions Sources

Source Category	Example Source	GHG
Energy	Electricity generation	CO_2
	Transportation	N_2O
Industry	Refrigeration and cooling	HFCs
	Semi-conductor manufacturing	PFCs
	Substations	SF_6

Source Category	Example Source	GHG
Agriculture	Crop fertilization	N_2O
	Livestock	CH_4
Waste	Landfill operation	CH_4

Each GHG has its own potency and effect upon the earth's energy balance, expressed in terms of a global warming potential (GWP), with CO_2 being assigned a value of 1 and SF_6 being several orders of magnitude stronger, with a GWP of 23,500 (IPCC, 2013). In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of equivalent CO_2 (CO_2e).

The overwhelming body of scientific research supports the theory that global climate change is currently affecting weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California could be adversely affected by global climate change. Increased precipitation and sea level rise could increase coastal flooding, increasing saltwater intrusion on groundwater, and hastened degradation of wetlands. Mass migrations and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, wildland fires, hurricanes, and drought; and increased levels of air pollution.

Statewide Greenhouse Gas Emissions

Total gross estimated California GHG emissions in 2017 were 424 million metric tons of CO_2 equivalent ($MTCO_2e$), five $MMTCO_2e$ lower than 2016 levels and seven $MMTCO_2e$ below the 2020 GHG Limit of 431 $MMTCO_2e$ (CARB, 2019a). Table 4.7-3 shows the Statewide GHG emissions for the years 1990 and 2017 (CARB, 2019b).

During the 2000 to 2017 period, per capita GHG emissions in California have dropped from a 2001 peak of 14.1 tons per person to 10.7 tons per person in 2017, a 24 percent decrease. The reductions in California GHG emissions during this period are attributed to energy efficiency and conservation efforts (CARB, 2019b).

Table 4.7-3 California Greenhouse Gas Inventory

Source Category	1990 (million $MTCO_2e$)	2017 (million $MTCO_2e$)
Energy (fuel combustion, electricity generation, energy extraction and production)	386.41	348.9
Industrial processes and product use	18.34	33.6
Agriculture, forestry, and other land use	19.11	30.7

Source Category	1990 (million $MTCO_2e$)	2017 (million $MTCO_2e$)
Waste	9.42	10.8
Gross California GHG emissions	**433.29**	**424.1**

Sources: (CARB, 2007; CARB, 2019a)

Regional Greenhouse Gas Emissions

Total GHG emissions in the SFBAAB steadily increased by 29 percent between 1990 and 2011, to a total of 86.6 $MTCO_2e$ in 2011, as shown in Table 4.7-4. Between 1990 and 2011, per capita emission rates in SFBAAB increased by approximately 5 percent (BAAQMD, 2015). Total emissions in 2011 and 2015 have increased since 1990, but in 2015 total GHG emissions decreased by 2 percent compared to 2011, as shown in Table 4.7-4 and Table 4.7-5. The overall emissions in NCCAB decreased by 21 percent between 1990 and 2015 as shown in Table 4.7-6. The population of the NCCAB was approximately 600,000 in 1990 and increased to approximately 764,000 in 2015 (27 percent growth) (World Population Review, 2020).

Table 4.7-4 SFBAAB Greenhouse Gas Inventory (million $MTCO_2e$)

Source Category	1990	2011
Transportation	28.6	34.3
Industrial/ Commercial	21.0	31.0
Electricity/ Co-Generation[a]	8.4	12.1
Residential Fuel Usage	7.0	6.6
Agriculture/ Farming	1.2	1.3
Off-Road Equipment	0.9	1.3
Total SFBAAB GHG Emissions	**67.1**	**86.6**

Note:

[a] Includes imported electricity emissions of 2.7 million $MTCO_2e$.

Source: (BAAQMD, 2015)

Table 4.7-5 SFBAAB Greenhouse Gas Inventory (Percent)

Source Category	2015
Transportation	41%
Industrial	26%
Electricity/ Co-Generation[a]	14%
Residential/ Commercial	10%
Agriculture/ Farming	1%

Source Category	2015
Recycling/ Waste	3%
High GWP Gases	4%
Total SFBAAB GHG Emissions	**100% (84.7 million MTCO2e)**

Source: (BAAQMD, 2017)

Table 4.7-6 NCCAB Greenhouse Gas Inventory (million $MTCO_2e$)

Emissions	1990	2011	2015
Total	3.77	3.49	2.98

Note:

Emissions from energy use other than electricity or natural gas are not included in these inventories; emissions from septic tank systems are likewise not included.

Source: (AMBAG, 2018)

Carbon Sequestration

Carbon sequestration is the process by which atmospheric CO_2 is absorbed by vegetation through photosynthesis and stored as carbon in trunks, branches, foliage, roots, and soils and also in forest litter. Carbon sequestration in terrestrial ecosystems is defined as the net removal of CO_2 from the atmosphere into long-lived stocks of carbon (Shaw, et al., 2009). Forests serve as large reservoirs of sequestered carbon. In the U.S., forest carbon sinks have been estimated to offset between 12 and 19 percent of the nation's total carbon emissions (Ryan, et al., 2010). Forests store carbon in virtually all their components: soils, litter (forest floor), understory, and trees (Wayburn, et al., 2007). Forest-soil carbon is a large, reasonably stable pool (Scharlemann, Tanner, Hiederer, & Kapos, 2014). Grasslands contain approximately 12 percent of the terrestrial carbon stocks in the world. Approximately 81 percent of the carbon is stored in the soil of a grassland, with most of the remaining carbon stored in the belowground biomass of the grasses (USFS, 2017).

Wildland fire is the single largest source of carbon storage loss and GHG emissions from forested lands. In California, an estimated 120 million metric tons of carbon was lost through wildland fire over the period from 2001 to 2010, out of a total estimated carbon storage loss of 150 million metric tons, where the balance was lost from tree thinning, prescribed fire and other vegetation management or removal activities (CARB, 2017c). An estimated 20 million acres of forestland in California has a high wildland fire threat that would benefit from fuels reduction treatment, which would serve to both reduce the risk of wildland fire (and the resulting carbon loss and GHG emissions) and improve ecosystem health (CAL FIRE, 2016).

Another source of carbon storage loss that is prevalent on Midpen lands is SOD. SOD and other forest diseases do not cause an immediate release of carbon like a fire but do increase susceptibility to large, widespread fires and, in the long run, reduce the carbon-storage capacity

as more trees become infected and die, losing their carbon to the atmosphere through decomposition.

4.7.3 Regulatory Setting

Federal

United States Environmental Protection Agency – Clean Air Act
On April 2, 2007, the Supreme Court found in *Massachusetts v. USEPA* that GHGs are air pollutants under the CAA. USEPA, therefore, has the authority to regulate GHG emissions. The Supreme Court found that the CAA authorizes USEPA to regulate motor-vehicle GHG emissions if USEPA determines they cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare (USEPA, 2017). To regulate GHGs from passenger vehicles, USEPA issued an endangerment finding, which identifies emissions of six key GHGs: CO_2, CH_4, N_2O, HCFCs, PFCs, and F_6. These GHG emissions of the Program are evaluated below.

State

California Air Resources Board – Global Warming Solutions Act of 2006 (Assembly Bill 32)
In September 2006, the State legislature passed, and Governor Schwarzenegger signed, AB 32 (Chapter 488, States of 2006), the Global Warming Solutions Act of 2006, which set the 2020 GHG emissions reduction goal into law. The Global Warming Solutions Act of 2006 directed CARB to begin developing discrete early actions to reduce GHG emissions while also preparing the Climate Change Scoping Plan (Scoping Plan), which outlines a framework of measures that would eventually be adopted and implemented to reach AB 32 goals (CARB, 2016b). CARB approved the Scoping Plan in 2008 and updated it in May 2014 (Scoping Plan First Update). The Program is subject to the regulations and implementation measures outlined in the Scoping Plan to achieve AB 32 goals.

In September of 2016, AB 32 was extended to achieve reductions in GHG of 40 percent below 1990 levels by 2030. Adopted regulations that correspond to elements of the Scoping Plan include the 33 percent Renewable Portfolio Standard by 2020 (SB X1-2), the Cap-and-Trade Program, and the Low Carbon Fuel Standard. The updated Scoping Plan identifies actions for each sector (i.e., energy, transportation, agriculture, water, waste management) that California should take to meet its climate-change goals. Recommended actions of the Scoping Plan First Update, relevant to the Program, within CARB's purview, are generally related to Transportation and to Natural and Working Lands (CARB, 2014). The newest Scoping Plan, adopted in 2017, (2017 Scoping Plan) describes ongoing and proposed programs and policies to achieve the 2030 GHG emissions target for several sectors (i.e., energy, transportation, industry, water, waste management, and natural and working lands) (CARB, 2017a).

California Air Resources Board – Sustainable Communities and Climate Protection Act of 2008 (Senate Bill 375)

Senate Bill (SB) 375, signed by Governor Schwarzenegger in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy showing prescribed land-use allocation in each MPO's Regional Transportation Plan. ARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The applicable MPO in the Program region is the Metropolitan Transportation Commission (MTC). MTC, in conjunction with the Association for Bay Area Governments (ABAG), adopted Plan Bay Area in 2013, which includes the Bay Area region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan.

California Air Resources Board – Mobile Source Strategy

CARB has prepared the Mobile Source Strategy, which addresses the current and proposed programs for reducing all mobile-source emissions, including GHG emissions. The Mobile Source Strategy identifies programs that the State and federal government have, or will adopt, that which further the goals of the Scoping Plan. Some programs provide incentives to facilitate increased purchase of new, lower-emission light-, medium-, and heavy-duty vehicles to aid the State in achieving emission reduction goals. Other programs require certain engine years to upgrade the engine to newer, cleaner engines by specific dates or strict performance standards for specific model years. These programs for more stringent emissions standards are required by State and federal law and are monitored by CARB or USEPA (CARB, 2016c). All Program activities must comply with CARB's Mobile Source Strategy.

California Air Resources Board – Advanced Clean Cars

CARB also adopted a suite of regulations, collectively referred to as the Advanced Clean Cars program, that apply to vehicle model years 2015 through 2025 to control smog and soot-causing pollutants and to lower fuel use, which in turn reduces GHG emissions (CARB, 2017b).

California Air Resources Board – California Forest Carbon Plan

California's Natural and Working Lands (previously the Forest Sector) play a role in helping California meet the GHG reduction goals. These lands include both forests and rangelands and can act as both a carbon source and sink, with the levels of each fluctuating widely from year to year based on climatic and biotic factors that impact vegetative growth. The scoping plans, as well as the Final California Forest Carbon Plan (CAL FIRE, 2018), recognize that some actions taken to address ecosystem health may result in temporary, short-term reductions in carbon sequestration but are necessary to maintain forest health and reduce massive carbon storage losses due to wildland fire. California's overarching climate goals for forests are to (a) secure them as resilient net sinks of carbon; (b) minimize the GHG emissions associated with management activities and wildfire events; and (c) employ management actions that deliver a full suite of ecosystem benefits to conifer forest health. These goals will continue to complement

broader, ambitious climate goals and support existing natural resources policies. Since tree and vegetation removal would be conducted under the Program, the Program is subject to the goals defined in the California Forest Carbon Plan. Three primary objectives support these goals:

1. ***Protect:*** Increase protection of California's forested lands and reduce conversion to non-forest uses, resulting in a more stable forested land base.
2. ***Enhance:*** Expand and improve forest management to ameliorate forest health and resilience, resulting in enhanced long-term carbon sequestration and storage potential.
3. ***Innovate:*** Pursue innovations in wood products and biomass utilization and in markets that result in productive use of harvested woody material in a manner that reduces or offsets GHG emissions; promotes land stewardship; and strengthens rural economies and communities.

Local

Metropolitan Transportation Commission and the Association for Bay Area Governments
Pursuant to SB 375, the MTC and ABAG was tasked by CARB to achieve a 10 percent per capita reduction in passenger-vehicle generated transportation emissions by 2020 and a 16 percent per capita reduction by 2035 from 2005 levels, which CARB confirmed the region would achieve by implementing its Sustainable Communities Strategy.

MTC and ABAG have worked together to craft Plan Bay Area 2040, an update to the previous plan to identify opportunities that can help steer the region toward the goals set forth in Plan Bay Area 2035. Plan Bay Area 2040 was adopted in July 2017 and integrates transportation, land use, and housing to meet greenhouse gas reduction targets set by CARB (MTC, 2017). Program activities are subject to the goals and objectives outlined in Plan Bay Area. MTC and ABAG are currently working to prepare Plan Bay Area 2050.

Midpeninsula Regional Open Space District – Resource Management Policies
Midpen's resource management includes management of natural, cultural, and agricultural resources. Midpen recognizes that the regulation of greenhouse gas emissions is a key component in preserving open space resources (Midpen, 2014a). The following goals and policies relate to greenhouse gases. As part of the Program, a few of these policies would be revised and augmented to better support the Program goals of wildland fire resiliency, as summarized in Appendix A to the Program. Changes by Policy are summarized in parentheses, below.

Goal CC	Reduce agency-generated greenhouse gas emissions, increase carbon sequestration, and promote resilience to climate change impacts.
Policy CC-1	Reduce administrative greenhouse gas (GHG) emissions 20 percent below 2016 baseline by 2022, 40 percent below 2016 baseline by 2030, and 80 percent below 2016 baseline by 2050, in line with the State of California's GHG reduction goals.

Policy CC-2	Reduce non-administrative GHG emissions related to Midpen activities, such as visitor transportation and livestock.
Policy CC-3	Increase carbon sequestration in vegetation and soils and minimize carbon release from wildfire. (Additional details are proposed to consider trade-offs between carbon sequestration losses from fuel-load reduction and emissions from prescribed fire to establish ecological resiliency, given the benefits of reduced wildfire risk).
Policy CC-4	Prepare for climate-change impacts and promote resilience for both natural and built environments. (Additional details are proposed to establish goals for biodiversity and ecosystem structure and function)
Policy CC-5	Lead by example and support state, regional, and community-scale action on reducing climate change impacts to ecosystem health and biodiversity and on increasing ecosystem resilience.

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies as well as public input (Midpen, 2014b). Midpen uses the priorities set forth in the Vision Plan to guide future work to fulfill its overarching mission and management decisions related to the lands and open spaces that are included in the Program. The following pertains to greenhouse gas emissions within Midpen lands:

Stewardship:

- Prevent or address erosion and pollution.

Midpeninsula Regional Open Space District – Climate Action Plan

Climate change is a direct threat to Midpen's mission to acquire and preserve a regional greenbelt of open space land in perpetuity. The Climate Action Plan serves as a roadmap to meet Midpen's ambitious commitment to reduce administrative GHG emissions 20 percent below the 2016 baseline by 2022, 40 percent by 2030, and 80 percent by 2050 (Midpen, 2018). The Climate Action Plan identifies specific actions to meet these GHG reduction goals for administrative operations. Some of the actions that would affect Program implementation include the switch from diesel to renewable diesel and incentives to use transit, carpool, or bicycle to work. The Program activities are not administrative in nature, but some identified actions outlined in the Climate Action Plan could indirectly apply to equipment used and the workforce that implements the Program.

San Mateo County – General Plan

Midpen lands within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The San Mateo County General Plan Energy and Climate Change

Element includes the following goals for greenhouse gas emissions related to the Program (San Mateo County, 2013):

Goal 1	Promote and implement policies and programs to reduce community-wide greenhouse gas emissions.
Goal 2	Maximize energy efficiency in new and existing development.
Goal 3	Promote the expansion of the use of renewable energy supplies.
Goal 4	Promote and implement policies and programs to reduce vehicle miles traveled by all vehicles traveling in the unincorporated county.
Goal 5	Encourage the use of clean, low-emissions vehicles and equipment.
Goal 6	Promote and implement policies and programs with the goal of achieving zero waste.
Goal 7	Support sustainable agricultural practices.
Goal 8	Promote and implement policies and programs to reduce water use.

Santa Clara County – General Plan

Santa Clara County adopted a revision to the Health Element of the Santa Clara County General Plan in August 2015. The Health Element of the Santa Clara General Plan includes policies related to the improvement of air quality and reduction of greenhouse gas emissions within the county (Santa Clara County, 2015). A large portion of the Program is within Santa Clara County and, this being the case, the following policies would generally apply to the work:

HE-C.20	**Greenhouse gases and air quality**. The County shall promote plans and developments that reduce GHG emissions and result in decreased air pollution, especially for communities with disproportionate exposure to air pollution, and for vulnerable populations such as children, seniors, and those with respiratory illnesses.
HE-G.1	**Air quality environmental review**. The County shall continue to utilize and comply with the Air District's project- and plan-level thresholds of significance for air pollutants and GHG emissions.
HE-G.4	**Off-road sources**. The County shall encourage mobile source emission reduction from off-road equipment such as construction, farming, lawn and garden, and recreational vehicles by retrofitting, retiring and replacing equipment and by using alternate fuel vehicles.
HE-G.6	**Regional/local plans**. The County shall encourage and support regional and local land use planning that reduces automobile use and promotes active transportation.

4.7.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on GHG emissions would be considered significant if they exceeded the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

(See CEQA Guidelines, Appendix G, I.)

Significance Thresholds

BAAQMD has established thresholds of significance for GHG emissions meant primarily for evaluating GHGs associated with land-use development or stationary-source projects and are not recommended for vegetation-management projects (Flores, 2020).

MBARD has established a threshold for stationary sources, but this threshold is also not relevant for vegetation-management projects (MBARD, 2016; Frisbey, 2020). No thresholds of significance have been established by BAAQMD, MBARD, or any other applicable government agencies that are suitable for the types of GHG-emitting activities proposed under the Program. This analysis presents quantitative GHG emissions estimates from implementing the Program and qualitatively evaluates whether the annual GHG emissions generated by fuel treatment and other activities implemented under the Program would be significant, based on increased emissions over existing conditions.

Analysis Methodology

Overview

This analysis addresses GHG emissions that could occur from implementation of the types of activities that comprise the Program, including manual and mechanical activities, pile burns, prescribed burning, prescribed herbivory, and access and vehicle travel to work sites. Estimated emissions are provided, as appropriate, for a maximum year of implementation, similar to the analysis presented in Section 4.3: Air Quality.

Baseline GHG Emissions

The GHG emissions calculations were assessed against the emissions currently generated under baseline conditions, shown in Table 4.7-7, which would comprise activities currently performed under the IPMP and other Midpen maintenance projects. GHG emissions were calculated using the same methods described in Section 4.3: Air Quality for criteria pollutants. See Section 4.3: Air Quality for a discussion of the modeling and assumptions used to calculate CO_2e emissions.

Table 4.7-7 Annual GHG Emissions Generated During Baseline Conditions ($MTCO_2e$)

Vehicles and Equipment	Pile Burn	Total Baseline Conditions Emissions
36.49	0.73	37.23

Notes:
No prescribed burns are conducted under Baseline Conditions.

Carbon Sequestration Analysis

Impacts on carbon sequestration are discussed qualitatively. Proposed activities, namely the fuel reduction activities (e.g., fuelbreak creation and maintenance) could all result in the short-term removal of some amount of carbon stock. Given the nature of the plan as an adaptive plan and the nature of several activities where the exact area of treatment is not currently known, the quantification of carbon stock lost cannot be reliably calculated. Such a calculation would depend on the health, size, and type of vegetation removed at the time of removal, which is difficult if not speculative to calculate at the present time. Calculations of the benefits of increased carbon sequestration rates over time are also made difficult due to the speculation involved in modeling the future regrowth of carbon stock in a healthy forest after treatments or the speculation involved in modeling the offset of carbon stock lost compared with the benefits gained by reduced fire risks for such management actions. A qualitative discussion of the benefits of the Program is provided as well as an analysis of the Program's consistency with the State's 2017 Scoping Plan and the Forest Carbon Plan.

4.7.5 Impact Analysis

	Significance Determination
Impact GHG-1: Generation of GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	**Significant and unavoidable**

Vegetation-management activities would consist of manual and mechanical vegetation removal, prescribed burning, prescribed herbivory, and revegetation and restoration activities. Use of vehicles and equipment during these activities and to reach project sites would also generate GHG emissions. Pile burning and, more substantially, prescribed burning would generate significant quantities of GHG emissions. Hand tools would not result in the emission of GHGs. The use of livestock specifically for fuel management purposes (prescribed herbivory[1]) would generate methane emissions, but due to the limited application of this vegetation-management method, these emissions were not calculated and are assumed to be minimal.

[1] The WFRP is a separate program from conservation grazing. Conservation grazing, while it results in fuel reduction, is not a part of this program.

GHG emissions associated with Program implementation would be generated from three sources: emissions from mechanical equipment and vehicles, emissions from pile burning, and emissions from prescribed burning, as shown in Table 4.7-8. The majority of the GHG emissions are caused by the proposed prescribed burning activities, similar to criteria air pollutants analyzed in Section 4.3: Air Quality.

Recommendations to minimize wildland fires and associated GHG emissions include pre-treatment by reduction of fuels and vegetation before using a prescribed fire, smoke management, and harvesting small woody biomass for energy (Thompson, 2008). A Smoke Management Plan must be prepared and implemented for prescribed burns in SFBAAB per BAAQMD's Regulation 5, and prescribed burns in MBARD (should a prescribed burn occur in the less than 3 percent of Program area within the MBARD) must adhere to smoke management requirements in accordance with Rule 438, which would minimize some GHG emissions due to adhering to seasonal and daily timing restrictions. The details of the PFP have not yet been established and are only presented programmatically at this time. MM Air Quality-2 requires Midpen to consider and implement measures to minimize emissions associated with a prescribed burn, as feasible, including pre-treating the proposed burn area and burning when fuels have a higher moisture content. Mitigation would minimize some GHG emissions, but GHG emissions would remain many magnitudes greater than existing conditions due to prescribed burning, and could significantly impact the environment.

Table 4.7-8 Annual GHG Emissions Generated During Baseline Conditions and the Maximum Year of Implementation ($MTCO_2e$)

Activity	Total Baseline Conditions Emissions	Total Maximum Year Program Emissions	Net Emissions[d]
Equipment and Vehicle Emissions	36.49	422.03	385.53
Pile Burning	0.73	366.92 [b]	366.19
Prescribed Burning	- [a]	9,423.10 [c]	9,423.10
Total GHG Emissions	**37**	**10,212**	**10,175**

Note:

Numbers may not add up due to rounding.

[a] No prescribed burns are conducted under baseline conditions.

[b] Assumes 500 tons per year.

[c] Assumes 500 acres per year.

[d] Appendix 4.7 provides the assumptions and calculations for the net emissions presented here.

The Program objectives and treatments proposed are intended to reduce the likelihood of a catastrophic wildland fire and severity of a wildland fire. Over the last 10 years, the number of acres burned by wildland fires has generally increased in California (CAL FIRE, 2018). Wildland

fires have accounted for a generally[2] increasing quantity of GHG emissions over the last 20 years, accounting for a greater quantity of California's overall GHG emissions (CARB, 2020). The climate is anticipated to become drier and hotter. These changes are expected to lead to increased frequency and intensity of large wildland fires and greater fire risks if fuel management activities are not expanded across the state (CNRA, 2018). One study found that implementing prescribed burning, in forest classes that historically had relatively frequent fire intervals and were determined to be amendable for burning, was modeled to reduce GHG emissions by 18 to 25 percent in statewide emissions for states in the western U.S. compared to wildland fires (Wiedinmyer & Hurteau, 2010). Wildland fires have been found to result in a greater quantity of carbon lost per acre compared to prescribed burning (CARB, 2017c). Fuels and vegetation treatments may result in a net carbon benefit in the long term, particularly in the context of avoided GHG emissions from reducing the risk of a catastrophic wildland fire. While modeling has found that emissions from all the mechanical pre-treatment plus prescribed burn emissions with a post-treatment wildland fire equaled the emissions from a comparably sized pre-treatment wildland fire, this is assuming that a pre- or post-treatment wildland fire would not burn a larger area (Hyde & Strand, 2019). It is expected that a wildland fire on Midpen lands in areas without Program treatments would have many times greater GHG emissions than comparable prescribed burning and would likely burn a larger area for a longer duration than a prescribed burn, resulting in burning of more fuel and even higher GHG emissions. These benefits are not readily quantifiable for comparison to the Program emissions because the likelihood of a catastrophic fire, the location, and the size cannot be accurately estimated. In the long-term the outcome of Program implementation may be beneficial, although the Program would emit a greater quantity of GHG emissions than existing conditions. The impact from emissions of GHGs on the environment from Program implementation would be potentially significant and unavoidable.

Impact GHG-2: Conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.	**Significance Determination**
	Less than significant

2017 Scoping Plan

The 2017 Scoping Plan lays out the framework for achieving compliance with 2030 Statewide GHG target of 40 percent below 1990 levels. The 2017 Scoping Plan identifies several goals and objectives for each sector. The two relevant sectors to the Program are the natural and working lands, and transportation sectors.

One of California's climate objectives is to minimize net GHG emissions caused by wildland fires. California experienced an overall loss of carbon stock between 2000 and 2010, of which wildland fires accounted for the largest reduction of carbon (approximately 80 percent of the

[2] The high GHG emissions in 2008 are an exception.

total carbon stock change) (CARB, 2017c). In the last half-decade, the largest and most devastating wildland fires in the State's history have occurred, resulting in even more carbon stock losses. The 2017 Scoping Plan recognizes the important role forests play in meeting the State's greenhouse gas reduction goals. The 2017 Scoping Plan establishes a target reduction goal in the natural and working lands sector of 15 to 20 million metric tons of carbon by 2030 and objectives to maintain a resilient carbon sink and minimize the net GHG and black carbon emissions associated with management, biomass disposal, and wildland fire events to 2030 and beyond. The goal and objectives will be achieved through increased carbon sequestration and a reduction in wildland fires. Land management via forest fuel reduction treatments and use of prescribed burning to reduce wildland-fire risks and attain healthy forests are recommended to establish the forests as reliable carbon sinks instead of emission sources due to ongoing fires. The Program objectives and activities include managing vegetation and infrastructure on Midpen lands to reduce wildland-fire risks and improve wildland-fire-fighting capabilities and coordination, which supports the 2017 Scoping Plan's goals and objectives of minimizing wildland fire and associated emissions. The Program would not conflict with the target goal and objectives identified for natural and working lands in the 2017 Scoping Plan for the State.

Relevant goals and objectives identified for the transportation sector, include electrification and use of low carbon fuels. The 2017 Scoping Plan also identifies existing and planned policies and regulations intended to reduce mobile-source emissions. The vehicles used during preparation and vegetation management activities are required to comply with the applicable GHG reduction programs, including the LCFS and Mobile Source Strategy, for mobile sources. Midpen and the contractor who owns the equipment and vehicles are required to provide verification of compliance to CARB or the USEPA under State and federal law. Midpen's Climate Action Plan includes measures to decrease vehicle related emissions such as by switching diesel-powered trucks and equipment to renewable diesel, a change that was made in 2018. Further actions under the Climate Action Plan include investigating hybrid, electric, or alternative fuel trucks and conducting a pilot project on the viability of these trucks as well as replacing administrative vehicles with electric or hybrid vehicles, which may be implemented during the lifetime of the Program. The Program would conform and not conflict with relevant mobile-source goals, programs, and recommended actions detailed in the 2017 Scoping Plan. The impact would be less than significant.

California Forest Carbon Plan

The Forest Carbon Plan identifies several goals to support the 2017 Scoping Plan's 2030 GHG reduction targets, with a focus on improving overall forest health, enhancing carbon storage resilience, and increasing sequestration. The Forest Carbon Plan promotes and supports the treatment of the State's publicly and privately owned forests to reduce wildland fire risks, primarily through thinning and forest treatments that improve forest health.

One of the applicable stated goals of the plan is to increase the pace and scale of forest and watershed improvements on nonfederal forest lands with a quantitative goal of achieving a rate of forest restoration and fuel-reduction treatments of 60,000 acres per year by 2030 (compared to the average of 17,500 acres per year at the time the plan was developed) and to increase the rate

of all treatment to 500,000 acres per year. The CAL FIRE Vegetation Treatment Plan (CalVTP) and associated Program EIR supports increasing forest treatments by 250,000 acres per year on SRA lands throughout California. Midpen's Program would increase the fuel treatments conducted on their lands from approximately 520 acres maintained under existing conditions to up to 2,630 acres (1,230 acres created, and 1,400 acres maintained) during a maximum implementation year. Prescribed burning would be conducted on an additional up to 500 acres a year. The increase in fuels treatment area would be consistent with the goal to increase treatments across the State on non-federal lands.

The Forest Carbon Plan does not have a specific goal pertaining to carbon sequestration in non-urban forests aside from the goal of preventing forest-land conversions through easements and acquisitions. The plan does, however, discuss and acknowledge that fuel and forest treatments result in short-term forest carbon emissions from equipment and carbon losses through biomass removal but describes in depth how treatments ultimately restore forest health and enable forests to be net sinks of carbon.

Many studies have been conducted to determine whether the short-term carbon loss associated with fuel treatments is offset by the long-term benefit. The results of the studies vary as to carbon levels after treatment and when carbon benefits may be achieved as there are many contributing factors including type and structure of forest and types of treatment methods employed as well as wildland-fire frequency and severity. A study found that prescribed fire-only treatments and mechanical understory-thinning-only treatments resulted in stands that sequestered within 10 years the equivalent of the carbon removed from the forest during treatment. Although other treatment methods studies, including use of a combination of understory thinning and prescribed fire, did not result in a net positive biome productivity due to post-prescribed fire tree mortality[3], the study acknowledges that this method is most effective to reduce wildland-fire risk (Wiechmann, 2015). Another study determined that although aboveground carbon is lost from tree thinning and pile burning, stands that were treated will return to pre-treatment carbon levels between 10 and 34 years faster (i.e., a total of up to 58 to 83 years) following a wildland fire, compared to untreated stands that required up to 93 years (Carlson, Dovrowski, & Safford, 2012). A study found that based on modeling, unmanaged stands store the most carbon if wildland fire events do not occur. However, in the event of a wildland fire under such conditions, vegetation thinning will reduce the quantity of carbon released and increase live tree carbon compared to unmanaged stands (Hurteau, Koch, & Hungate, 2008). Ultimately, fuel treatments are intended to minimize the risk of catastrophic wildland fire in areas with a high fire probability and the associated loss of carbon stocks (Moghaddas, et al., 2018). The Program would involve fuel and forest treatments, including removal and burning of vegetation. A goal of vegetation thinning is to reduce the potential for

[3] The high mortality of large trees following treatment may result from long-term litter build-up at the base of the tree, increasing the risk of cambial and root injury from smoldering combustion (Wiechmann, 2015).

ecologically catastrophic wildland fires. One of the primary methods is to transfer carbon stocks from many small, fire--vulnerable shrubs and trees into resilient large trees. Many of the treatments proposed under the VMP would involve vegetation and tree thinning, including creation and maintenance of fuelbreaks and FRAs as well as removal of fire-prone invasive trees. The PFP would involve prescribed burning as a fuel treatment in grasslands and forest understory. Prescribed burning per studies discussed under Impact GHG-1 would result in fewer carbon emissions per acre than an equivalent wildland fire and these studies conclude that wildland fires ignited in areas without recent treatments, are challenging to contain, leading to larger, uncontrolled burns for longer durations, resulting in far greater GHG emissions. The Program activities would be consistent with the goals of the Forest Carbon Plan and would not conflict. The impact would be less than significant.

2017 Clean Air Plan

As discussed in Section 4.3: Air Quality, one of the goals of the 2017 CAP is to protect the climate by reducing GHG emissions. The specific control measures identified in the 2017 CAP to achieve this goal do not apply to the Program. As shown in Table 4.7-8, GHG emissions generated by Program activities would increase compared to existing conditions. However, as discussed under Impact GHG-1, one of the Program objectives is to decrease wildland-fire risks, which may correlate to lower overall GHG emissions over the long term. The Program would not directly conflict with the 2017 CAP.

County, Midpen, and Other Policies

Midpeninsula Regional Open Space District – Resource Management Policies and Vision Plan

Midpen's policies, as shown in Section 4.7.3: Regulatory Setting, generally support actions that reduce agency-generated GHG emissions and increase carbon sequestration, with specific requirements to reduce administrative GHG emissions. The Program would result in increases in GHG emissions, including increases from equipment used to perform much more intensive vegetation management across the OSPs than is currently performed as well as from prescribed fires. This work is not considered "administrative," so emissions are not subject to goals that limit and reduce GHG emissions in the RM Policies. Generally, increased GHG emissions are not supported by the current RM Policies. To ensure that the Program is consistent with the RM Policies, additional language is proposed (to RM Policy CC-3) to consider trade-offs between carbon sequestration losses from fuel-load reduction and emissions from prescribed fire to establish ecological resiliency, given the benefits of reduced wildland fire risk. The Program is consistent with the RM Policies with this additional language. Impacts from allowing trade-offs between the benefits of prescribed fire and fuel-load reduction and increased GHG emissions are discussed under Impact GHG-1 and Impact GHG-2. The Program would be consistent with the plans and policies, with the proposed additions to the RM Policies, and would further promote ecological resiliency. Impacts would be less than significant.

Midpeninsula Regional Open Space District – Climate Action Plan
The Climate Action Plan implements various climate-action strategies to achieve ambitious administrative GHG emissions reduction. As discussed above, the Program activities would not be considered administrative and, therefore, are not subject to the strategies outlined in the Climate Action Plan. The Program would still, however, be consistent with applicable actions in the Climate Action Plan and support Midpen's GHG emissions reduction actions by operating Midpen-owned equipment and vehicles with renewable diesel instead of fossil diesel, in line with one of the actions implemented as part of the Climate Action Plan to change diesel fuel tanks to renewable diesel. The Program would not conflict with the Climate Action Plan, and impacts would be less than significant.

San Mateo, Santa Clara, and Santa Cruz County General Plans
Midpen lands are located within San Mateo, Santa Clara, and Santa Cruz Counties, and lands within each respective county are subject to the stipulations outlined in the counties' General Plan. The Santa Cruz County General Plan contains policies related to achieving a reduction in GHG emissions; however, due to the age of the General Plan, the specific target to achieve a GHG emissions reduction of 35 percent by 2000 is not relevant to the Program.

The San Mateo and Santa Clara County General Plans describe various policies and implementation measures aimed towards reducing GHG emissions, promoting the expansion of the use of renewable energy, and encouraging the use of clean, low-emissions or alternate fuel vehicles and equipment. As described above, renewable diesel would be used in Midpen'-owned equipment and vehicles and made available, where feasible, to contractor-owned equipment and vehicles during Program implementation, which is consistent with the related General Plan policies. Implementation of the Program would increase GHG emissions, which is generally not supported by the General Plans; however, the General Plan policies also support and emphasize fire prevention and vegetation management efforts (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire). Increased GHG emissions associated with the Program activities would allow for implementation of fuels and vegetation management intended to increase wildland fire resiliency throughout San Mateo and Santa Clara counties. These trade-offs are discussed under Impact GHG-1 and the consistency analysis with the Forest Carbon Plan. Since the Program would reduce potential fire hazard on a large scale, which in turn should reduce emissions associated with wildland fire, implementation of the Program would be consistent with applicable General Plans policies. Impacts would be less than significant.

4.7.6 Mitigation Measures

MM Air Quality-2: Burn Emission Reduction Techniques
See Section 4.3: Air Quality

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4.8 Hazards, Hazardous Materials, and Wildland Fire

4.8.1 Introduction

This section presents the environmental and regulatory setting for hazards, hazardous materials, and wildland fire and evaluates the potential environmental impacts related to hazards that could result from implementation of the Program. Topics addressed in this section include hazardous sites, hazardous materials, and wildland fire hazards. Information on and analysis of asbestos as well as from smoke is included in Section 4.3: Air Quality.

Comments related to hazards, hazardous materials, and wildland fire were received during the public scoping period. Some comments pertaining to these topics were focused on the program design, however, and addressed the need for the Program. A summary of the applicable comments and the location where they are addressed in the hazards, hazardous materials, and wildland fire analysis are provided in Table 4.8-1.

Table 4.8-1 Hazards, Hazardous Materials, and Wildland Fire Scoping Comments

Summary of Comment	Location Addressed
Specific types of existing fire hazards in certain areas of interest.	Section 4.8.2: Existing Environment Section 4.8.5: Impact Analysis
Concern over the overall threats of wildland fire that could be catastrophic for the region under current conditions.	Section 4.8.2: Existing Environment Section 4.8.5: Impact Analysis
Concerns regarding the potential for fuelbreaks to increase wildland fire risk.	Section 4.8.5: Impact Analysis
In areas where vegetation would be cleared to construct fuelbreaks, invasive grasses and other species could proliferate, which could provide fuel for potential wildland fires.	Section 4.8.5: Impact Analysis

4.8.2 Existing Environment

Hazardous Materials and Sites

Hazardous materials are chemical and non-chemical substances that can pose a threat to the environment or human health if misused or released. Explosives, flammable and combustible substances, poisons, radioactive materials, pesticides, petroleum products, and other materials under the Resource Conservation and Recovery Act (RCRA) in 40 CFR part 261 are considered hazardous materials. These substances are most often released during motor vehicle or equipment accidents or chemical accidents during industrial use. Hazardous substances have the potential to leach into soils, surface water, and groundwater if they are not properly contained.

The presence of suspected contamination in and near Midpen lands was identified using the SWRCB GeoTracker and the Department of Toxic Substances Control's (DTSC) EnviroStor databases. There are no listed RCRA or Superfund National Priority Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites, toxic or solid waste landfill sites, facilities with reported toxic chemical releases, or radioactive materials in any OSP or other managed area.

Soil contamination generally occurs in areas that are or have been previously developed, especially with industrial type uses. Soil contamination can also occur in areas where pesticides have been historically applied or mining historically occurred or in areas with underground storage tanks (USTs). Contamination is also sometimes associated with leaking utilities (e.g., leaking petroleum or gas pipelines or leaking transformers on utility poles) or accidental spills. Sites that are currently under Midpen management, or may become under Midpen management, are on undeveloped lands. Remnant contamination from previous industrial uses, particularly in bayside areas, may be present within or near Midpen lands. Some active or abandoned agricultural sites may have residual contamination in soils or have hazardous materials present in containers or tanks. Table 4.8-2 lists the known hazardous materials sites within Midpen lands that are listed on government databases, most of which are closed leaking underground storage tank (LUST) sites.

Only three hazardous materials sites on OSPs remain open as determined by a government database; the former Almaden Air Force Station, Madonna Creek Ranch, and Cooley Landing. A former waste dump is located at the Cooley Landing peninsula within the Ravenswood OSP. Waste, typically construction debris, was repeatedly dumped onto the tideland surface and burned, contaminating the soil (Ninyo & Moore, 2012). The soil and groundwater were found to be remediated to achieve the approved standards and capped with clean soil to allow for use as a public park as of 2012, with some minor additional soil cleanup approved to occur in 2015 (Wolfe, 2012).

The former Almaden Air Force Station (AFS) is in the southern portion of Sierra Azul OSP. The Almaden AFS was a radar station with a ground-to-air transmitter and receiver site. The former facilities used on the site, ranging from fuel-storage tanks to asbestos building materials, led to contamination of the soil and groundwater (Tetra Tech, Inc., 2010). Some of the contaminated areas have been cleaned up to achieve agency remediation standards, but contamination remains on the site (Shahbazian, 2018). The Madonna Creek Ranch site is in the northwestern portion of Miramontes OSP. The area was generally used for agriculture. An historical, unpermitted dump site was uncovered. Sampling conducted in 2019 yielded contamination consisting of lead, nickel, diesel, and the pesticide, dieldrin, in the soil (Rincon Consultants, Inc., 2020). Midpen has conducted remediation at this site to address the contamination (Hébert, 2020).

Several other open and closed hazardous materials sites are located directly adjacent to Midpen lands, such as the National Aeronautics and Space Administration's Ames Research Center site adjacent to the Stevens Creek Nature Study Area, a closed voluntary cleanup site due to past

presence of petroleum hydrocarbons, methylene chloride, and herbicides (i.e., dichlorodiphenyldichloroethane [DDD] and dichlorodiphenyldichloroethylene [DDE]) in the soil.

Midpen is aware of several locations of contamination not listed on government databases and actively conducts cleanup of these sites (Hébert, 2020). Abandoned oil facilities and aboveground storage tanks remain on the Purisima Creek OSP from former oil production. Soil contaminated with oil and diesel was found in and around these facilities, but were determined to not pose a significant threat to the health of users or the environment (Geocon Consultants, 2018). An historic dump site and former village, with possible aboveground or underground storage tanks, is located at Bear Creek Redwoods OSP. Concentrations of lead, zinc, and copper were found in excess of hazardous waste toxicity criteria but due to the use of the site as open space, removal is not recommended (Geocon Consultants, 2019).

Table 4.8-2 Hazardous Materials Sites Within Midpen Lands on Government Databases

OSP	Site Name	Type of Site and Status	Type of Contamination
Sierra Azul	Almaden Air Force Station- Formerly Used Defense Site	Military evaluation	Soil: polychlorinated biphenyls (PCBs), asbestos, Freon, polyglycol
		Military UST site Open remediation	Groundwater: petroleum hydrocarbons, benzene, toluene, xylene
El Corte de Madera Creek	Western States Tanker Spill	LUST cleanup site Completed – case closed	Soil: gasoline
La Honda Creek	Driscoll Ranch	Cleanup program site Completed – case closed	Soil: petroleum hydrocarbons, pesticides, fumigants, herbicides
Pearson-Arastradero	Arastra Hostel	LUST cleanup site Completed – case closed	Soil: heating oil, fuel oil
Rancho San Antonio	Private Residence	LUST cleanup site Completed – case closed	Soil: gasoline
Saratoga Gap	Santa Clara Co. Trans.	LUST cleanup site Completed – case closed	Groundwater: diesel
Bear Creek Redwoods	Presentation Center and Alma College	LUST cleanup site Completed – case closed	Soil: heating oil, fuel oil, diesel Soil, surface water: gasoline

OSP	Site Name	Type of Site and Status	Type of Contamination
Pulgas Ridge	Pulgas Ridge Open Space Preserve	Cleanup program site Completed – case closed	Groundwater: diesel
Miramontes	Madonna Creek Ranch	Cleanup program site Open – assessment and interim remedial actions	Soil: lead, nickel, diesel, dieldrin
Ravenswood	Cooley Landing, Ravenswood Industrial Area	Cleanup program site Open – inactive	Soil: arsenic, polychlorinated biphenyls, polynuclear aromatic hydrocarbons, petroleum hydrocarbons

Source: (SWRCB, 2020; DTSC, 2020)

Current Herbicide Use

Registration

A pesticide is any substance intended to control, destroy, repel, or attract a pest. Pesticides encompass herbicides, insecticides, rodenticides, and fungicides. Herbicides are a common type of pesticide that target weeds and other unwanted plants (DPR, 2014). Herbicides can be used selectively to control specific types of vegetation or non-selectively to clear all vegetation on a particular area.

The process of registering a pesticide (including herbicides) is a scientific, legal, and administrative procedure through which the USEPA examines the:

- Ingredients of a pesticide;
- Particular site or crop where it is to be used;
- Amount, frequency, and timing of its use; and
- Storage and disposal practices.

In evaluating a pesticide registration application, the USEPA assesses a wide variety of potential human health and environmental effects associated with use of the product. The company that is seeking USEPA registration for the herbicide must provide data from studies that comply with USEPA testing guidelines. USEPA then develops risk assessments that evaluate the potential for (1) harm to humans, wildlife, fish, and plants, including endangered species and non-target organisms and (2) contamination of surface or ground water from leaching, runoff, and spray drift (USEPA, 2018). Risk assessment is crucial to the process of making decisions about pesticides, both new and existing. New pesticides must be evaluated before they can be used, and existing herbicides must be re-evaluated periodically to check that they continue to meet the appropriate safety standards (USEPA, 2017). The USEPA also evaluates and approves the language that appears on each pesticide label to ensure the directions for use and safety measures are appropriate to address potential risks. Following label directions is required by law and is necessary to ensure safe use (USEPA, 2018).

The USEPA and individual states register and license pesticides in the U.S. under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). California state laws that regulate pesticides use, which are enforced by the California Department of Pesticide Regulation (DPR), are more restrictive than federal regulations and those of most other states. For example, pre-registration and registration requirements in California are more stringent than in other parts of the U.S. DPR reviews the studies submitted to the USEPA and evaluates their findings, as well as state laws, to determine if additional label requirements or studies are needed.

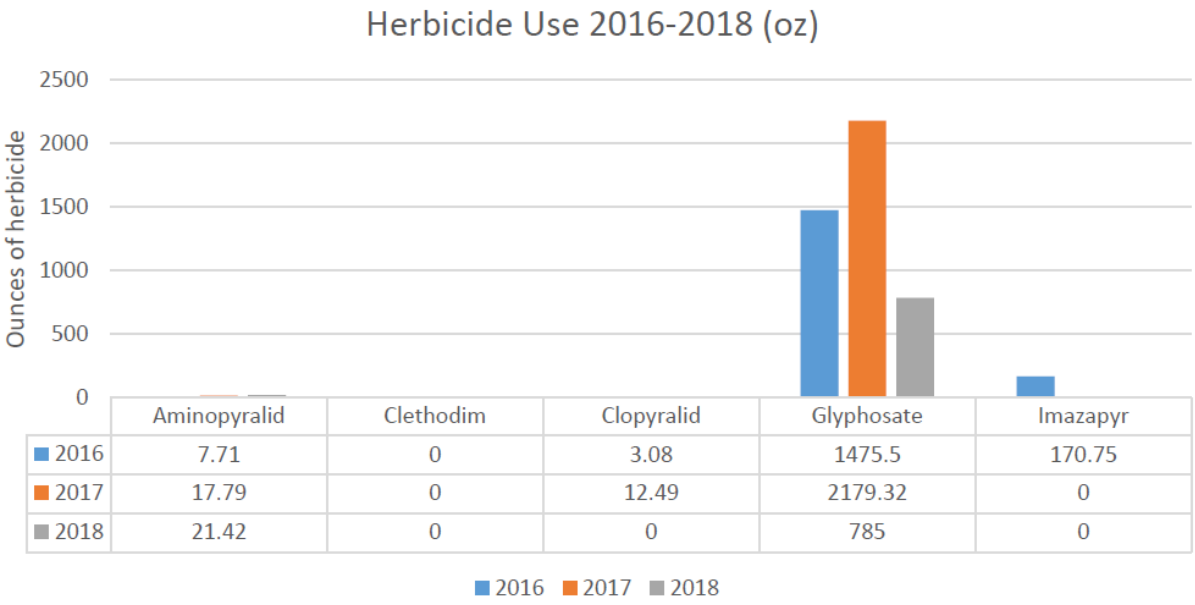
Current Use of Herbicides by Midpen

Herbicides are applied at the direction of a licensed Pesticide Control Advisor and applied to green leaves with a backpack applicator or spray bottle, wick (wiped on), or wand (sprayed on) or applied as pellets to the ground surface. Herbicides are also applied to trees around the circumference of the trunk on the intact bark (basal bark), to cuts in the trunk or stem (a.k.a. "frill and spray"), or to cut stems and stumps (cut stump) or are injected into the inner bark with a hypo-hatchet. The following is a list of herbicides currently used by Midpen:

- Glyphosate (Roundup Custom, Roundup ProMax): non-selective, post-emergent, broad-spectrum weed and tree control
- Aminopyralid (Milestone, Capstone): non-selective, post-emergent, broad-spectrum weed control
- Clopyralid (Transline): selective broadleaf weed control
- Imazapyr (Polaris, Stalker): non-selective, pre- and post-emergent, broad-spectrum weed and tree control
- Clethodim (Envoy Plus): selective post-emergent grass weed control
- Triclopyr (Garlon 4, Capstone): basal cut-stump, basal bark, and dormant-stem treatments for broad-spectrum control of woody plants

Midpen has sought to reduce the per-acre usage of herbicides over time at individual sites. Most sites use an integrated treatment approach, in which initial treatment can consist of increased chemical or mechanical methods and then a shift towards low-intensity manual methods as the infestation becomes under control and the seedbank is eliminated. Figure 4.8-1 and Table 4.8-3 summarize the total herbicides used from 2016 to 2018 and by OSP.

Figure 4.8-1 Herbicides Used in Natural Areas for Habitat Restoration from 2016 to 2018 in Ounces



	Aminopyralid	Clethodim	Clopyralid	Glyphosate	Imazapyr
2016	7.71	0	3.08	1475.5	170.75
2017	17.79	0	12.49	2179.32	0
2018	21.42	0	0	785	0

Source: (Midpen, 2018)

Table 4.8-3 Total Herbicides Used in 2018 Within Midpen Lands

OSP	Herbicide	Total Ounces Used
Bear Creek Redwoods	Roundup ProMax	38
Coal Creek	Roundup ProMax	268
La Honda Creek	Roundup ProMax	156
La Honda Creek	Milestone	1.55
Pulgas Ridge	Roundup ProMax	10
Purisima Creek Redwoods	Roundup ProMax	180
Rancho San Antonio	Roundup ProMax	0.1
Russian Ridge	Milestone	19.9
Skyline Ridge	Roundup ProMax	30
Thornewood	Roundup ProMax	21
Windy Hill	Roundup ProMax	120

Source: (Midpen, 2018)

Prior, during, and after the application of an herbicide on Midpen lands, employees or contractors post signs at the treatment area notifying the public, employees, and contractors of Midpen's use of herbicide.

Public concerns in 2018 prompted Midpen to undergo an in-depth assessment of glyphosate and its use within Midpen's IPMP. This assessment was presented to the Planning and Natural Resources committee on October 9, 2018 (R-18-112), with the conclusion that given careful use of the herbicide, use of personal protective equipment, diligent adherence to Midpen's IPMP BMPs and mitigation measures, and ongoing monitoring by Midpen's IPMP Coordinator, Midpen's use of glyphosate poses a very low risk to staff, visitors, and the environment. Six additional recommendations to further reduce glyphosate use per acre and increase worker and visitor safety were implemented in 2019. These recommendations included the following:

1. Increase field crew training.
   - Ensure all Midpen field crew who perform herbicide treatments have specialized experience and training in herbicide safety, IPMP principles, and special-status species.
   - Evaluate the suitability of securing Qualified Applicator Certificate certifications for additional field staff and implement as appropriate.
2. Re-examine ongoing IPMP projects.
   - Identify suitable sites to shift treatment methods away from glyphosate.
   - Ensure that all projects are performed at the time of year and phenological window for maximum effectiveness, thereby increasing efficiency of current herbicide treatments.
3. Add Garlon 4 Ultra and Capstone to the list of approved herbicides.
   - Garlon is more effective at controlling woody vegetation than glyphosate.
   - Capstone is more effective at controlling some broadleaf weed species than glyphosate.
4. Assess the availability of an alternative herbicide to replace glyphosate. This herbicide would be the safest available broad-spectrum, post-emergent herbicide with minimal residual soil activity.
5. Expand the BMPs that reduce staff and visitor exposure to herbicides.
   - Establish no-spray trail buffers where no herbicides can be sprayed within 5feet of trails, trailheads, or parking lots *unless* a 24-hour trail closure is put into place.
   - Designate "Spare-the-Air" days as no-spray days due to the likely possibility of an inversion layer being present.
6. Implement an annual herbicide literature review of all newly published toxicological research and court proceedings related to herbicides on the IPMP Guidance Manual Approved Herbicides List to inform updates to the IPMP Program.

Toxicity

As with all potentially toxic substances, whether exposure to an herbicide causes harm depends on the dose, how someone is exposed, how sensitive an individual may be to the toxin, and the toxicity of the herbicide involved. People can be exposed to herbicides in three ways: breathing (inhalation exposure), getting it in the mouth or digestive tract (oral exposure), and contact with

the skin or eyes (dermal exposure). Inhalation exposure can happen if someone breathes air containing herbicide as a vapor, as an aerosol, or on small particles such as dust. Oral exposure happens when someone eats food or drinks water containing herbicides. Dermal exposure happens when someone's skin is exposed to herbicides. This exposure can cause irritation or burns. In more serious cases, skin can absorb the herbicide into the body, causing other health effects. Some herbicides evaporate more easily than others, so they are more likely to be inhaled. Some break down quickly on surfaces, others last longer. An herbicide applied as a liquid spray may drift more easily than dry granules depending on meteorological conditions. A dry herbicide plowed into the soil can encounter groundwater but is not as likely to drift through the air. All these factors affect the potential risk of human exposure and are considered when DPR makes rules for herbicide use (Midpen, 2014a).

Sensitive Receptors

Herbicides affect different people differently. Children may be more sensitive to some herbicides than adults. Compared to adults, they breathe in more air and eat more food relative to their body size, increasing their exposure. Also, their developing bodies may not break down some chemicals as effectively as adults. People of any age with asthma or other chronic diseases may be more likely than healthy individuals to get sick after herbicide exposure. Some individuals are also more sensitive to the odor or other irritant effects of certain herbicides. However, people in the greatest danger of herbicide exposure are those whose exposure is highest, such as workers who mix or apply herbicides (DPR, 2014).

Wildland Fire Hazards

Overview

A wildland fire is any non-structure fire, other than a prescribed fire, that occurs in vegetation or natural fuels. Wildland fire is defined as an unplanned, unwanted fire where the objective is to put the fire out (National Wildfire Coordinating Group, 2019), including human-caused fires, escaped prescribed burns, and natural ignitions. A fire can burn exclusively along the forest floor, climb, and consume the tree crown of an individual tree, or reach into and spread through the tree canopy.

Characteristics That Influence Flammability

Wildland fire behavior is influenced by three main factors: weather, fuels, and topography. Wind, temperature, and humidity are important weather variables used to predict fire behavior. Biotic factors that influence flammability of a forest include moisture content in the foliage; size and shape of leaves; retention of dead leaves and branches; spatial arrangement of flammable vegetation; and presence of flammable oils, resins, or other chemicals in leaves or branches. Shrubs and vines can act as fuel ladders, allowing a surface wildland fire to travel up into the tree canopy. Dense forests with minimal horizontal separation between trees can spread flames more quickly (Doran, Randall, & Long, 2004). Fire spreads more quickly during high-wind events and can also create their own wind patterns if they grow large enough. Fires in California are more likely to occur on hot, dry days, most often in the summer or fall during periods of low precipitation. Slope, aspect, elevation, forest density, and large topographic

features such as rock outcroppings influence fire spread. A north-facing slope supports lower fire activity than a south-facing slope but under very dry and windy conditions can burn with high intensities due to higher fuel loading found on these hillsides. Fires burn more rapidly uphill than downhill if sufficient vegetation is available. The steeper the slope, the faster the fire travels in the uphill direction.

Wildland Fire History

Prior to European contact, Native American tribes actively managed vegetation within their communities and surrounding areas in part using prescribed fire. These fires were lit intentionally at various times of the year to enhance vegetation growth, facilitate food collection, and improve forage for the animals they hunted. Native American tribes did not actively suppress lightning ignitions at a landscape scale, which resulted in those fires often burning for days, weeks, and even months, shaping the patterns of vegetation cover and composition over the centuries (Anderson, 2013). A detailed fire history study was conducted in the Santa Cruz Mountains, San Mateo County, Huddart Park, and McGarvey Gulch. These studies found that fires burned redwood forests every 12 years, on average, but shorter and longer intervals (2 to 43 years) without fire also occurred (Stephens & Fry, 2005). These findings are consistent with studies that have documented extensive human- and lightning-caused wildland fire burning in the state of California. The composition of the vegetation in the region was shaped by a variety of disturbance pressures, including fire and grazing by large herds of native ungulate animals.

Most controlled burns by Native American tribes ceased with the beginning of European colonialism (Weir, Conducting Prescribed Fires: A Comprehensive Manual, 2009). When Spanish and Anglo settlers arrived to California, they dramatically changed the management of vegetation communities, particularly grasslands. Major changes to the California landscape included tilling of grasslands for crop production, logging, introduction of cattle herds from Europe, and reduced populations of native grazing animals. The introduction of non-native plants and animals resulted in changes to grassland species composition from primarily perennial, native plant species to annual, non-native plant species. Some non-native species (invasive species) now compete with the native plants in the same ecosystems, reducing the abundance and diversity of native species.

Since 1962, there have been approximately 10 wildland fires that required an official response on lands that are now owned by Midpen. The vast majority of acreage (10,800 acres) burned by these fires occurred when lands in the area of Sierra Azul OSP were in private ownership, including the 1961 Austrian Gulch Fire (5,200 acres), 1985 Lexington Fire (4,961 acres), and the 2009 and 2016 Loma Fires (530 acres between 2009 and 2016). The wildland fire history on Midpen lands is shown in Figure 4.8-2 at the time of the NOP (May 2020). Adjacent wildland fires in San Mateo, Santa Clara, and Santa Cruz counties have also occurred. Since the 1940s, very few large fires have occurred within San Mateo County (CAL FIRE, 2018). Larger and more frequent wildland fires have occurred in Santa Cruz and Santa Clara counties since the 1940s, with several large fires since 2000. In 2014, the greatest causes of identified fire ignitions in Santa Clara County were from vehicles (15 percent) and electrical power infrastructure

(11 percent) (Santa Clara County, 2016). Aside from these fires, and limited prescribed burning up until 2009, the vast majority of Midpen lands have not burned within the last 30 years.

Wildland Fire Hazard on Midpen Lands

Historic land use and management practices have resulted in higher fuel loads on and adjacent to Midpen lands. The policy of fire suppression has further exacerbated the issue, reducing biodiversity on Midpen land. Invasive plant species continue to spread to adjacent, undeveloped grasslands and other plant communities. Since the 1990s, SOD has infected oak woodlands, resulting in succession of habitats and increased fuel loads. Grasslands and oak woodlands are decreasing due to spread of brush and forest species. Coastal scrub and chaparral habitats are aging, with minimal new growth. The understories of redwood and Douglas fir forests as well as the mature oak woodlands have been converted from low-density plants to denser, taller brush and young trees. Second-growth forests feature higher densities of smaller diameter trees than those of old-growth forests.

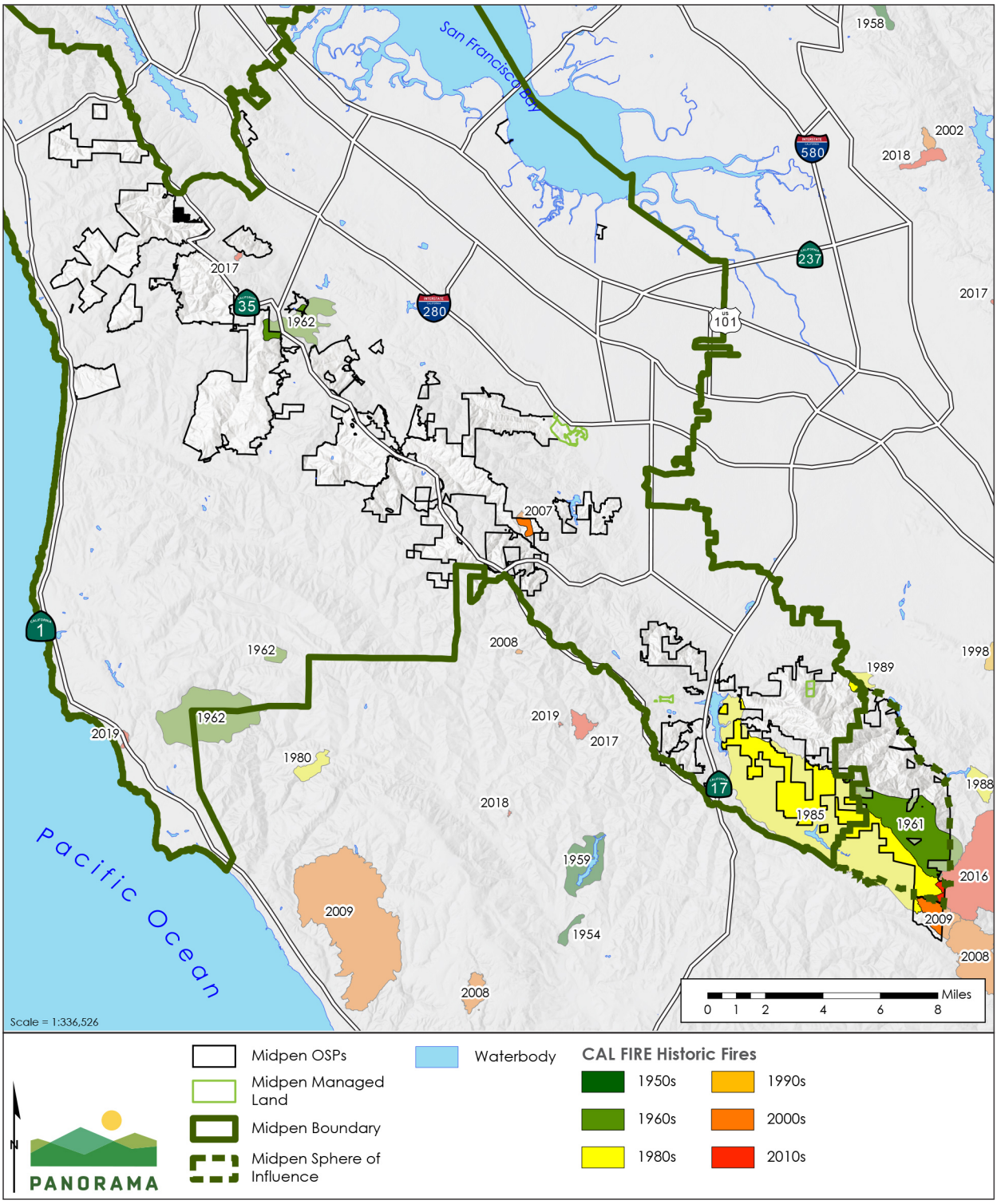
Wildland Fire Hazard Classification in the Program Area

Live and dead fuels have accumulated, creating higher surface fuel loads, thicker vegetation density, and varied species composition from what was seen prior to European contact in many areas. Uncontrolled wildland fire poses the greatest risk to human life and property in the WUI,[1] where houses and businesses meet or intermingle with wildland vegetation. The majority of land owned and managed by Midpen is within the WUI as shown in Figure 4.8-3.

CAL FIRE has mapped areas of significant fire hazards based on fuels, terrain, weather, and other abiotic and biotic factors that influence the occurrence and frequency of wildland fire. These areas as a whole are referred to as Fire Hazard Severity Zones and determine the application of various mitigation strategies to reduce the risk of wildland fires. Areas where fire protection is provided by the State are referred to as State responsibility areas (SRAs), and areas where fire protection is provided by a local agency are referred to as local responsibility areas (LRAs). Most of Midpen lands are located in the SRA with some OSPs within the LRAs as shown in Figure 4.8-3. The fire-hazard severity is mostly rated as high or very high, with some areas designated as moderate fire-hazard severity, as shown in Figure 4.8-4.

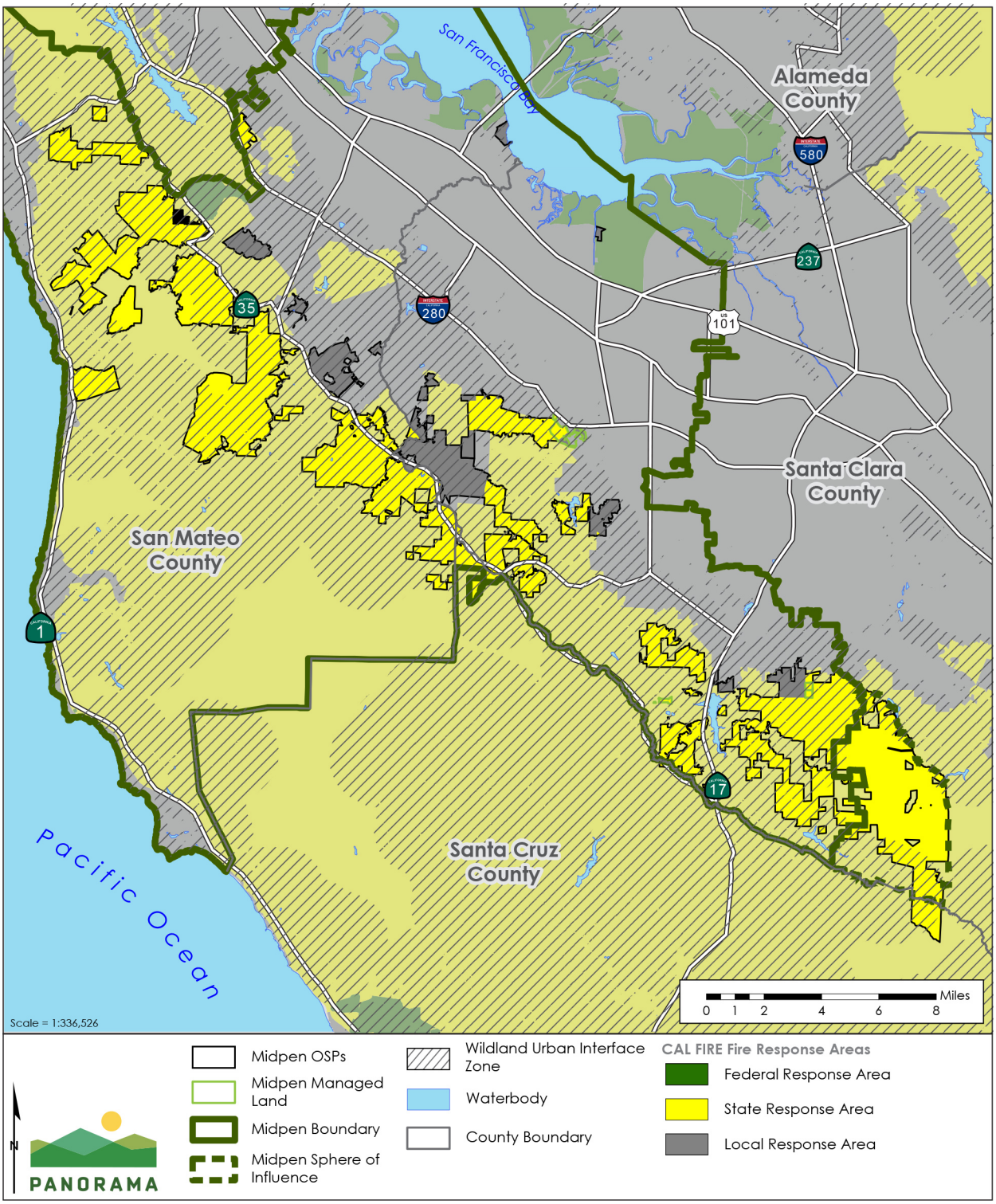
[1] WUI is an area where houses and other structures are built close to, or intermingled with, undeveloped wildlands. The WUI poses significant concern in the event of fire as it combines the characteristics of wildlands (where larger fires generally occur) and developed areas (where lives, homes, and property are vulnerable).

Figure 4.8-2 Historic Fires Within and Surrounding Midpen Lands



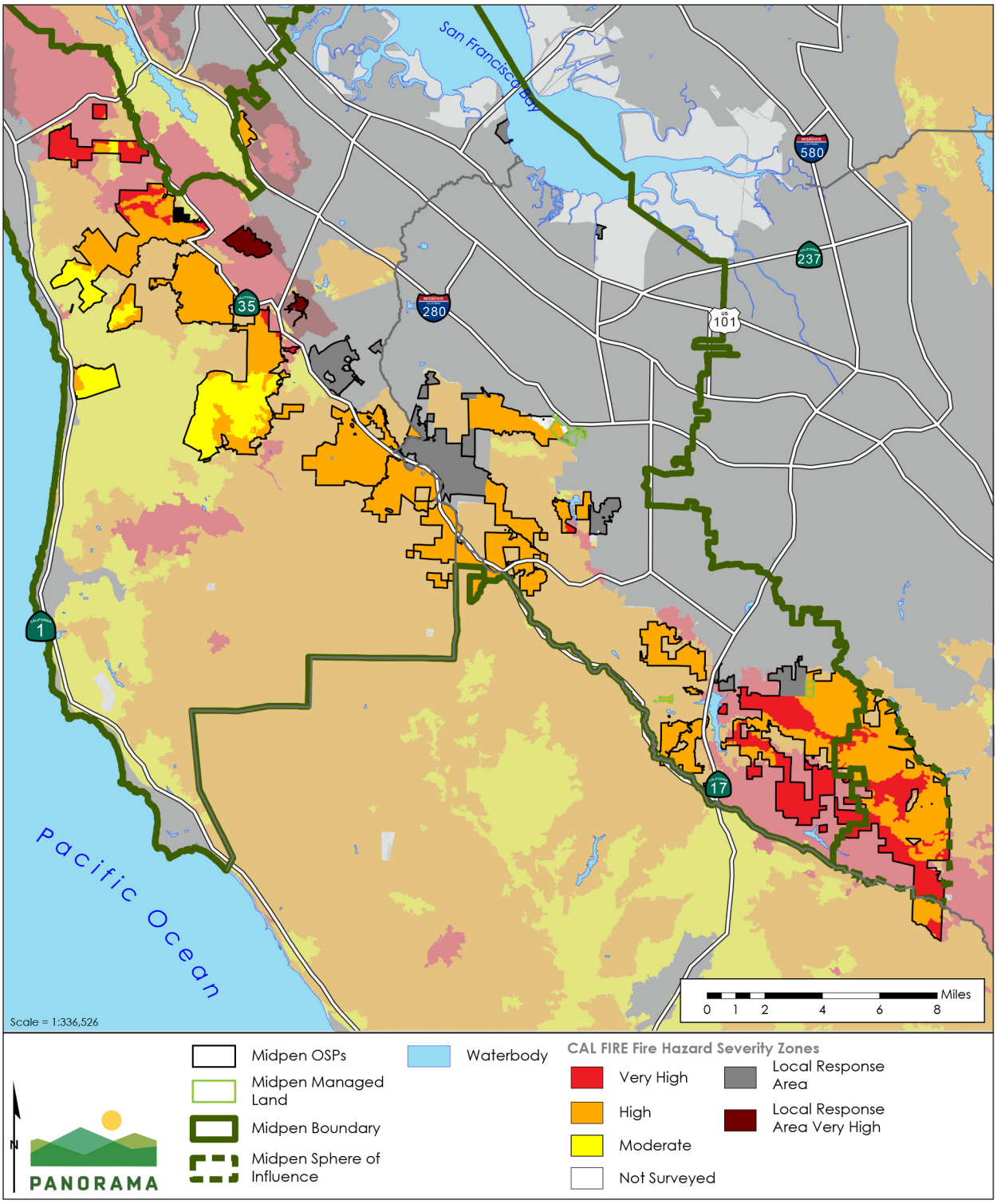
Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; CAL FIRE, 2020)

Figure 4.8-3 CAL FIRE Wildland Urban Interface and Responsibility Areas Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; CAL FIRE, 2020)

Figure 4.8-4 CAL FIRE Fire-Hazard Severity Zones Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019a; CAL FIRE, 2020)

4.8.3 Regulatory Setting

Federal

U.S. Environmental Protection Agency – Hazardous Materials Transportation Act
In 1990 and 1994, the federal Hazardous Materials Transportation Act was amended to improve the protection of life, property, and the environment from the inherent risks of transporting hazardous materials in all major modes of commerce. The U.S. Department of Transportation (USDOT) developed hazardous materials regulations, which govern the classification, packaging, communication, transportation, and handling of hazardous materials as well as employee training and incident reporting.[2] The transportation of hazardous materials is subject to both RCRA and USDOT regulations. This act is relevant to the Program as it dictates the requirements related to hazardous materials associated with vehicle and equipment use and maintenance.

The General Duty Clause requires employers to keep their workplace free of serious recognized hazards. OSHA's Hazard Communication Regulation (29 CFR § 1910.1200) requires that workers are trained and notified of specific hazards associated with hazardous workplace substances. Employees or contractors to Midpen that would handle or work in an area with hazardous materials such as asbestos or fuel as a part of the Program would be subject to these requirements.

U.S. Environmental Protection Agency – Federal Insecticide, Fungicide, and Rodenticide Act
FIFRA is the federal statute that governs the registration sale, distribution, and use of herbicides in the United States. FIFRA authorizes the USEPA to review and register herbicides for specified uses. Before the USEPA may register an herbicide under FIFRA, USEPA must determine that the pesticide "will not generally cause unreasonable adverse effects on the environment." The USEPA also has the authority to suspend or cancel the registration of a pesticide if subsequent information shows that continued use would pose unreasonable risks.

FIFRA was amended by the Federal Environmental Pesticide Control Act in 1972 and the Pesticide Registration Improvement Act of 2003. These amendments strengthened the enforcement provisions of FIFRA, broadened the legal emphasis on protecting health and the environment, regulated the use of herbicides, extended the scope of federal law to cover intrastate registrations, and streamlined the administrative appeals process (USEPA, 2020). Herbicides used as a part of the Program would be approved by the USEPA and comply with the requirements of FIFRA.

U.S. Environmental Protection Agency – Agricultural Worker Protection Standards
The USEPA protects agricultural workers and herbicide handlers from occupational exposure to pesticides through the Worker Protection Standard (WPS). Facilities and institutions that handle

[2] Code of Federal Regulation, Title 49 – Transportation, Parts 171-180.

pesticides must adopt workplace practices designed to reduce or eliminate exposure to pesticides and establish procedures for responding to exposure-related emergencies. Midpen would comply with the requirements of the WPS to protect its herbicide handlers from occupational exposure when applying herbicides as a part of the Program. FIFRA prohibits the use of pesticides that generally pose unreasonable risks to people, including agricultural workers, or the environment. Midpen would not use EPA-prohibited herbicides when implementing the vegetation management practices associated with the Program. USEPA uses the following two primary resources to protect agricultural workers:

1. Pesticide-specific restrictions and label requirements
2. Broadly applicable WPS

If the USEPA believes the risks to workers posed by a pesticide are excessive, it can take actions such as requiring additional label warnings or requiring labeling that mandates use of protective clothing. The WPS specifically addresses how to reduce the risk of illness or injury resulting from occupational exposures to herbicides used in the production of agricultural plants on farms, in nurseries, in greenhouses, and in forests and from the accidental exposure of workers and other persons to such herbicides. The standards establish ventilation criteria, entry restrictions, personal protective equipment guidelines, and information display requirements (USEPA, 2020).

Occupational Safety and Health Standards

OSHA is the federal agency responsible for assuring worker safety in the handling and use of chemicals identified in the Occupational Safety and Health Act of 1970 (Public Law 91-596, 9 USC § 651 et seq.). OSHA has adopted numerous regulations pertaining to worker safety, contained in CFR Title 29. These regulations set standards for safe workplaces and work practices, including standards relating to the handling of hazardous materials. Midpen would comply with all applicable OSHA regulations when implementing the Program, including the safety requirements for handling herbicides.

State

California Public Resources Code Section 21151.4

California PRC § 21151.4 requires the lead agency to consult with any school district with jurisdiction over a school within 0.25 mile of a project about potential impacts on the school if the project might reasonably be anticipated to emit hazardous air emissions or involve the handling of an extremely hazardous substance or a mixture containing an extremely hazardous substance. Herbicide application may occur near schools as a part of the Program, and Midpen would be required to comply with PRC § 21151.4 and consult with applicable school districts.

California Government Code Section 65962.5

California Government Code § 65962.5 requires DTSC to compile and maintain lists of potentially contaminated sites located throughout the State of California. This "Cortese List" includes hazardous-waste and substance sites from DTSC's database, leaking UST sites from the SWRCB's database, solid-waste disposal sites with waste constituents above hazardous waste

levels outside of the waste-management unit, Cease and Desist Orders and Cleanup and Abatement Orders concerning hazardous wastes, and hazardous-waste facilities subject to corrective action pursuant to § 25187.5 of the Health and Safety Code. The list is updated annually and maintained via DTSC's Brownfields and Environmental Restoration Program (Cleanup Program) and is accessible through the EnviroStor online database. Two areas designated as open hazardous materials sites under California Government Code § 65962.5 are present on Midpen lands and would be included in the Program. Midpen would comply with all state mandates and would be subject to the regulations of California Government Code § 65962.5 for these hazardous materials sites.

California Code of Regulations

The California Department of Industrial Relations, which includes the Division of Occupational Safety and Health, protects workers from safety hazards through the CCR. Title 8 of the CCR provides standards for workers dealing with hazardous materials. Workers at hazardous-waste sites, including the two open hazardous-materials sites on Midpen lands, must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos. Several locations within Midpen lands, including the former Almaden AFS, have the potential to place workers at risk from exposure to lead and asbestos contamination. Midpen would comply with the regulations related to lead and asbestos contamination detailed in Title of 8 the CCR. Cal/OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

Title 17 of the CCR requires all air districts in the state to approve a SMP prior to any open burning event (see Chapter 4.3: Air Quality for full description). Prescribed burns implemented under the Program would be subject to compliance with Title 17 of CCR.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

In January 1996, the CalEPA adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. The Unified Program was created to ensure that adherence to established regulatory standards is consolidated, coordinated, and consistent with the enforcement of environmental and release prevention programs. The six program elements of the Unified Program are as follows: hazardous waste generators and hazardous-waste on-site treatment, USTs, aboveground storage tanks, hazardous-material-release response plans and inventories, risk management plans, and Uniform Fire Code hazardous-materials management plans and inventories. The program is implemented at the local level by the Certified Unified Program Agency (CUPA). The USTs and hazardous materials sites on Midpen lands would be regulated by CUPA as a part of the Unified Program.

Defensible Space for Fire Protection

State of California regulations regarding defensible-space requirements are contained in § 4291 of the PRC and § 51182 of the California Government Code. The PRC primarily directs the

creation of defensible space in SRAs, while the California Government Code sets the fuel-treatment requirements in LRAs that are designated as very high hazard-severity zones. Both codes generally include a requirement to maintain defensible space of 100 feet from each side and from the front and rear of structures, but not beyond the property line except under specific circumstances. Structures are located on and adjacent to the Program area to which this code applies.

State Board of Forestry and Fire Protection – 2018 Strategic Fire Plan

The Strategic Fire Plan is one of the Board of Forestry and Fire Protection's preeminent policies. The Board of Forestry and Fire Protection has adopted these plans since the 1930s and periodically updates them to reflect current and anticipated needs. The 2018 plan reflects CAL FIRE's focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services and (2) natural-resource management to maintain the state's forests as a resilient carbon sink to meet California's climate-change goals and to serve as important habitat for adaptation and mitigation. Large portions of Midpen lands are within the WUI, and the Program would work in collaboration with the 2018 Strategic Fire Plan to enhance the protection of lives, property, and natural resources from wildland fire as well as improve environmental resilience to wildland fire through government and community collaboration. The 2018 Strategic Fire Plan has the following goals:

1. Identify and evaluate wildland-fire hazards and recognize life, property, and natural-resource assets at risk, including watershed, habitat, social, and other values of functioning ecosystems. Facilitate the collaborative development and sharing of all analyses and data collection across all ownerships for consistency in type and kind.
2. Promote and support local land-use planning processes as they relate to the following: (a) protection of life, property, and natural resources from risks associated with wildland fire and (b) individual landowner objectives and responsibilities.
3. Support and participate in the collaborative development and implementation of local, county, and regional plans that address fire protection and landowner objectives.
4. Increase fire-prevention awareness, knowledge, and actions implemented by individuals and communities to reduce human loss, property damage and impacts to natural resources from wildland fires.
5. Integrate fire- and fuels-management practices with landowner/land-manager priorities across jurisdictions.
6. Determine the level of resources necessary to effectively identify, plan, and implement fire prevention using adaptive management strategies.
7. Determine the level of fire-suppression resources necessary to protect the values and assets at risk identified during planning processes.
8. Implement post-fire assessments and programs for the protection of life, property, and natural-resource recovery.

Local

Bay Area Air Quality Management District – Regulation 11

BAAQMD Regulation 11, Rule 2 provides stipulations for activities involving handling, transportation, and disposal of asbestos-containing material. Several of the hazardous materials sites on Midpen lands that could contain asbestos would be excavated as a part of the Program. Specific disposal methods for asbestos-containing material are required under Rule 2, and all asbestos-containing waste from Program excavation would be required to be disposed of at waste-disposal sites operated in accordance with this BAAQMD Regulation 11. All vehicles transporting asbestos-containing waste material are required to be marked during the loading and unloading of waste. The signs shall be visible and shall be displayed in such a manner that a person can easily read the legend.

Bay Area Air Quality Management District – Regulation 5

Regulation 5 outlines restrictions and requirements for open burning. It forbids open burning unless burning is exempted outright or conditionally by BAAQMD regulations. Midpen would be required to submit a Smoke Management Plan at least 30 days prior to the proposed burn for prescribed and pile burns as a part of the Program, in accordance with 5-408 of BAAQMD Regulation 5. Additional requirements that apply to prescribed and pile burns in the Program area are as follows:

5-111 **Conditional Exemptions**: The following special conditions must be met for fires allowed by subsections 5-401.1 through 401.17 unless specifically exempted, altered, or further restricted in that subsection, or unless otherwise waived in writing by the APCO [Air Pollution Control Officer] prior to burning, and these conditions shall be complied with during any burning permitted under those subsections. In addition, a condition, requirement, or parameter stated in or imposed by a SMP approved by the APCO may supersede any one of these conditions.

5-111.1 No burning shall take place before 10:00 a.m. local time on any day.

5-111.2 No additional materials or fuel shall be ignited, nor shall any material or fuels be added to any fire after two hours before sunset on any day.

5-111.3 No material or fuel shall be ignited, nor shall any material or fuel be added to any fire when the wind velocity is less than five (5) miles per hour except for crossfiring, or when the wind direction at the site shall be such that the direction of smoke drift is toward a populated area in order to minimize local nuisances caused by smoke and particulate fallouts.

5-111.4 Prior to ignition, all piled material shall have dried for a minimum of 60 days, and be managed to ensure that burning the material does not produce smoke after sunset on any day.

5-111.5 All material to be burned shall be reasonably free of dirt or soil.

5-111.6 Piled material shall be limited to a base area not to exceed 25 square yards and the height shall be at least 2/3 of the average width of the pile.

5-111.7 Ignition material shall be limited to those listed by the State Director of Forestry, as follows: orchard torches; drip torches; pressurized diesel torches; propane or LPG torches; commercial petroleum gel materials, pressurized or solid (napalm or blivets); commercial safety fuses; commercial type ignition grenades, e.g. Fenner, etc.; fuses; commercial fuse lighters and matches. All fires shall be ignited so as to burn as rapidly as possible within conditions of safety and minimum pollution.

5-111.8 Ignition shall be initiated at or near the top of the piled material. No additional material, except ignition material, shall be added to the fire.

5-111.9 Tonnage, volume or acreage of material burned on any given day and/or at any specified site is subject to limitations set by the APCO, but may not exceed any limits set by the ARB.

5-401.6 Hazardous Material: Any fires set for the purpose of the prevention or reduction of a fire hazard, including the disposal of dangerous materials. The fire must be set or allowed by any public fire official having jurisdiction, in the performance of official duty. The fire must, in the opinion of such officer, be necessary, and the fire hazard not able to be abated by any other means. However, these fires may also be conducted to dispose of materials generated to comply with an order or notice issued by a fire official pursuant to Section 4291 of the State Public Resources Code provided all of the following conditions are satisfied:

a. only natural vegetation or other native growth may be burned;
b. the amount of material to be burned shall be greater than 5 cubic yards cleared annually from a single property;
c. the material is burned where it was grown without being moved to a different location unless approved by the APCO;
d. the material is inaccessible for removal by vehicle and available alternatives to burning such as shredding, chipping, composting, disking, plowing, and harrowing are not feasible; and
e. the material, if ignited accidentally, would result in a fire of such magnitude as to immediately threaten life or adjacent improved property or resources and require an excessive fire suppression effort.

No fires involving piled material shall be ignited or take place before 9:30 a.m. local time on any day. Prior reporting pursuant to Section 5-406 must be made to the APCO by the person setting the fire.

5-401.15 Wildland Vegetation Management: Prescribed burning by a state or federal agency, or through a cooperative agreement or contract involving the state or federal agency, conducted on land predominately covered with chaparral, trees, grass, coastal scrub, or standing brush. Any person seeking to set fires under this provision shall comply with the requirements of Section 5-408 and receive written approval of the Smoke Management Plan by the APCO prior to any burn…. Effective June 1, 2002, fires may not be conducted on a day other than a permissive burn day.

5-408 **Wildland Vegetation Management Burn Requirements:** Any person who seeks to conduct or conducts prescribed burning pursuant to subsection 5-401.15 shall comply with the following requirements:

5-408.1 Submit a Smoke Management Plan to the APCO for review at least 30 calendar days prior to the proposed burning that is consistent with the most current USEPA guidance on wildland and prescribed fires (Interim Air Quality Policy on Wildland and Prescribed Fires, USEPA 1998, or any subsequent document that supersedes this document), and provides the following information:

a. location and specific objectives of each proposed burn;
b. acreage, tonnage, type, and arrangement of vegetation to be burned;
c. directions and distances to nearby sensitive receptor areas;
d. fuel condition, combustion and meteorological prescription elements for the project;
e. projected burn schedule and expected duration of project ignition, combustion, and burn down (hours or days);
f. specifications for monitoring and of verifying critical parameters including meteorological conditions and smoke behavior before and during the burn;
g. specifications for disseminating project information to public;
h. contingency actions that will be taken during the burn to reduce exposure if smoke intrusions impact any sensitive receptor area;
i. certification by a qualified professional resource ecologist, biologist, or forester that the proposed burning is necessary to achieve the specific management objective(s) of the plan;

j. a copy of the environmental impact analysis prepared for the plan that includes an evaluation of alternatives to burning, if such an analysis was required by state or federal law or statute;
k. project fuel loading estimate (tons vegetation/acre) by vegetation type(s) and a description of the calculation method; and
l. particulate matter emissions estimate including referenced emission factor(s) and a description of the calculation method used.

5-408.2 … Effective June 1, 2002, permission to burn shall be governed by the acreage burning allocation issued by the APCO.

5-408.3 … Effective June 1, 2002, receive an acreage burning allocation from the APCO prior to ignition.

5-408.4 For each day on which burning occurs, report the total acreage and tonnage of vegetation actually burned to the APCO by telephone no later than 12:00 p.m. local time the following day.

5-408.5 Within 30 calendar days following completion of the burn project, provide a written post-burn evaluation to the APCO that addresses whether the project objectives were met and describes actual smoke behavior.

Effective June 1, 2002, any fire official seeking to conduct prescribed burning in a geographical area considered for a potential naturally-ignited wildland fire managed for resource benefits that is expected to exceed 10 acres in size shall annually register each burn project in writing with the APCO by December 31 each year, with updates as they occur. Once a decision is made to manage the fire for resource benefits, the fire official shall provide a Smoke Management Plan for the burn project to the APCO, upon request (BAAQMD, 2013).

Monterey Bay Air Resources District – Rule 438

Rule 438 outlines restrictions and requirements for open burning within the NCCAB. Prescribed burn projects must be registered with the Air District annually or seasonally and include a completed Smoke Management Plan and a Smoke Management Permit Application Form consistent with the requirements of CCR, Title 17. No person shall set, or permit to be set, any open outdoor fire on any day designated by CARB as a "no-burn" day (MBARD, 2014). Portions of Midpen lands that would be included in the Program are within the jurisdiction of the Monterey Bay Air Resources District. Midpen would be required to comply with Rule 438 when implementing prescribed burns and pile burns on lands within the Monterey Bay Air Resources District.

Midpeninsula Regional Open Space District – Resource Management Policies

Midpen's resource management policies include regulations for the management of natural, cultural, and agricultural resources. These policies are used by Midpen to manage its various lands and open spaces, including those that are a part of this Program. Midpen recognizes the protection against hazards and hazardous materials as one of the primary benefits of open space (Midpen, 2014b). The following goals and policies relate to hazards, hazardous materials, and wildland fire. As part of the Program, several of these policies would be revised and augmented to better support the Program goals of wildland fire resiliency, as summarized in Appendix A to the WFRP. A summary of changes by policy is summarized in parentheses below.

Policy GS-4 Prevent or remediate contaminated soils. Prevent the release of hazardous materials into the environment associated with District operations by implementing and following best management practices (BMPs) for spill prevention.

Goal WF Manage District lands under the concepts of ecological resiliency to reduce the severity of wildland fire and to reduce the impact of fire-suppression activities within District preserves and adjacent residential areas; manage habitats to support fire as a natural occurrence on the landscape; and promote District and regional fire-management objectives.

Policy WF-1 Implement necessary fire- and fuel-management practices to protect public health and safety, protect natural resources, and to reduce the impacts of wildland fire. (Additional details proposed regarding assessing fire hazards by human use and occupancy, reducing roadside vegetation for emergency access as a priority, working with tribal entities, and expanding the fuelbreak system).

Policy WF-2 Aggressively support the immediate suppression of all unplanned fires that threaten human life, private property, or public safety. (Proposed to add to develop a response plan that, in the event of wildfire, allows the District to reduce post-fire impacts and initiate habitat restoration, to designate a Resource Advisor for emergencies, to encourage post-fire assessment and identify areas at risk, to assess pre- and post-fire treatments to refine best management practices and address treatments in high-priority areas, to consider allowing unplanned ignitions to burn where no threats exist and benefit is possible, and to partner with fire agencies and communities to ensure adequate evacuation routes).

Policy WF-3 Work with adjacent landowners and fire agencies to maintain adequate fire clearance around qualifying structures. (Additional details added to implement fire clearances around District-owned structures and to collaborate with fire departments and scientists to educate the public and work to understand trends in fire cause to focus on prevention).

Policy WF-4 Manage District vegetation communities to reduce the risk of catastrophic fire and maintain biological diversity. (Proposed to add promotion of resiliency. Added several details to prioritize ecosystem functions and diversity and promote resiliency; develop the fuelbreaks and fuel-reduction areas recommended in the WFRP; manage communities to maintain diversity of ages and species on roads and ridgetops and near residences and to manage SOD; and use prescribed fire).

Policy WF-5 (Proposed new policy to utilize programmatic documentation to increase the pace and scale of fuel treatments, ensuring that they are performed with the appropriate considerations for biological, cultural, and other natural-resource constraints and to reduce regulatory hurdles to implementation.)

Policy WF-6 Conduct prescribed burns to re-introduce fire into native ecosystems and maintain natural ecological processes on District lands. (Additional details to coordinate with tribes to implement indigenous fire practices and to perform burns using safety processes and protocols, develop burn units based on science, and develop methods for seedling establishment.)

Policy WF-7 Foster and maintain interagency fire-management partnerships. (Additional details to coordinate with tribes and incorporate CWPP recommendations as appropriate and where aligned with District's goals.)

Policy WF-8 Conduct research and monitoring to refine fire-management practices. (Additional details to implement adaptive management to optimize future work, implement dynamic mapping and other methods to share information, utilize technology to monitor conditions, integrate the latest science and research into actions, and collaborate with various entities in the region.)

Policy WF-9 Wildland-fire-management actions on District lands in the Coastside Protection Area will be in accordance with the policies established in the Service Plan for the San Mateo Coastal Annexation Area.

Policy FM-5 Provide necessary fire and fuel-management practices to protect forest resources and public health and safety.

Policy FM-6 Protect forest health from intense wildfire, pests, and pathogens with high potential to cause damage.

San Mateo County – General Plan

Midpen lands, including the ones that are a part of this Program, within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals

and objectives regarding Hazardous Materials Policies in the San Mateo County General Plan are applicable (San Mateo County, 2013):

16.47 **Strive to Protect Life, Property, and the Environment from Hazardous Material Exposure.** Strive to protect public health and safety, environmental quality, and property from the adverse effects of hazardous materials through adequate and responsible management practices.

16.49 **Strive to Reduce Public Exposure to Hazardous Materials**. Strive to reduce public exposure to hazardous materials through programs which (1) promote safe transportation, (2) prevent accidental discharge, and (3) promote effective incident response, utilizing extensive inventory and monitoring techniques.

Santa Clara County – General Plan

Midpen lands, including the ones that are a part of this Program, within Santa Clara County are subject to the stipulations outlined in the Santa Clara County General Plan. The Safety and Noise Chapter and the updated 2015 Health Element of the Santa Clara General Plan includes policies providing guidelines for hazards, hazardous materials, and wildland fire. The strategies and policies that may apply to the Program are listed below:

Strategy #1 Manage Hazardous Materials Safely and Efficiently

Strategy #2 Ensure the Adequacy of Local Hazardous Waste Treatment Facilities

C-HS 14 All feasible measures to safely and effectively manage hazardous materials and site hazardous materials treatment facilities should be used, including complying with all federal and state mandates.

C-HS 15 To achieve a more effective, efficient and economical regulatory environment, all feasible means to simplify and coordinate locally implemented hazardous materials management regulations should be considered.

R-HS 23. Areas for which inadequate access is a general concern, either due to lack of secondary access, dead-end roads of excessive length, and substandard road design or conditions, should be examined to determine if there are means by which to remedy the inadequacies. Such means may include:

1. Specific local area circulation plans to establish alternative access;
2. Specific roadway improvements to remedy hazardous situations, financed by those most benefited by the improvements; and
3. Traffic routing and controls to discourage the use of such roads by non-residents.

R-HS 33 For areas where it may be appropriate, fire protection agencies and districts should utilize controlled burns and other forms of vegetation management to reduce the buildup of vegetative matter and the potential fire hazard within an area.

HE-G.13 **Fire prevention**. Support state, federal, County, and other local efforts to prevent wildfires. Emphasize prevention cost-efficiency over that of ever-increasing expense of fighting and suppressing wildfires (Santa Clara County, 1994; Santa Clara County, 2015).

Santa Cruz County – General Plan

Midpen lands, including the ones that are a part of this Program, within Santa Cruz County are subject to the stipulations outlined in the Santa Cruz County General Plan. Chapter 6, Public Safety and Noise, of the Santa Cruz County General Plan contains the following policies related to the Program for scenic protection:

6.6.1 **Hazardous Materials Ordinance**. Maintain the Santa Cruz County Hazardous Materials ordinance, placing on users of hazardous and toxic materials the obligation to eliminate or minimize the use of such materials wherever possible, and in all cases to minimize the release, emission, or discharge of hazardous materials to the environment, and properly to handle all hazardous materials and to disclose their whereabouts. Further, maintain the County's ordinance relating to ozone-depleting compounds. Ensure that any amendment of existing ordinance provisions is based on a finding that the amendments will provide protection to the environment and the community against toxic hazards that is equal to or stronger than the existing provisions.

6.6.2 **County Use of Toxic/Hazardous Materials**. Eliminate wherever possible, and minimize where elimination is not feasible, the use of hazardous and toxic materials in the operations and programs of Santa Cruz County government (Santa Cruz County, 1994).

Santa Cruz County – Fire Code

The Santa Cruz County Fire Code (SCCC Chapter 7.92), which adopts the 2019 California Fire Code, regulates the safeguarding of life, property, and public welfare from the hazards of fire, hazardous-materials release, and explosion arising from the storage, use, and handling of hazardous materials, substances, and devices; conditions hazardous to life or property including construction, occupancy and use of buildings and premises, equipment; and provision of adequate safe access (Santa Cruz County, 2019). Midpen lands within Santa Cruz County are subject to compliance with the Santa Cruz County Fire Code, which determines the open-burn season for the county, and the Program would comply with the applicable regulations for those areas.

4.8.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on hazards, hazardous materials, and wildland fire would be considered significant if they would exceed the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school;
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, create a significant hazard to the public or the environment;
- Result in a safety hazard or excessive noise for people residing or working in the plan area, for a plan located within an area covered by an airport land-use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public-use airport;
- Impair implementation of or physically interfere with an adopted emergency-response plan or emergency-evacuation plan; or
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

If located in or near state responsibility areas or lands classified as very high fire-hazard severity zones:

- Substantially impair an adopted emergency-response plan or emergency-evacuation plan;
- Exacerbate wildland fire risks and thereby expose project occupants to pollutant concentrations from a wildland fire or the uncontrolled spread of a wildland fire due to slope, prevailing winds, and other factors;
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes.

(See CEQA Guidelines, Appendix G, I.)

Analysis Methodology

The analysis presented in this section was performed using qualitative methods that involved identifying the hazardous materials that could be used and then determining the potential for causing impacts on the environment from their use based on the tools and techniques needed and the various fire management activities proposed. Vegetation management activities would occur in SRAs and in areas designated as very high fire-hazard severity zones. As this is the case, all wildland fire resource questions are analyzed.

Hazards from herbicide use were assessed based on the types and quantities of herbicides currently being used by Midpen and how the implementation of the Program would change baseline conditions. This analysis considers the range and nature of foreseeable herbicide use, storage, and disposal resulting from the Program and identifies the primary ways that herbicides could expose individuals or the environment to health and safety risks.

The analysis of fire hazards was also performed qualitatively. Many studies have been conducted on the efficacy of fuel treatments including thinning and prescribed burns to reduce the risks associated with and that alter the behavior of subsequent wildland fire. Fuel treatments may not necessarily minimize the frequency of wildland fire ignition, but fuel treatments have been shown to reduce fire intensity and severity. Several studies have found a combination of mechanical thinning from below and prescribed fire of surface fuels to reduce potential wildland fire severity, even under extreme weather conditions (Stephens, et al., 2012; Moghaddas, et al., 2018). Studies point to a short-lived effect of prescribed burning on rate of wildland fire spread generally disappearing as soon as the fuel complex regains its pre-burn structure (within 2 to 5 years after prescribed fire). The overall benefits of prescribed burning, namely in avoiding crown fire or substantially reducing the potential for its occurrence, should persist for longer periods, since the understory vegetation layer build-ups at a lower rate. Studies have found evidence of wildland fires stopped or slowed by previous prescribed fires, improved fire control operations due to the existence of fuel-reduced areas and reduced fireline intensity, effective protection of assets, and less overall demand for firefighting resources extended through 5 years after the treatments. Fuel reduction burning in the last 10 years can still influence fire behavior and assist in fire suppression, even if the most observable benefits, including on wildland fire propagation and fire suppression, were studied to occur within 2 to up to 5 years after the treatment (Fernandes & Botelho, 2003). Fire modeling was not performed as it is assumed that any work performed under the Program (e.g., maintenance and creation of fuelbreaks, prescribed burning, installation of firefighting infrastructure) would generally serve to decrease fire risks over the existing conditions.

Program activities would not result in a significant increase in introduction of invasive species that may be associated with an increase in fire occurrence and frequency, with implementation of mitigation. Refer to Section 4.4: Biological Resources for an analysis of the potential for introduction and spread of invasive species and how the impact is mitigated.

Fire-management activities that include the use of equipment or vehicles could generate sparks that could spread into a wildland fire. Prescribed burning, if escaped, could also generate a

wildland fire. Ignition of any wildland fire, no matter the size, fuel type, or rate of spread, is assumed to be a potentially significant impact. Measures are included to avoid accidental initial ignition of fires by workers even though the risks are very low. Implementation of the Program would help to reduce the potential size and intensity of a wildland fire over existing conditions by reducing the fuel loads on Midpen lands and improving firefighting capabilities.

4.8.5 Impact Analysis

	Significance Determination
Impact Hazards-1: Significant hazard to the public or the environment through emission of or exposure to hazardous materials.	**Less than significant**

Overview

Vegetation-management activities would involve the use of vehicles and equipment, which could result in the leakage or spillage of fuels. Large spills could occur during fueling or at work sites. Prescribed and pile-burning activities would require the use of drip torches, which could also leak fuel, but in very small quantities. Chemical methods would involve limited and controlled use of some herbicides to minimize fuel loads and invasive species. Improper cleanup or handling of fuels, chemicals, and other hazardous materials could result in impacts on workers, the public, or the environment. Midpen lands traverse numerous counties and are subject to compliance with various local laws and ordinances when handling hazardous materials, including the Santa Clara County, San Mateo County, and Santa Cruz County General Plans. Midpen would adhere to these local regulations when implementing the Program.

Analysis of Tools and Techniques

Manual and Mechanical Techniques

Mechanical methods of vegetation removal would include the use of heavy machinery, such as excavators, skid steers, and other heavy equipment. The use of equipment for vegetation-management activities within Midpen lands could lead to fuel leaks and spills. If a fuel or hydraulic-fluid spill were to occur into a waterbody, waterway, or sensitive habitat, a significant impact could occur. Trucks, vehicles, and heavy equipment are used for ongoing management under existing conditions on Midpen lands. Workers handling hazardous materials are required to adhere to OSHA and Cal/OSHA health and safety requirements to protect workers, as described in Section 4.8.3: Regulatory Setting. Vehicles would be kept in good working order. Midpen is required to have a Spill Prevention Control and Countermeasures Plan to cover the fuel-storage tanks at the two Midpen field offices and associated operations, including refueling. Smaller equipment, such as chainsaws, could be fueled in the field. Since compliance with these existing regulations and programs is mandatory, routine transport, uses including refueling of equipment and vehicles and disposal of hazardous materials are not expected to pose a significant hazard to the public or the environment. Leaks and fuel spills from refueling at work sites or fueling areas could pose a significant hazard to the public or the environment. Spills and accidental release of fuels are

generally localized and would not affect any nearby schools. Fueling and any fuel spills would be handled according to Midpen's spill-prevention and handling of hazardous materials BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). These BMPs would ensure that hazardous materials are properly stored on site and that any accidental releases of hazardous materials would be properly controlled and quickly cleaned up. Impacts would be less than significant with implementation of the BMPs.

Propane flaming would be used on seedlings and annual plants in a small area. Less than one gallon of propane fuel would be needed to treat one acre (Wildung, 2001). Fuel would be contained within a propane torch and applied from an ATV or backpack. Large quantities of propane would not be transported or used at any one time. Pile burning of cut vegetation would be lit with a mixture of diesel and gasoline fuel in a drip torch or other similar tool. This fuel would likely be transported to the burn site in a gas can in the back of a truck. Due to the small quantity of fuel needed, any spills would not pose a significant hazard to the environment. Impacts from flaming or pile burning would be less than significant.

Chemical Application

Herbicides are currently used on Midpen lands under the IPMP. The herbicides proposed for use as part of the Program are the same as those already analyzed and are covered by the IPMP EIR and Addendum (Midpen, 2014a; Midpen, 2019b). No new herbicides are proposed for use. The toxicity of each of the herbicides has already been analyzed in the IPMP and found to have a moderate to very low toxicity to humans. Chemical use across Midpen lands would increase for Program implementation due to increased acreage for treatment, but the majority of wildland fire management would be conducted using the other methods such as manual and mechanical methods.

The increased use of herbicides could expose more applicators and workers to hazards as well as indirectly affect family members and the public, such as nearby residents, recreationalists, or passersby on roadways. Table 4.8-4 provides an overview of the potential for significant human toxicity from each of the herbicides that could be used under the program.

Table 4.8-4 Human Toxicity of Chemicals Proposed for Use under the Program

Herbicide	Human Toxicity
Glyphosate (Roundup Custom, Roundup ProMax)	Overall low toxicity. Skin and eye irritation possible. No evidence of neurotoxicity, immunotoxicity, or acute toxicity. Reproductive toxicity at very high doses. Recent claims of carcinogenicity (class 2A) based on animal studies. Unvalidated claims. Very low toxicity via oral and dermal routes. Possible endocrine disruptor. [a]
Aminopyralid (Milestone, Capstone)	Very low toxicity if accidentally ingested, touched, or inhaled. Aminopyralid did not result in skin sensitization when tested on guinea pigs or in skin irritation when tested on rabbits. Aminopyralid by itself caused eye irritation in rabbits, but in the Milestone product formulation it did not.

Herbicide	Human Toxicity
Clopyralid (Transline)	Very low toxicity if ingested. Clopyralid is classified by the USEPA as "not likely to be a human carcinogen." Clopyralid caused birth defects in laboratory animal studies at doses that were severely toxic to the mother. No birth defects were observed in animals given clopyralid at doses several times greater than those expected during normal exposure. Not mutagenic (capable of changing genetic material [DNA] of an organism).
Imazapyr (Polaris, Stalker)	Overall low toxicity. No evidence of carcinogenicity, neurotoxicity, immunotoxicity, or reproductive/developmental toxicity. Slightly toxic via acute oral, dermal, and inhalation routes. No evidence of carcinogenicity or mutagenicity.
Clethodim (Envoy Plus)	Overall low toxicity. Exposure to Clethodim may cause moderate skin irritation and mild eye irritation. Clethodim has been adequately tested for carcinogenicity as well as reproductive and developmental effects, and no adverse effects have been noted.
Triclopyr (Garlon 4, Capstone)	Overall low toxicity (moderate toxicity if ingested) (technical triclopyr acid). Slightly toxic via acute oral, dermal, and inhalation routes (TEA and TBEE). Slightly toxic by acute oral and dermal routes. Practically nontoxic by inhalation. Not carcinogenic (technical triclopyr acid). Slightly toxic via acute oral, dermal, and inhalation routes (TEA and TBEE). Slightly toxic by acute oral and dermal routes. Practically nontoxic by inhalation. Not carcinogenic.

Note:

[a] There have been court cases involving Roundup, and the juries in these cases have awarded several million dollars to plaintiffs. However, decades of actual laboratory and field testing of glyphosate conclude that glyphosate is not likely to be carcinogenic to humans and that no other meaningful risks to human health occur when the product is used according to the label.

Sources: (Washington State Department of Transportation; USDA, 2014; CAL FIRE, 2019)

As shown in Table 4.8-4, most of the herbicides used for increased use under the VMP pose low levels of toxicity to humans; however, some can result in skin and eye irritation or can be slightly toxic if exposure occurs. As discussed above in Section 4.8.3: Regulatory Setting, the USDOT, in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to the transportation of hazardous materials. The USEPA oversees herbicide use and health and safety through the WPS. The WPS contains requirements to minimize risk to herbicide applicators, including use of personal protective equipment, restricted-entry intervals after herbicide application, decontamination supplies, and emergency medical assistance. Compliance with the WPS, OSHA, and Cal/OSHA would minimize risk to workers and indirectly to family members.

A significant portion of Midpen lands is within the WUI, and the risk to the public and the environment from overspray or spray drift could still occur, resulting in a significant impact. PRC Section 21151.4 requires agencies to notify school districts if any hazardous materials are planned to be handled or used within 0.25 mile of a school. Midpen would comply with PRC Section 21151.4 and consult with all applicable school districts, including but not limited to the Cabrillo Unified School District, La Honda-Pescadero Unified School District, and Los Gatos Union School District, prior to herbicide application within 0.25 mile of any schools.

All herbicides used as a part of the Program would have labels with instructions on how to properly use the product, the intended target plants, and precautions applicators must take to protect human health and the environment. These precautions could include weather parameters (e.g., wind speed to avoid drift and precipitation to minimize unintended runoff). Herbicides must be applied under the guidance of licensed and certified personnel and according to Midpen's recommendations and herbicide label requirements; applicators must use appropriate protective equipment; a 5-foot no-spray buffer must be established or the area closed for 24 hours; that application must be conducted so as to avoid drift; and storage, handling, and disposal of herbicides must be conducted appropriately (IPMP BMPs 7, 9, 10, 34, 35; MO Manual Section 17.005 and 17.006). Implementation of the Midpen requirements and proper herbicide application following label instructions would minimize the potential for unwanted adverse impacts on humans and the environment. The culmination of the protective measures and regulatory requirements provides a foundation for assuring the most effective, yet relatively safe, use of herbicides when treatment is determined to be needed. Herbicide application is only performed using spot treatments, such as from backpack sprayers. No aerial applications that require larger quantities and can generate drift would be used, as consistent with policies in the IPMP. Midpen's and the numerous other regulatory requirements for herbicide use provide a foundation for assuring effective, yet relatively safe, use of herbicides when treatment is determined to be needed. The impact associated with use of herbicides under the Program would be less than significant.

Prescribed Herbivory

Livestock would be enclosed in a fenced area. If a generator were used to operate an electric fence, some fuel would be needed, which could leak during refilling or operation. Any spills would be small and addressed by implementation of Midpen's spill-prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Impacts from prescribed herbivory would be less than significant.

Prescribed Burning

Up to 3 gallons of fuel may be needed for drip torches during a prescribed burn (for a burn project of approximately 20 acres in size) (Stevens, Aljoe, Forst, Motal, & Shankles, 1997). Any spills during drip-torch refilling, if needed, would be generally small and not pose a significant impact on the environment or the public. If a spill were to occur, it would be addressed through implementation of Midpen's spill-prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Impacts would be less than significant.

Access and Vehicle Travel

Vehicle travel to and from work areas within Midpen lands could result in a minimal risk of accidental spills of fuels or lubricants from these vehicles. Leaks and spills would be addressed by implementing Midpen's spill-prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Impacts would be less than significant.

Analysis of Plans

Vegetation Management Plan

New VMAs would be created and maintained and continued maintenance of existing fuelbreaks and defensible spaces would occur. Equipment used for cutting vegetation, mulching, chipping, or pile burning could leak or spill. Risks of spills in work areas would be similar to, but increased, compared to existing conditions due to the increased level of vegetation management activity that would occur under the VMP. Some of the VMAs would be created or maintained in steep terrain on Midpen lands, where some increased risks for fuel or hydraulic-fluid spills (such as from a vehicle accident or roll over) could occur. Use of heavy equipment is generally restricted to sites with 30-percent slopes or less, minimizing this risk. Midpen would conduct activities in compliance with regulations to minimize risks of spills and accidents, and quantities transported would be small. Vehicles would travel along established roads to also minimize the potential for accidents. If a fuel or hydraulic-fluid spill were to occur into a waterbody, waterway, or sensitive habitat, a significant impact could occur. Fueling and any fuel spills would be handled according to Midpen's spill-prevention and handling-of-hazardous-materials BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Improper handling, storage, or leaks of herbicides could pose a significant hazard. Implementation of the Midpen requirements would minimize the potential for unwanted adverse impacts on humans and the environment from herbicide use and application (IPMP BMPs 7, 9, 10, 34, 35; MO Manual Section 17.005 and 17.006). The impact would be less than significant.

Prescribed Fire Plan

Equipment and vehicles would be used during pre-treatment, the burn, and mop up of the burn. Leaks and spills could occur, posing a significant impact on the environment. Fueling and fuel spills would be handled according to the Midpen's spill-prevention and handling-of-hazardous-materials BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Implementation of the Midpen requirements would minimize the potential for unwanted adverse impacts on humans and the environment from herbicide use and application (IPMP BMPs 7, 9, 10, 34, 35; MO Manual Section 17.005 and 17.006). The impact would be less than significant.

Wildland Fire Pre-Plan

Installation or construction of firefighting infrastructure would involve use of vehicles and equipment, which could leak or spill hazardous materials. Fueling and fuel spills would be handled according to the Midpen's spill-prevention and handling-of-hazardous-materials BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Implementation of the Midpen requirements would minimize the potential for unwanted adverse impacts on humans and the environment from herbicide use and application (IPMP BMPs 7, 9, 10, 34, 35; MO Manual Section 17.005 and 17.006). The impact would be less than significant.

	Significance Determination
Impact Hazards-2: Hazard to the public or the environment related to project area located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5.	**Less than significant with mitigation**

Midpen lands encompass several locations designated as hazardous-materials sites under California Government Code Section 65962.5. The majority of the hazardous-materials sites on Midpen lands are historic LUSTS that have been cleaned up and declared closed. Three hazardous-materials sites listed on government databases remain open on Midpen lands at Sierra Azul OSP, Miramontes OSP, and Ravenswood OSP. Midpen would comply with all state mandates and would be subject to the regulations of California Government Code Section 65962.5, Unified Hazardous Waste and Hazardous Materials Management Regulatory Program, and the Hazardous Waste Control Act for these hazardous-materials sites.

Program activities are unlikely to occur around the Cooley Landing site at Ravenswood OSP. The VMP would involve some fire-management activities in and around the area of the former Almaden AFS in Sierra Azul OSP and the Madonna Creek Ranch site in Miramontes OSP. Midpen is currently conducting restoration of the Mount Umunhum radar tower, which ultimately will ameliorate the risks to the public and workers from lead and asbestos contamination adjacent to and within the structure in the future. Midpen is also undergoing remedial actions at the Madonna Creek Ranch site. Creation and maintenance of fuelbreaks and defensible space around infrastructure could occur in and around the former Almaden AFS. Eucalyptus and acacia removal could occur in and around the Madonna Creek Ranch site. Some firefighting infrastructure could be installed as well, due to the existing helicopter LZ at Sierra Azul OSP and the accessibility of both areas. Ground-disturbing activities in and around former buildings and facilities within the former Almaden AFS has the potential to place workers at risk from exposure to lead and asbestos contamination. Contaminated soil and materials at any of the sites could be accidentally distributed into areas of clean soil. Area of contamination could be uncovered and erode into water ways. As Midpen purchases or is gifted new land, new areas of contamination listed on government databases could be located in areas that would have Program activities conducted. Disturbance of contamination at these sites could pose a significant hazard to the public, workers, or the environment. Midpen would comply with applicable federal, state, and local regulations, including the Hazardous Materials Transportation Act, Title of 8 the CCR, and BAAQMD Regulation 11, Rule 2, when handling asbestos-containing material. MM Hazards-1 would reduce impacts by requiring preparation of a map showing the areas of residual contamination within the sites listed on government databases (e.g., former Almaden AFS) prior to any fire-management activities and avoidance of all contaminated areas unless they are remediated in the future and no hazardous materials remain. The impact on workers and the environment from existing hazards would be less than significant with mitigation and compliance with applicable hazardous-material regulations.

Impact Hazards-3: Safety hazard or noise related to project area located within an area covered by an airport land-use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public-use airport, affecting people residing or working in the project area.	Significance Determination
	No impact

The majority of Midpen lands are not located within an area with an airport land-use plan or within the vicinity of a private airstrip. Ravenswood OSP is within 2 miles of the Palo Alto Airport but is not within the airport-influence area (Santa Clara County ALUC, 2016). Implementation of the Program would not result in a safety hazard from being located within an adopted airport land-use plan or near public airports or private airstrips. No impact would occur. Prescribed burning is maintained at low intensities that would not generate sufficient smoke to affect air traffic.

Impact Hazards-4: Impairment of implementation or physically interference with an adopted emergency-response plan or emergency evacuation plan.	Significance Determination
	Less than significant with mitigation

Designated primary and secondary evacuation routes pass through or adjacent to most Midpen lands (refer to Appendix 3.0 for a map set showing the routes). Fire-management activities such as prescribed burning or conducting roadside mowing may require lane or full-road closures that could interfere with evacuation along designated routes on Midpen lands. Hindering evacuation and emergency response could be a significant impact. MM Transportation-1 requires Midpen to make provisions to be able to allow emergency responders through any work area or clearly designate alternate routes. Minimal delays, lasting a few minutes, would occur while crews reposition equipment and vehicles to ensure adequate room for emergency vehicles to pass. MM Transportation-1 would ensure that unattended authorized work vehicles are not parked in such a way that blocks the road when there are no operators in attendance to move them and that the fire district and emergency-response agencies have prior notification of temporary access road closures. The impact would be less than significant with mitigation.

Impact Hazards-5: Exposure of people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	Significance Determination
	Less than significant with mitigation

Overview

The purpose of the Program is, in large part, to reduce fuel loads and wildland-fire risks on Midpen lands compared with the baseline conditions. The Program activities, including vegetation management and prescribed burning, would decrease the risk of extreme wildland-fire behavior, slow the spread of a wildland fire, and aid in the suppression and control of a wildland fire. Implementation of the Program at any level would have beneficial effects with regard to reducing wildland-fire risks or the size and spread of wildland fires, were one to break out. The Program would comply with section 4291 of the PRC and section 51182 of

the California Government Code, which direct the creation of defensible space in SRAs and sets the fuel-treatment requirements in LRAs, respectively. Enhancement of defensible space around existing structures and additional fuel treatments would reduce fire risk within Midpen lands. Compliance with these two state regulations would future reduce the risk of wildland fires.

Several of Midpen's RM Policies related to wildland fire are also proposed for revision as part of the Program. The revisions support the goals and thus the actions of the WFRP. No additional environmental impacts would result from these revisions to the RM Policies beyond what is assessed here as the activities under the Program. The mitigation presented here would minimize effects of the Program to ensure that the actions are consistent with the revised RM Policies.

Some activities could increase some risks of wildland-fire ignition and spread during the actual performance of work, which requires the use of vehicles and equipment that could ignite a fire through generation of sparks or heat. Certain parts of Midpen lands could be more susceptible to fire ignition and spread, such as areas on steep slopes, south-facing slopes, and areas where significant fuel is found (e.g., dead trees and thick understories of weeds). Pile and prescribed burns also have a higher potential for starting a wildland fire were the burns to become uncontrolled. This section focuses on the fire-ignition risks of each tool and technique proposed for use as part of the Program as well as the risks from each plan. Risks can be reduced through consistent application of fire-prevention techniques and through avoiding high-risk areas or scenarios (e.g., hot, dry, windy days).

Analysis of Tools and Techniques

Manual and Mechanical Techniques

Hand Tools and Equipment

Manual methods of vegetation management include pulling weeds by hand or using hand tools to remove weeds. These techniques have a very low risk of igniting a fire due to a lack of ignition source in the method. Mechanical methods of vegetation management would include the use of heavy equipment and machinery for cutting, mowing, propane torching of seedlings, and removal of vegetation. Heat or sparks from equipment could ignite dry vegetation and result in an unintended fire.

Heavy equipment is already in use on Midpen lands. Midpen crews conducting the vegetation management activities have the potential to ignite a fire as well. The greater intensity and widespread nature of work proposed in the Program could increase the risk of ignition. The ignition of any fire is considered a significant impact as it could turn into a wildland fire. Most equipment uses renewable diesel fuel, minimizing the potential for ignition, but gasoline spills could be ignited, resulting in a wildland fire. Any fuel spills would be handled according to Midpen's spill-prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). Workers would not be permitted to smoke on Midpen lands except in certain designated areas (LU Regulations 404.2). Midpen implements strict practices for operation of equipment and ensures that staff and contractors are trained in fire prevention and suppression techniques in the event operation of equipment ignites a fire (MO Manual

Section 13.005; Safety Manual Chapter 1.7.0.0). All work crews would be required to maintain appropriate fire-suppression equipment (e.g., extinguishers) in vehicles at each work site to suppress inadvertently ignited fires. Activities that could cause sparks within Midpen lands are required to cease during extreme fire weather (RM Policy WF-1). Increased wildland-fire risks associated with workers and use of equipment and vehicles on Midpen lands would be reduced to less than significant through compliance with Midpen requirements.

Propane Flaming

Propane flaming would be used on small vegetation patches, generally along roads and trails, and would occur only during winter when vegetation is not dry. Propane flaming has the potential to start fires in areas with dry, dead plant materials. Midpen requirements include worker training in fire prevention and suppression, including requiring fire-suppression equipment at all work areas and stopping work in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). The impact would be less than significant.

Pile Burning

Pile burning is conducted as part of current vegetation management practices. Piles of vegetation would be created following manual and mechanical vegetation removal and allowed to dry prior to burning later. The stockpiling of dry, vegetative material has the potential to increase fire risks prior to burning because it is a concentrated source of flammable fuels. This risk is an existing risk associated with current practices; however, the number and location of stockpiles would increase with implementation of the Program. Ignition would be most likely to occur where piles are located near human use or influence, such as close to trails or roads. When burning the piles, current safety practices, such as having a fire-suppression crew on site during pile burns, would continue to be implemented as part of the Program. The intensity and location of piles to be burned could increase with implementation of the Program. If a pile or burn event were to ignite a wildland fire of any size or with potential for spread, the impact would be considered significant. A Smoke Management Plan would be prepared and implemented in accordance with BAAQMD's Regulation 5 and Title 17 of the CCR for any prescribed burn (including pile burns). The Smoke Management Plan would require identification of contingency actions to reduce exposure of sensitive receptors to smoke and specifications for monitoring and verifying meteorological conditions and smoke behavior. Pile burning on Midpen lands within Santa Cruz County would comply with the Santa Cruz County Fire Code that declares the open burn season for the county. The Program would coordinate with the Santa Cruz County Fire Chief to determine when pile burning would be allowed. Midpen would adhere to the restrictions and requirements of Rule 438 when conducting pile burning on lands within MBARD. Pile burning events would be registered with MBARD annually or seasonally and include a completed Smoke Management Plan and Smoke Management Permit Application Form consistent with the requirements of CCR, Title 17. Compliance with regulations would minimize the effect, but impacts could remain significant.

MM Hazards-2 would reduce impacts by prohibiting pile burning from occurring on days with wind speeds over 15 mph and when vegetation is damp. Pile burning would only be performed

under permits or with notification, as required, on allowable burn days. MM Hazards-2 also includes provisions for stockpiling that would reduce the likelihood of unintended ignition. Piles would also be constructed in areas of lowest risk for rapid fire spread in accordance with the measure (e.g., away from the edge of trails or roads or not at the base of slopes). The public within a one-mile radius of pile burns would be notified at least 24 hours prior to scheduled activities, and signs would be placed at trail heads and access roads notifying the public of where pile burning would occur. Impacts would be less than significant with mitigation.

Chemical Application

Herbicides are currently used in accordance with the IPMP. Implementation of the Program could increase use of herbicides across Midpen lands. Herbicides containing oils or petroleum solvents are the most flammable. Use of herbicides may marginally increase the risk of accidental fire. Improperly stored herbicides could combust or ignite if located near a heat source (Fishel, 2018). The increased risk of fire associated with herbicide storage, handling, and use could be a significant impact. Implementation of the IPMP BMPs would ensure that herbicides are stored and handled in accordance with the manufacturers' labels, which identify the flammability and associated precautions. With implementation of the IPMP BMPs, the impact on wildland fire risk from herbicide use would be less than significant.

Prescribed Herbivory

Prescribed herbivory would generally not involve equipment that could generate sparks in fire-prone areas. Electric fencing may be installed where natural barriers are not present. Electric fences have a very low chance of starting a fire (Quitmeyer, Bopp, Stephens, Karhu, & Anderson, 2004). Grazing animals would pose no fire-hazard risks. The impact would be less than significant.

Prescribed Burning

Prescribed burns would typically occur over the course of one half-day, with another one-half to two days for mop up and monitoring, which is undertaken to ensure that prescribed burns have been put out completely. The locations of prescribed burns would be selected considering the ability to manage the burn, but prescribed burns would still have the potential to become uncontrolled. Uncontrolled fires could place firefighters and residents, or other sensitive receptors outside of Midpen lands, at risk of injury or death. Structures within and adjacent to Midpen lands could be placed at risk as well. The impact from an escaped prescribed burn would be significant.

A Smoke Management Plan would be prepared and implemented in accordance with BAAQMD's Regulation 5 and Title 17 of the CCR for any prescribed burn. A Burn Plan would also be prepared for each prescribed burn. The plan would include the following: parameters for a fire-risk assessment based on several conditions of the area proposed for burn, including the topography, the vegetation, the weather, and the wind speed; contingency plans; and public notification. Burns are planned for and conducted under optimal weather conditions, including low wind, high moisture, and cool temperatures, which among other reasons, allows firefighters to ensure containment. The Burn Plan would also include provisions specifying

when burns could occur, as allowed by BAAQMD or MBARD, and the permits and notifications required. The Burn Plans prepared by Midpen would coordinate with CAL FIRE's 2018 Strategic Fire Plan to ensure the protection of lives, property, and natural resources from wildland fire as well as improve environmental resilience to wildland. Similar to pile burning, all prescribed burns on lands under the jurisdiction of Santa Cruz County would be required to comply with the Santa Cruz County Fire Code. Midpen would coordinate the timing of all prescribed burns with the Santa Cruz County Fire Chief to ensure the burns fall within the designated open-burn season for the county. Prescribed burns on lands under the jurisdiction of the Monterey Bay Air Resources District would adhere to the restrictions and requirements of Rule 438, as described above. Midpen Resource Management Policies require Midpen to work closely with CAL FIRE and other fire departments to implement prescribed burns, support the suppression of wildland fires, and prohibit activities that could spark fires during extreme fire hazard (RM Policies WF-1, WF-2). Adherence to the Burn Plan, Smoke Management Plan, and Midpen requirements would limit potential for escape of a prescribed fire, but may not be adequate to prevent harm to recreationalists or the public on trails and roads adjacent to prescribed burn areas. MM Hazards-3 would reduce impacts by requiring that all trails and internal Midpen-owned or managed roads within at least 500 feet of the outer edges of the prescribed burn area be closed to recreationalists and unaffiliated private vehicles (e.g., County or private landowner vehicles on Midpen managed but not owned land). Public roads must be closed within 500 feet of a burn, if possible; otherwise, a Traffic Control Plan will be developed to ensure the safety of drivers. MM Hazards-3 requires that the prescribed-burn specialist identify an appropriate buffer between prescribed burns and built structures that could be susceptible to damage. Impacts would be less than significant with implementation of mitigation.

Access and Vehicle Travel

Vehicle and equipment access would primarily occur on existing roads and trails, most of which are unpaved or gravel. Vehicle access may involve transport of livestock for pre-treatment of vegetation before use of other fire-management methods. No new access routes would be created, but foot trails or former overgrown trails may be cleared and used as skid trails to access areas off existing roads and trails. Adherence to Midpen's fire-prevention and treatment specifications, such as maintenance of fire-suppression equipment in vehicles (MO Manual Section 13.005) and cessation of work during extreme fire weather (RM Policy WF-1), would ensure that impacts from vehicle travel and equipment access are reduced to less than significant.

Analysis of Plans

Vegetation Management Plan

VMAs would be created and maintained by cutting and mowing vegetation and by removing small trees, brush, and ladder fuels. These activities would involve the use of mechanical equipment to mow, cut, and mulch vegetation. Slash not masticated or chipped could be stockpiled for pile burning, which may ignite and spread fire. Sparks from equipment and vehicles or escape of a pile burn could ignite a wildland fire, particularly in areas where risk of

spread is higher, such as the base of hills. The increased risk of a wildland fire associated with creation and maintenance of VMAs could be a significant impact. Compliance with resource-management policies and regulations would minimize wildland fire risk by requiring implementation of Midpen fuel-spill-prevention measures and IPMP BMPs, preparation of Smoke Management Plans, and avoidance of activities that could spark a fire during extreme fire weather. Midpen requirements include worker training in fire prevention and suppression, including requiring fire-suppression equipment at all work areas and stopping work in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). The effects associated with pile burning could remain significant. MM Hazards-2 requires implementation of several measures to reduce risk of wildland fire associated with pile burning. Mitigation would reduce the impact to less than significant.

Prescribed Fire Plan

Prescribed burns would be implemented, which, if escaped, could become wildland fires. While an escaped prescribed fire is a major concern, in practice, it rarely happens due to the numerous safety precautions undertaken. One study conducted by the Wildland Fire Lessons Learned Center found that out of 16,626 prescribed burns that treated approximately two-million acres of land throughout the United States, only 14 fires escaped, resulting in a 99.92 percent containment rate (Wildland Fire Lessons Learned Center, 2013). A separate study that focused on controlled burns conducted by prescribed burn associations reported a 99.2 percent prescribed-burn containment rate between 1995 and 2012 (Weir, Twidwell, & Wonkka, 2015). The equipment and vehicles used prior to, during, and after the burn could spark and ignite a wildland fire. Compliance with resource-management policies and regulations would minimize wildland fire risk by requiring implementation of Midpen fuel-spill prevention measures, preparation of a Burn Plan for prescribed burns to ensure that the prescribed burns follow all requirements and are timed appropriately to avoid escape that could turn into a wildland fire, and avoidance of activities that could spark a fire during extreme fire weather. Midpen requirements include worker training in fire prevention and suppression, including requiring fire-suppression equipment at all work areas and stopping work in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). Following these requirements would ensure that the Program's potential to cause wildland fires and thus expose people to injury or result in losses from wildland fires would be less than significant.

Significant impacts on recreationalists and vehicles on public roads during a prescribed burn, however, could occur if people not associated with managing the burn are too close to the burn (e.g., they could be exposed to injury or harm from smoke). MM Hazards-3 requires appropriate closures, signage, and buffers between trails and roads and the prescribed burn. The impact would be reduced to less than significant with mitigation.

Wildland Fire Pre-Plan

Installation or construction of firefighting infrastructure would involve use of vehicles and equipment that could spark a wildland fire. The impact could be significant. Compliance with

resource-management policies and regulations would minimize wildland-fire risk by requiring implementation of Midpen fuel-spill prevention measures and avoidance of activities that could spark a fire during extreme fire weather. Midpen requirements include worker training in fire prevention and suppression, including requiring fire-suppression equipment at all work areas and stopping work in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). The impact would be less than significant.

Impact Hazards-6: Exacerbation of wildland fire risks due to slope, prevailing winds, or other factors that could expose project occupants to pollutant concentrations from a wildland fire or the uncontrolled spread of a wildland fire.	**Significance Determination**
	Less than significant with mitigation

Implementation of the Program, overall, would reduce and not exacerbate wildland fire risks. The Program includes expansive measures to create and maintain fuelbreaks and reduce fuel loads across Midpen OSPs and other lands. These types of infrastructure and forest treatments reduce wildland fire risks and protect people and structures.

Some activities, including prescribed burning and use of vehicles and equipment, could increase the risk of wildland-fire ignition during implementation of the activity, which could be considered significant. Compliance with resource-management policies and regulations would minimize wildland fire risk by requiring implementation of Midpen fuel-spill prevention measures and IPMP BMPs, preparation of a Smoke Management Plan, and avoidance of activities that could spark a fire during extreme fire weather. Midpen requirements include worker training in fire prevention and suppression, including requiring fire suppression equipment at all work areas and stopping work in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). The effects associated with pile burning could remain significant. MM Hazards-2 requires implementation of several measures to reduce risk of wildland fire associated with pile burning. These measures would minimize risk associated with activities that could start a wildland fire. Ultimately, the Program would reduce the wildland-fire risk on Midpen lands as well as the size, intensity, and spread of wildland fires were one to break out. The impact on sensitive receptors within Midpen lands would be less than significant with mitigation due to the overall reduction in wildland-fire risk from implementation of the Program.

Impact Hazards-7: Installation or maintenance of roads, fuel breaks, emergency water sources, power lines, or other utilities that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.	**Significance Determination**
	Less than significant with mitigation

Several activities proposed under the Program would involve installation, construction, or maintenance of infrastructure, such as fuelbreaks, roads, and water tanks or pipelines. The VMAs and firefighting infrastructure proposed would minimize spread of wildland fires, if they occur, and aid in firefighting efforts. The infrastructure, once installed, would not

exacerbate fire risks and would, in fact, be beneficial. The potential environmental impacts of installing and constructing the proposed infrastructure are analyzed throughout this EIR under the VMP and Wildland Fire Pre-Plan. Mitigation measures are identified as applicable to minimize impacts to less than significant.

The specific infrastructure that may be installed and locations have not been identified to the same level of detail as the other proposed activities. Refer to Section 4.1.3: Scope of the Program EIR for information on the additional environmental review processes that may be required prior to construction and operation of any new firefighting infrastructure.

	Significance Determination
Impact Hazards-8: Exposure of people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.	**Less than significant with mitigation**

The potential for slope destabilization following a prescribed burn is analyzed under Impact Geology and Soils-2 in Section 4.6: Geology and Soils. Prescribed burns have the potential to change the soil profile, resulting in the top layer eroding in the short-term before new growth comes back, which could increase slope instability. MM Geology-2 requires installation of erosion-control measures to stabilize the soils and reduce potential for landslides, which would reduce impacts to less than significant levels. Fire lines, if created just for the purpose of the prescribed burn, would result in denuded areas that are more prone to landslides.
MM Geology-3 would reduce impacts by requiring use of existing facilities for fire lines where they occur, or else implementing other erosion-control measures. These measures would minimize erosion and decrease the potential for slope destabilization. Significant alteration to hydrologic conditions in some cases may decrease slope stability and result in landslides. Alteration to natural drainage courses and the potential for resultant flooding is discussed under Impact Hydrology-3 in Section 4.7: Hydrology and Water Quality. Prescribed burning would neither significantly alter drainage patterns nor result in flooding. Ultimately, implementation of the Program would minimize wildland-fire risk and associated slope destabilization that occurs post wildland fire. Impacts from landslides caused by prescribed burning would be minimized to less than significant with mitigation.

4.8.6 Mitigation Measures

MM Hazards-1: Avoidance of Contaminated Sites

To prevent exposure of workers to hazards or release of contamination into nearby waterways or clean soils, the following shall be conducted prior to any work within the boundary of any known contaminated sites or contaminated sites listed on government databases (e.g., the former Almaden AFS, Madonna Creek Ranch):

- Existing data and reports on the areas of contamination and remediation, or the SFBRWQCB, shall be consulted and a map prepared identifying any areas with residual contamination (e.g., lead paint, asbestos, petroleum) that are still present after remediation. This map shall be updated at least annually if any fire management activity is proposed in the area.
- The areas identified on the map as containing residual contamination shall be avoided either entirely (e.g., no cutting or entrance into site) or ground disturbing activities avoided (e.g., vegetation cutting allowed), depending upon a determination made by qualified personnel.

Applicable Location(s): Known contaminated sites (e.g., Former Almaden AFS within Sierra Azul OSP, Madonna Creek Ranch within Miramontes OSP).

Performance Standards and Timing:

- **Before Activity:** Review data and reports and prepare or update map of contaminated areas.
- **During Activity:** Consult map and avoid areas of residual contamination or avoid ground disturbing activities, depending on determination made by qualified personnel.
- **After Activity:** N/A

MM Hazards-2: Fire Risk Reduction for Stockpiling and Pile Burning

The following measures shall be implemented to reduce hazards associated with pile burning:

- Pile burning shall only be allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph).
- Piles shall not be constructed in areas where burning cannot be safely controlled, such as bottoms of steep, vegetated hills.
- Piles shall be set back from roads and trails at a distance specified by Midpen to minimize risk to recreationalists and other users.
- All requirements of the BAAQMD or MBARD shall be met, including any permit, notification, and reporting requirements.
- Public notification shall be provided at least 24 hours in advance of a burn to individuals within one mile and at trailheads and access roads leading to the area with piles proposed for burning. The public notification shall include current contact numbers to the appropriate burn coordinator.

Applicable Location(s): Wherever stockpiles of slash are made and piles burned.

Performance Standards and Timing:

- **Before Activity:** Notify public and obtain all permits and make all necessary notifications as required by BAAQMD and MBARD.
- **During Activity:** (1) Ensure that piles are located appropriately and (2) ensure proper weather conditions during pile burning.
- **After Activity:** N/A

MM Hazards-3: Safety Around Prescribed Burns

Trails and Midpen-Owned or Managed Roads

Midpen-owned or managed roads and trails shall be closed to public recreational and other unaffiliated private vehicle (e.g., County or private landowner vehicles on Midpen managed but not owned land) access within at least 500 feet of the outermost edges of a prescribed burn (or less with Burn Boss and Midpen concurrence). Midpen-owned or managed roads and trails shall be posted and blockaded with temporary fencing or the like. Notices of closures shall be posted at the trail heads or road entrances and on Midpen's website. Additional measures, such as staffing trail head closures, can be implemented as needed.

Public Roads

If possible, public roads within 500 feet of the outermost edges of a prescribed burn shall be closed in coordination with the appropriate agency (e.g., Caltrans). In the event this is not feasible due to volume of traffic or lack of alternative routes, a Traffic Control Plan shall be prepared and adopted in coordination with the appropriate agency. The Traffic Control Plan shall be designed to allow safe passage along roads adjacent to a prescribed burn and shall include the following at a minimum:

- Requirement to coordinate with local law enforcement (e.g., County Sheriff, California Highway Patrol).
- Installation of temporary signage at intervals ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress.
- Use of flaggers to slow traffic during the burn or stop traffic if wind conditions shift, resulting in smoke crossing the road.

Applicable Location(s): Within 500 feet of the outer edges of a prescribed burn.

Performance Standards and Timing:

- **Before Activity:** (1) Post notices of closures at trailheads and online and (2) prepare a Traffic Control Plan, if required.
- **During Activity:** (1) Place blockades along Midpen-owned or managed roads and trails, (2) staff closures of Midpen-owned or managed roads and trails, if needed, and (3) implement a Traffic Control Plan for public roads adjacent to prescribed burns, if needed.
- **After Activity:** Remove blockades and signage.

MM Geology-2: Erosion Control and Slope Stability Measures

See Section 4.6: Geology and Soils

MM Geology-3: Fire Lines During Prescribed Burns

See Section 4.6: Geology and Soils

MM Transportation-1: Emergency Responders and Access

See Section 4.12: Transportation

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4.9 Hydrology and Water Quality

4.9.1 Introduction

This section presents the environmental and regulatory setting for hydrology and water quality and evaluates the potential environmental impacts related to water quality from implementation of the Program.

No comments related to hydrology and water quality impacts were received during the public scoping period.

4.9.2 Existing Environment

Regional Setting

The San Francisco Bay Region is approximately 4,600 square miles in area and dominated by the San Francisco Bay Estuary, where fresh waters from California's Central Valley mix with saline waters of the Pacific Ocean. The San Francisco Bay Region encompasses all or major portions of San Mateo and Santa Clara, counties.

Climate and Precipitation

Midpen lands are in the Santa Cruz Mountains, within the San Francisco Peninsula. The peninsula separates the San Francisco Bay from the Pacific Ocean and extends from the Golden Gate south to the Santa Clara Valley and the northern end of Monterey Bay. Rainfall occurs mostly between November and April, with seasonal rainfall totals varying greatly depending upon topography, exposure, and elevation. The greatest rainfall occurs in the San Mateo coastal area along the west-facing slopes of the Santa Cruz Mountains and near the summits of the mountain range, where totals can reach up to 60 to 100 inches per year and average around 50 inches per year. In the San Mateo coastal area, fog can account for approximately 10 to 20 inches of the precipitation, much of which is delivered in the dry summer months (USDA, 1917; USDA, 1991; USDA, 2015).

Annual rainfall can be heavy in much of the area encompassing Midpen lands. A notable climactic feature of the Santa Cruz Mountains is the occurrence of storms of extreme intensity and duration that can result in periodic flooding in the lower-lying downstream portions of watersheds.

Groundwater

Hydrology

Midpen lands are located, for the most part, in or upgradient of the Santa Clara Valley groundwater basin (Groundwater Basin 2-009.02) and the Santa Clara Valley–San Mateo Plain (Groundwater Basin 2-009.03). The hydrologic areas (e.g., Purisima Creek Redwoods, El Corte de Madera Creek, La Honda Creek) within a few of the OSPs may contribute to coastal basins,

including the Half Moon Bay Terrace (Groundwater Basin 2-002) and the San Gregorio Valley (Groundwater Basin 2-024) (DWR, 2018).

Groundwater supplies approximately 50 percent of the potable water for the residents of Santa Clara Valley. The groundwater basin is bounded on the west by the Santa Cruz Mountains and the San Andreas Fault, on the east by the Diablo Range and Franciscan Basement, on the north by the San Francisco Bay, and on the south by the Santa Clara Valley groundwater divide. This groundwater divide at Cochrane Road in Morgan Hill separates the northerly flow of water toward San Francisco Bay from the southerly flow of water towards Monterey Bay (DWR, 2016). Natural recharge to groundwater flow in Santa Clara Valley occurs along the mountain fronts and flows toward the center of the basin and toward the southern San Francisco Bay; however, the predominant recharge mechanisms for the groundwater flow system are artificial recharge from the infiltration of imported water and leakage from transmission pipelines that transport the imported water as well as return flow from landscape irrigation. The predominant source of recharge in the San Francisco Peninsula is infiltration of precipitation and streamflow (DWR, 2016).

The Santa Clara Valley Water District (Valley Water) is the Groundwater Sustainability Agency (GSA) for the Santa Clara Subbasin in Santa Clara County and is sustainably managed through the comprehensive activities described in Valley Water's 2016 Groundwater Management Plan (Valley Water, 2016). Groundwater use in the Santa Clara Plain (the northern Santa Clara Subbasin) was 63,600 acre-feet (AF) in 2018, a nine percent decrease from 2017. This is below the long-term average of 92,000 AF due to continued lower demand and increased use of treated surface water by water retailers. Pumping locations and uses remained relatively stable, with nearly all (99 percent) groundwater used for municipal and industrial purposes. Groundwater levels remained fully recovered from the recent drought, with water levels in many wells at or above historical highs. In 2018, groundwater pumping in the southern Santa Clara Valley Basin was around 65,000 AF. Most pumping was for municipal and industrial uses (72 percent), with smaller amounts for agricultural (26 percent) and domestic (two percent) uses (Valley Water, 2018).

Groundwater Quality

Groundwater in northern Santa Clara Valley (most of the Santa Clara Subbasin) is generally of very good quality overall. In 2018, 99 percent of water supply wells tested met all health-based drinking-water standards. Public water systems must comply with drinking-water standards, which may require treatment or blending prior to delivery. Groundwater quality in the southern parts of the County is generally good, with most water-supply wells meeting drinking-water standards. However, nitrate continues to be a significant groundwater quality challenge; it was detected in 2018 above the drinking-water standard in 22 percent of water-supply wells tested in southern Santa Clara Valley (the southern-most portion of the Santa Clara Subbasin and the Llagas Subbasin) (Valley Water, 2018).

Surface Water Hydrology

Hydrologic Areas

The RWQCB for the San Francisco Bay Region (SFRWQCB) subdivides the region into seven hydrologic areas (SFRWQCB, 2017). Midpen lands occur within three hydrologic areas, identified in Table 4.9-1.

Table 4.9-1 Hydrologic Areas Within and Surrounding Midpen Lands

Hydrologic Area	Open Space Preserves	
San Mateo Coastal	• Long Ridge • Skyline Ridge • Russian Ridge • La Honda Creek	• El Corte De Madera Creek • Tunitas Creek • Purisima Creek Redwoods • Miramontes Ridge
San Mateo Bayside	• Pulgas Ridge	• Ravenswood
Santa Clara	• Teague Hill • Thornewood • Windy Hill • Coal Creek • Ravenswood • Foothills • Los Trancos • Monte Bello • Rancho San Antonio • Saratoga Gap • Picchetti Ranch	• Fremont Older • Stevens Creek Shoreline Nature Study Area • Pulgas Ridge • Purisima Creek Redwoods • El Sereno • Bear Creek Redwoods • St. Joseph's Hill • Foothills • Sierra Azul

Drainage and Water Bodies

The area that encompasses Midpen lands can be divided east and west into two hydrological regions by the Skyline-Loma Prieta Ridge, which roughly follows the San Andreas Fault Zone in the Santa Cruz Mountains. Watersheds in the San Mateo Coastal area to the west and southwest of the Skyline-Loma Prieta Ridge divide on the western slopes of the Santa Cruz Mountains drain westward into the Pacific Ocean. Watersheds in the South Bay area and Santa Clara area to the east of the Skyline-Loma Prieta Ridge on the eastern slopes of the Santa Cruz Mountains drain north to northeast into the San Francisco Bay.

Midpen lands are within seven major watersheds that extend from the Pacific Ocean in San Mateo County to the baylands of the San Francisco Bay in San Mateo and Santa Clara counties (Figure 4.9-1). Except for Ravenswood OSP and Stevens Creek Shoreline Nature Study Area, Midpen lands are in the headwaters or uppermost sections of these seven watersheds in terrain best characterized by steep ridges and deep canyons of the Santa Cruz Mountains. Surface-water features on and downstream of Midpen lands include year-round streams, ephemeral and perennial creeks, lakes, reservoirs, and ponds. Major water bodies in the vicinity and downstream of Midpen lands are listed in Table 4.9-2.

Flooding

Flooding on Midpen lands is generally not an issue due to the topography. Ravenswood and Stevens Creek Shoreline Nature Study Area OSPs, however, are in the San Francisco Bay Estuary in low-lying areas of the San Francisco Bay. According to the San Francisco Bay Plan, Ravenswood and the Stevens Creek Shoreline Nature Study Area OSPs are located within the existing 100-year floodplain and vulnerable to flooding from major storms and potential global climate change and sea-level rise (SFBCDC, 1996; SFBCDC, 2011).

Surface-Water Quality

Section 303(d) of the 1972 federal Clean Water Act (CWA) requires states to identify and submit to the USEPA a list of waterways and water bodies that do not meet water-quality objectives and are not supporting their beneficial uses. If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-source point controls via National Pollutant Discharge Elimination System (NPDES) permits or Waste Discharge Requirements, the CWA requires the establishment of Total Maximum Daily Loads (TMDL). The TMDL process provides a quantitative assessment of water-quality problems, contributing sources of pollution, and the contaminant-load reductions or control actions needed to restore and protect the beneficial uses of an individual waterbody or waterway impaired from loading of a contaminant. Impaired water bodies are water bodies that are not meeting water quality standards established by the CWA. Table 4.9-2 identifies the major creeks and streams in the watersheds that drain Midpen lands. CWA 2020(d)-listed impaired waterways and waterbodies in and downstream of Midpen lands are identified along with the impairment in Table 4.9-3. Table 4.9-4 identifies TMDLs that apply to waterbodies and waterways within Midpen lands.

Surface-water quality is not uniform throughout all streams. Some reaches of some streams, especially, though not exclusively, in the upper undeveloped headwaters of the watersheds, such as in or immediately downstream of Midpen lands, have retained sufficient value to sustain fisheries and riparian habitats.

Figure 4.9-1 Watersheds Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; USGS, 2015)

Table 4.9-2 Major Creeks and Streams in Watersheds Draining Midpen Lands

Watershed	Major Creek or Stream in Watershed	Midpen OSPs or Managed Lands Draining into the Watershed	Downstream Receiving Waterways and Waterbodies
Pescadero Creek	Pescadero Creek	• Long Ridge OSP	Pescadero Natural Preserve at Pescadero State Beach and Pacific Ocean
San Gregorio Creek-Frontal Pacific Ocean	San Gregorio Creek	• La Honda Creek OSP	San Gregorio State Beach and Pacific Ocean
San Gregorio Creek-Frontal Pacific Ocean	Tunitas Creek	• Tunitas Creek OSP	Tunitas Beach and Pacific Ocean
San Gregorio Creek-Frontal Pacific Ocean	Lobitos Creek	• Purisima Creek Redwoods OSP	Martin's Beach and Pacific Ocean
San Gregorio Creek-Frontal Pacific Ocean	Purisima Creek	• Purisima Creek Redwoods OSP	Whole Bone Beach and Pacific Ocean
San Gregorio Creek-Frontal Pacific Ocean	Pilarcitos Creek	• Miramontes Ridge OSP	Half Moon Bay State Beach and Pacific Ocean
San Mateo Creek-Frontal San Francisco Bay Estuaries	Cordilleras Creek	• Pulgas Ridge OSP	Steinberger Slough and San Francisco Bay Estuary
Saratoga Creek-Frontal San Francisco Bay Estuaries	San Francisquito Creek	• Tributaries connect to Teague Hill, Thornewood, and Windy Hill OSPs	Baylands Nature Preserve and San Francisco Bay Estuary
Saratoga Creek-Frontal San Francisco Bay Estuaries	Adobe Creek	• Foothills OSP • Los Trancos OSP • Monte Bello OSP	Mayfield Slough and San Francisco Bay Estuary
Saratoga Creek-Frontal San Francisco Bay Estuaries	Permanente Creek	• Rancho San Antonio OSP • Monte Bello OSP	Mountain View Slough and San Francisco Bay Estuary
Saratoga Creek-Frontal San Francisco Bay Estuaries San Francisco Bay	Stevens Creek	• Stevens Creek Shoreline Nature Study Area • Fremont Older OSP • Picchetti Ranch OSP • Monte Bello OSP	Steven's Creek Reservoir, Whisman Slough and San Francisco Bay Estuary
Saratoga Creek-Frontal San Francisco Bay Estuaries	Saratoga Creek	• Saratoga Gap OSP	Thomas Aquino Creek and then Guadalupe Slough and San Francisco Bay Estuary
Saratoga Creek-Frontal San Francisco Bay Estuaries	San Tomas Aquino Creek	• El Sereno OSP	Mayfield Slough and San Francisco Bay Estuary

Watershed	Major Creek or Stream in Watershed	Midpen OSPs or Managed Lands Draining into the Watershed	Downstream Receiving Waterways and Waterbodies
Guadalupe River-Frontal San Francisco Bay Estuaries	Los Gatos Creek	• Sierra Azul OSP • St. Joseph's Hill OSP	Lexington Reservoir, Guadalupe River and then Alviso Slough and San Francisco Bay Estuary
Guadalupe River-Frontal San Francisco Bay Estuaries	Guadalupe River	• Sierra Azul OSP	Alviso Slough and San Francisco Bay Estuary

Source: (Google Earth, 2020; Midpen, 2020; DWR, 2018)

Table 4.9-3 303(d) List of Impaired Waterbodies and Waterways in Midpen's Boundary

Waterbody or Waterway (Category)	Type of Impairment or Pollutant	Estimated Completion of TMDL
Pescadero Creek (5)	Sedimentation/ Siltation[b]	2016
Permanente Creek (5)	Diazinon[b]	2007
	Selenium[b]	2021
	Toxicity[b]	2021
	Trash[a]	N/A
Stevens Creek (5)	Diazinon[b]	2007
	Temperature, Water[b]	2021
	Toxicity[b]	2019
	Trash[a]	N/A
Saratoga Creek (4A)[c]	Diazinon[b]	2007
	Trash[a]	N/A
San Tomas Aquinas Creek (4B)	Trash[b]	2029
Calabazas Creek (4A)	Diazinon[b]	2007
Calabazas Creek (1)	Aquatic Life Support[b]	N/A
Guadalupe Creek (4A)	Mercury[b]	2010
San Gregorio Creek (5)	Indicator Bacteria[b]	2019
	Sedimentation/ Siltation[a]	2013
San Francisquito Creek (5)	Diazinon[b]	2007
	Sedimentation/ Siltation[a]	2013
	Trash[a]	N/A
Adobe Creek (2)	Secondary Contact, Trash[b]	N/A

Waterbody or Waterway (Category)	Type of Impairment or Pollutant	Estimated Completion of TMDL
	Aquatic Life Support, Trash[a]	N/A
Stevens Creek Reservoir (5)	Chlordane[b]	2019
	Dieldrin[b]	2019
	Mercury[b]	2013
	PCBs[a]	2019
Guadalupe Slough (5)	Toxicity[b]	2029
Lexington Reservoir (5)	Mercury[b]	2029
Los Gatos Creek (4A)	Temperature, water	2031
Almaden Lake (4A)	Mercury[b]	2010
Almaden Reservoir (4A)	Mercury[b]	2010
Guadalupe Reservoir (4A)	Mercury[b]	2010
Guadalupe River (4A)	Diazinon[b]	2007
	Mercury[b]	2010
	Trash[a]	N/A
San Francisco Bay, Lower (5)	Chlordane[a]	2013
	DDT[a]	2013
	Dieldrin[a]	2013
	Dioxin compounds[a]	2019
	Furon compounds[a]	2019
	Invasive species[a]	2019
	Mercury[b]	2008
	PCBs[b]	2008
	PCBs, dioxin-like[b]	2008
	Trash[a]	2021
San Francisco Bay, South (5)	Chlordane[a]	2013
	DDT[a]	2013
	Dieldrin[a]	2013
	Dioxin compounds[a]	2019
	Furon compounds[a]	2019

Waterbody or Waterway (Category)	Type of Impairment or Pollutant	Estimated Completion of TMDL
	Invasive species[a]	2019
	Mercury[b]	2008
	PCBs[b]	2010
	PCBs, dioxin-like[b]	2010
	Selenium[b]	2021
Pacific Ocean at Pescadero Beach (1)	Swimming, indicator bacteria[b]	N/A
Pacific Ocean at San Gregorio Beach (1)	Swimming, indicator bacteria[b]	N/A

Notes:

Category 5 criteria: 1) A water segment (i.e., waterbody or waterway) where standards are not met and a TMDL is required, but not yet completed, for at least one of the contaminants being listed for this segment.

Category 4A criteria: 1) A water segment where ALL its 303(d) listings are being addressed and 2) at least one of those listings is being addressed by a USEPA-approved TMDL.

Category 4B criteria: 1) A water segment where ALL its 303(d) listings are being addressed by action(s) other than TMDL.

Category 2 criteria: A water segment with water-quality information that is insufficient to determine an appropriate decision recommendation, for reasons such as: monitoring data have poor quality assurance, not enough samples in a dataset, no existing numerical objective or evaluation guideline, the information alone cannot support an assessment, etc.

Category 1 criteria: 1) A water segment that fully supports at least one of its California beneficial uses; 2) a water segment has other uses that are not assessed or lack sufficient information to be assessed; and 3) no assessed uses are not supported.

[a] TMDL still required.

[b] Being addressed by USEPA approved TMDL.

[c] Within Midpen lands and downstream from Midpen lands.

Source: (SWRCB, 2018a; SWRCB, 2018b)

Table 4.9-4 TMDLs for Waterbodies and Waterways that Drain through Midpen Lands

Contaminant	Source	TMDL	Waterbodies or Waterways
Diazinon	Urban runoff/storm sewers	100 ng/l[a]	• Calabazas Creek • Permanente Creek • Saratoga Creek • Stevens Creek
Mercury	• Mining waste • Naturally occurring • Urban/nonurban runoff	0.2 mg mercury per kg suspended sediment (dry wt., annual median)	• Guadalupe Creek
Sediment	• Roads • Human-caused channel incision	Residual pool volume[b]: • Mean value ≤ 0.21	• Pescadero Creek

Contaminant	Source	TMDL	Waterbodies or Waterways
	• Legacy effects of intensive historical livestock grazing and timber harvesting	• Maximum value ≤ 0.45 Substrate composition: • ≤ 14% fines < 0.85 mm • ≤ 30% fines < 6.40 mm Large woody debris loading in redwood channels: • ≥ 300 m^3/ha of bankfull channel area Large woody debris loading in hardwood channels: • ≥ 100 m^3/ha of bankfull channel area	

Notes:

ng/l – nanogram/liter
kg – kilogram
mg – milligram
mm – millimeter
m^3/ha – cubic meters per hectare

[a] One-hour average

[b] A unitless measure of the fraction of a pool's volume that is filled by fine sediment

Source: (SFRWQCB, 2017; SWRCB, 2018a)

4.9.3 Regulatory Setting

Federal

U.S. Environmental Protection Agency – Clean Water Act

Overview

The CWA of 1972 and subsequent amendments, under the enforcement authority of the USEPA, were enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA gave the USEPA the authority to implement pollution-control programs such as setting wastewater standards for industry. It also set water-quality standards for surface waters and established the NPDES program to protect water quality. Midpen lands feature various surface waters that are subject to CWA requirements.

Clean Water Act Section 404

Section 404 of the CWA authorizes USACE to regulate the discharge of dredged or fill material to waters of the U.S. and adjacent wetlands. USACE issues individual site-specific or general (Nationwide) permits for such discharges. Implementation of certain activities under the Program may require a permit under Section 404 of the CWA.

Clean Water Act Section 401
Under Section 401 of the CWA, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain a Water Quality Certification from the appropriate state agency and ensure the proposed activity will uphold state and federal water quality standards. In California, the permitting regulatory agency is the State Water Resources Control Board (SWRCB). Implementation of certain activities under the Program, if a 404 permit is needed, may require a Section 401 Water Quality Certification from the RWQCB.

Clean Water Act Section 402
Under Section 402 of the CWA, discharge of contaminants to navigable waters is prohibited unless the discharge is in compliance with a NPDES permit. Implementation and enforcement of the NPDES program is conducted through the SWRCB and the nine RWQCBs. The local RWQCB (SFRWQCB) has set standard conditions for each permittee in the San Francisco Bay Area, which includes effluent limitation and monitoring programs. Midpen would need to obtain a NPDES permit if any discharge of contaminants to navigable waters is proposed in the Program.

Clean Water Act Section 303
Section 303 of the CWA requires states to adopt water-quality standards for all surface waters of the United States. As defined by the act, water-quality standards consist of designated beneficial uses of the water body in question and criteria that protect the designated uses. Section 304(a) requires the USEPA to publish advisory water quality criteria that accurately reflect the latest scientific knowledge on the kind and extent of all effects on health and welfare that may be expected from the presence of pollutants in water. The SWRCB and its RWQCBs have designated authority in California to identify beneficial uses and adopt applicable water-quality objectives.

Section 303(d) requires states to identify waterways and waterbodies that do not meet water-quality objectives and are not supporting their beneficial uses. Each state must submit a list of waters that are not meeting water-quality objectives or may soon become impaired (303[d] list) to the USEPA every 2 years. Section 303(d) also requires the states to develop a TMDL for each of the listed pollutants. The TMDL is the amount of the pollutant that the waterbody can receive and still be in compliance with water-quality objectives. Refer to Table 4.9-4 for TMDLs applicable to waterways within Midpen lands.

State

Department of Water Resources – Sustainable Groundwater Management Act
In September 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of AB 1739, SB 1168, and SB 1319, collectively known as the Sustainable Groundwater Management Act (SGMA). SGMA provides a framework for sustainable groundwater management and requires governments and water agencies of high- and medium-priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. A small portion of Midpen lands is located within the Santa Clara Valley groundwater basin subject to SGMA.

State Water Resources Control Board – Construction General Permit
The Construction General Permit (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ; NPDES No. CAS000002), regulates all storm-water discharges associated with construction activities where clearing, grading, and excavation results in soil disturbance of one acre or greater. Construction activity that results in soil disturbances of less than one acre is subject to the Construction General Permit if there is potential for significant water-quality impairment resulting from the activity as determined by the RWQCB. For all projects subject to the Construction General Permit, applicants are required to develop and implement an effective Storm Water Pollution and Prevention Plan (SWPPP), to implement sediment, erosion, and pollution-prevention control measures and to obtain coverage under the Construction General Permit. A SWPPP would be required where Program activities, such as construction of firefighting infrastructure, results in soil disturbance of 1 acre or greater.

State Water Resources Control Board – Porter-Cologne Water Quality Control Act
The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for the protection of the quality of all waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a statewide program for the control of water quality, recognizing that waters of the State are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water-quality control is therefore administered on a local level with statewide oversight. Within the program framework, the act authorizes the SWRCB and RWQCBs to oversee the coordination and control of water quality within California. SFRWQCB is responsible for defining beneficial uses of surface waters and groundwater and identifying impaired waterways and waterbodies (identified on the 303[d] list) within Midpen lands.

Midpen had, until June 30, 2018, a Waste Discharge Requirement/Routine Maintenance Agreement under the California Porter-Cologne Water Quality Control Act. RWQCB staff requested Midpen obtain a regional general permit from the Army Corps to ensure impacts to State and federal waters under Porter-Cologne and Clean Water Act are covered by a future programmatic agreement. Midpen has been applying for individual permits since the agreement expired and is working on a renewed agreement. Any impacts from Program activities to waters of the State that are not covered by a federal permit would require a Waste Discharge Requirement/Routine Maintenance Agreement.

California Department of Fish and Game – Streambed Alteration Agreement Program
Under §§ 1600-1616 of the State Fish and Game Code, notification to the CDFW is required for any activity that diverts or obstructs the natural flow or changes the bed, channel, or bank of any river, stream, or lake or proposing to use any material from a streambed. Typically, CDFW takes jurisdiction over any small creek or drainageway with a defined bed and banks. The notification requirement generally applies to any work undertaken within the annual high-water mark of a wash, stream, or lake that contains or once contained fish and wildlife or that supports riparian vegetation. Implementation of the Program may require a Section 1602

Lake and Streambed Alteration Agreement with CDFW. Midpen currently holds a Routine Maintenance Agreement under the California Fish and Game Code Section 1602, Lake or Streambed Alteration Agreement, which is valid through 2024 but is also revisiting this permit to clearly address activities under the IPMP and WFRP.

Local

San Francisco Regional Water Quality Control Board – Water Quality Control Plan
The San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) was prepared in accordance with the Porter-Cologne Water Quality Control Act. The Basin Plan identifies beneficial water uses that the SFRWQCB protects, water-quality objectives to protect the designated beneficial water uses, and strategies and time schedules to achieve the water-quality objectives. The Basin Plan identifies 19 beneficial uses that apply to key waterbodies. Water-quality objectives for surface waters encompass features such as bacteria levels, sediment, pH, and temperature. TMDLs or Water Quality Improvement Plans are required by the CWA for waterbodies where water-quality standards are not currently met (SFRWQCB, 2017). All activities proposed in the Program must comply with the Basin Plan.

Santa Clara Valley Water District – 2016 Groundwater Management Plan
The 2016 Groundwater Management Plan describes Valley Water's comprehensive groundwater-management framework, including existing and potential actions to achieve basin-sustainability goals and ensure continued sustainable groundwater management. The 2016 Groundwater Management Plan covers the Santa Clara and Llagas subbasins, located entirely in Santa Clara County and identified by the California Department of Water Resources (DWR) as Basins 2-009.02 and 3-003.01, respectively. Small areas within Midpen lands are located in the Santa Clara Valley groundwater basins, and larger areas likely contribute water that eventually ends up in this groundwater basin.

Midpeninsula Regional Open Space District – Resource Management Policies
Midpen's resource-management policies include regulations for the management of natural, cultural, and agricultural resources. These policies are used by Midpen to manage its various lands and open spaces, all of which fall under this Program. Midpen recognizes the protection of hydrology and water quality as one of the primary benefits of open space (Midpen, 2014a). The following goal and policies relate to hydrology and water quality:

Goal WR Protect and restore natural water courses, wetlands, and hydrologic processes.

Policy WR-1 Protect surface and groundwater from contamination.

Policy WR-2 Restore, maintain, or enhance water quality on District lands.

Policy WR-3 Restore hydrologic processes.

Policy WR-6 Preserve and enhance fisheries habitats.

Policy WR-7 Preserve and enhance ponds and other wetland habitats.

Midpeninsula Regional Open Space District – Vision Plan

Midpen adopted the Vision Plan in 2014 to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014b). Midpen uses the Vision Plan to guide management decisions related to the lands and open spaces that would be a part of this Program. The following themes and goals pertain to the hydrology and water quality within Midpen lands:

Stewardship:

- Protect watersheds and restore stream flow to improve habitat for fish and wildlife.

Model Ecologically Sound Practices:

- Promote wise water use and other ecologically sensitive farming practices.

San Mateo County – General Plan

Midpen lands within this Program in San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals and objectives regarding Vegetative, Water, Fish, and Wildlife Resources and Water-Supply Policies in the San Mateo County General Plan are applicable to hydrology and water quality (San Mateo County, 2013):

1.1 **Conserve, Enhance, Protect, Maintain, and Manage Vegetative, Water, Fish and Wildlife Resources.** Promote the conservation, enhancement, protection, maintenance, and managed use of the County's vegetative, water, fish, and wildlife resources.

1.3 **Protection and Productive Use of Economically Valuable Vegetative, Water, Fish, and Wildlife Resources.** Protect the availability and encourage the productive use of the county's economically valuable vegetative, water, fish, and wildlife resources in a manner that minimizes adverse environmental impacts.

1.26 **Protect Water Resources**. Ensure that development will (1) minimize the alteration of natural water bodies, (2) maintain adequate stream flows and water quality for vegetative, fish, and wildlife habitats; (3) maintain and improve, if possible, the quality of groundwater basins and recharge areas; and (4) prevent to the greatest extent possible the depletion of groundwater resources.

10.1 **Coordinate Planning.** Coordinate water-supply planning with land use and wastewater management planning to assure that the supply and quality of water is commensurate with the level of planned developments.

10.2 **Safeguarding Water Supplies.** Seek to safeguard the productive capacity of groundwater aquifers and storage reservoirs.

10.3 **Water Conservation**. Promote the conservation and efficient use of water supplies.

10.4 **Development of Water Supplies.** Promote the development of water supplies to serve agricultural uses as the highest priority, domestic uses, and recreational uses.

Santa Clara County – General Plan

Midpen lands within this Program in Santa Clara County are subject to the stipulations outlined in the San Mateo County General Plan. The Resource Conservation Chapter of the Santa Clara General Plan includes policies covering hydrology and water quality (Santa Clara County, 1994; Santa Clara County, 2015). The strategies and policies that may apply to the Program are listed below:

C-RC 18 Water quality countywide should be maintained and improved where necessary to ensure the safety of water supply resources for the population and the preservation of important water environments and habitat areas.

C-RC 20 Adequate safeguards for water resources and habitats should be developed and enforced to avoid or minimize water pollution of various kinds, including:

a. erosion and sedimentation;
b. organic matter and wastes;
c. pesticides and herbicides;
d. effluent from inadequately functioning septic systems;
e. effluent from municipal wastewater treatment plants;
f. chemicals used in industrial and commercial activities and processes;
g. industrial wastewater discharges;
h. hazardous wastes; and
i. non-point source pollution.

4.9.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on hydrology and water quality would be considered significant if they exceeded the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;

- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Program may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
  - result in substantial erosion or siltation on- or off-site;
  - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
  - create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
  - impede or redirect flood flows;
- Risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

(See CEQA Guidelines, Appendix G, I.)

Analysis Methodology

This section of the Program EIR includes an analysis of hydrology and water-quality impacts from implementation of the Program. The analysis presented in this section was performed using qualitative and comparative methods that involved identifying the areas where Program activities could occur near waterbodies or waterways and assessing the resultant potential for effects, primarily from sedimentation as a result of erosion of bare or exposed soils as well as from contaminant runoff. Stormwater runoff rates and volumes could change due to the vegetation management activities included in the Program that alter forest densities and cover. These changes are qualitatively assessed with regard to their potential to cause hydrology and water-quality impacts.

4.9.5 Impact Analysis

Impact Hydrology-1: Violate water-quality standards or waste-discharge requirements or otherwise substantially degrade surface or groundwater quality or substantially alter the existing drainage pattern of the area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion or siltation on or off site.	**Significance Determination**
	Less than significant with mitigation

Overview

Midpen lands span across several counties and are subject to compliance with various local regulations and ordinances. The Santa Clara County and San Mateo County General Plans provide local guidelines for managing hydrology and protecting water quality, which Midpen follows when managing its lands within these jurisdictions. Midpen also has specific land

management policies outlined in the Vision Plan and Resource Management Policies. The Program would comply with these policies when managing its water resources.

Vegetation-management actions would result in minor modifications to the hydrologic conditions in the Program area. Water-quality impacts from sedimentation and siltation of waterbodies or waterways would accrue primarily from the actions associated with vegetation treatments and non-native shrub and understory removal. Numerous major streams are found throughout the Program area (refer to Table 4.9-2). Several waterways and waterbodies that currently do not meet water-quality objectives under Section 303(d) are located within and surrounding Midpen lands (listed in Table 4.9-3). Intentional physical alteration of streams and stream banks is not proposed in the Program, but alteration could occur for access, from landslides or debris flows that result from work, or from sedimentation if erosion occurs. Vegetation trimming, thinning, or removal in riparian corridors (such as for weed treatment) would be limited. Alterations to either intermittent or perennial streams or to wetlands would generally be avoided, but if avoidance is not possible, work may first require a Section 1602 Lake and Streambed Alteration Agreement with CDFW and potentially a permit under Section 404 of the CWA and Section 401 Water Quality Certification from the SFRWQCB.

Sedimentation can increase downstream turbidity, which is considered a water-quality impact. Sediment-laden runoff can carry heavy metals such as mercury, arsenic, and copper. The majority of anthropogenic mercury present in sediments are from tailings of former mercury mines last operated in the 1960s in Santa Clara County in the western portion of the Santa Clara Hydrologic Area. To the extent that sediment delivery to the streams and reservoirs is reduced, the input of heavy metals to streams and reservoirs would also be reduced. Sediments also carry with them nutrients such as phosphorus and nitrogen and biological pathogens such as coliform, cryptosporidium, and giardia. Sediment transport to and deposition in streams and reservoirs can result in water turbidity and provide an environment favorable for aquatic weeds and algae. Certain species of algae secrete organic chemicals, such as geosmin and methylisoborneol. Algae, in concert with sediment, decreases water clarity, an indicator of the general health of a waterbody. Suspended sediment itself, measured as turbidity, also falls within a regulated water-quality parameter.

In addition to sediment-related impacts, the presence of maintenance workers and vehicles can also contribute to water-quality degradation by introducing other types of contaminants such as solid and liquid wastes (e.g., litter, oily residue from vehicles, or accidental spill of fuels).

Impacts on water quality from each of the tools and techniques proposed in the Program are described here, followed by the composite impacts of each of the proposed vegetation management actions by plan on water quality.

Analysis of Vegetation Management Tools and Techniques

Manual and Mechanical Techniques

Implementation of the Program would involve using manual and mechanical tools and techniques such as hand tools, heavy equipment, pile burning, and propane flaming. Manual

and mechanical vegetation management tools and techniques would include some degree of land alteration, which could locally increase stormwater runoff rates during and after work. Increased stormwater runoff could result in localized erosion and subsequent siltation or sedimentation of downstream areas and the transport of contaminants in the sediment. Manual and mechanical removal of vegetation could disrupt and loosen soil through root removal or root death, increasing destabilization and subsequent siltation or sedimentation risks, particularly on slopes.

If eroded sediments carry natural metals, nutrients, or pathogens, downstream water quality could also be impacted. Generally, soil-disturbing work resulting in groundcover of less than 70 percent and 100 feet or less upslope of a waterway or riparian corridor could have some potential to cause more substantial sedimentation of the waterway or habitat (Sweeney, 2014; Lang & McDonald, 2005). Most manual and mechanical removal work would not result in circumstances that would result in significant erosion. The likelihood of erosion and subsequent sedimentation impacts would be higher where ground disturbing mechanized equipment or vegetation clearance is proposed. Creekbank or riparian corridor erosion could increase sediment yields to these waterways, significantly degrading water quality. Midpen's IPMP BMP 28 requires implementation of erosion-control measures on sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment. Implementation of IPMP BMP 28 would minimize the impacts from potential erosion or sedimentation during or after Program activities are completed. Impacts would be potentially significant if sedimentation of waterways occurred from management activities reducing groundcover to less than 70 percent or installing cleared areas (e.g., spur roads) on steep slopes. MM Geology-2 includes several measures that, where implemented, minimizes the potential for erosion and therefore the amount of mobilized sediment running off from work areas into waterways. Measures include limiting disturbed areas, implementation of design and control measures for installation of cleared areas on slopes greater than 35 percent, shutting down heavy equipment when soils become saturated, sowing native grasses and herbs in denuded areas where natural colonization is not happening rapidly, using slash or chip to cover and protect exposed soils, and prohibiting substantial ground-disturbing work (e.g., use of heavy equipment and pulling large vegetation) during rain events and 48 hours after a rain event. Implementation of these erosion control measures would ensure that work within 100 feet and upslope of a waterway or waterbody do not contribute substantial quantities of sedimentations. Impacts from manual and mechanical methods of vegetation management on water quality would be less than significant.

Chemical Application

Limited chemical control (herbicide) would be used under the Program. Broadcast spraying is not allowed. Herbicide runoff has the potential to contaminate surface water and groundwater and cause a significant impact. Guidelines for safely handling and applying pesticides and other BMPs in the IPMP Guidance Manual would be implemented during chemical treatment. All herbicide application would occur under the direction of personnel holding a California

Department of Pesticide Regulation license or certificate, in accordance with IPMP BMP 4. Other IPMP BMPs that would be implemented include BMP 5, which requires that storage, loading, mixing, and handling of herbicides take place at least 300 feet from any aquatic feature and BMP 9, which describes required procedures for cleanup of containers, including proper disposal of rinsate and used pesticide containers. Compliance with the IPMP BMPs would prevent improper or over-application of chemicals and improper disposal of rinsate and pesticide containers and prevent discharge or runoff of chemicals into aquatic features. Therefore, chemical treatments in fuel-management areas would not result in a violation of water-quality standards or waste-discharge requirements. Potential water-quality impacts from herbicide use during Program implementation would be less than significant.

Prescribed Herbivory

Prescribed herbivory has the potential to create livestock trails and bare soil. Unmanaged trails and bare soil as a result of prescribed herbivory could result in gullies and erosional features, changing the existing drainage patterns of the site. Sedimentation and siltation of downstream waterbodies or waterways from altered drainage patterns would be potentially significant if prescribed herbivory reduces groundcover to less than 70 percent. Livestock also generates fecal waste while grazing, which could be transported into waterbodies or waterways during a storm event. Fecal waste could contribute coliform bacteria and nitrates to surface waters affecting water quality. The impact on water quality associated with grazing would be potentially significant. MM Geology-1 requires prescribed herbivory to avoid the rainy season, minimizing congregation of livestock in any one location, minimizing creation of livestock trails, limiting numbers of livestock in a particular area—determined via the stocking-rate equation—and remediation if bare soil occurs. Mitigation also limits or prohibits prescribed herbivory within 100 feet of a waterbody or waterway (including riparian corridors), depending upon a qualified professional's assessment. The impact would be less than significant with mitigation.

Prescribed Burning

Prescribed burning involves land alteration and could result in localized erosion and subsequent siltation or sedimentation of downstream areas. Water-quality impacts from prescribed burns are related to many factors, including location of the burn in proximity to riparian areas, fire severity, burn patchiness, percent of slope, size of burn compared to catchment, and rainfall following the burn. Prescribed burns generally result in burning of surface fuels while leaving the canopy intact. Heating of soils can result in the creation of a hydrophobic soil layer that results in a decrease in stormwater infiltration and an increase in runoff rates that can mobilize silts. On a large scale, runoff may not be significantly affected due to wettable patches, root holes, and other sources of infiltration. Studies of sediment yields following prescribed burns have found prescribed burns and low-severity fires to minimally increase fine sediment volumes in creeks within a burn area. Low-severity fires have been found to have a minimal impact on stream-water chemistry (J. G. Cawson, 2012; Bêche, Stephens, & Resh, 2005) as long as they are carefully planned with consideration for downstream slopes. Some potential for more substantial water-quality impacts could occur for prescribed fires in close proximity to waterways resulting in a potentially significant impact.

IPMP BMP 28 requires erosion-control measures for activities implemented near aquatic features but does not address potential risks associated with prescribed burns near waterways. MM Geology-2 would reduce impacts by requiring that prescribed burns be performed outside of perennial and intermittent streams, riparian forest, and woodlands, and that a 50-foot buffer be maintained around perennial and intermittent streams when the broadcast burn is proposed upslope and on steep slopes. MM Geology-3 requires that prescribed burn boundaries avoid gullies and erodible soils as well as the use of existing facilities for fire lines where they occur, further reducing erosion into waterways and waterbodies caused by prescribed burning. Erosion and consequent sediment runoff into waterways and waterbodies would be minimized, and impacts from prescribed burning on water quality would be less than significant with implementation of these measures.

Access and Vehicle Travel

Vehicle and equipment access would primarily occur on existing roads and trails, most of which are unpaved or gravel. Vehicles and equipment can access most types of VMAs entirely on existing roads and trails with existing waterway crossings (i.e., bridges or culverts). On very rare occasions, particularly for the creation or maintenance of FRAs that are more expansive in size and generally interior in the preserves, vehicles may need to access project sites across streams or other waterways. Crossing a waterbody has the potential to disrupt the bed and/or bank and riparian corridor and can contribute to sedimentation that could affect water quality. As previously described, sediments transport contaminants, which impacts water quality. Vehicle access could cause rutting or deposition of soil from banks into the bed of streams even if the stream is crossed while dry. Additional water-quality impacts from vehicle access could occur if a spill of fuels or lubricants were to occur in or near waterbodies or waterways. Vehicle travel to and from work areas within Midpen lands could result in a minimal risk of accidental spills of fuels or lubricants from these vehicles. Impacts would be potentially significant. Leaks and spills would be addressed by implementing Midpen's spill-prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). MM Hydrology-1 includes measures that pertain to stream or other waterway crossings, on the very rare occasion, should they be needed. Implementation of MM Hydrology-1 requires that instream crossings, in the rare event they are needed for FRA work, are only allowed during periods of no flow and no saturation and if the stream can be crossed without alteration to the bed or bank (such as through the use of temporary mats). If the waterway[1] cannot be crossed when dry and without alteration to the bed or bank, either plates or similar structures would be used to span from bank to bank, or the instream crossing would only be performed after and in accordance with the appropriate 1602 Streambed Alteration Agreement from CDFW and Section 404 and 401 CWA permits. If a stream could be impacted through soil deposition, rutting, or loss of vegetation, MM Hydrology-1 requires that streambed and banks be restored immediately after

work is completed and access is no longer needed and that exposed banks or disturbed vegetation is replanted with native riparian vegetation, as appropriate. The impacts from siltation and sedimentation would be less than significant after implementation of mitigation.

Analysis of Plans

Vegetation Management Plan

VMAs would be created and maintained by cutting and mowing vegetation and by removing small trees, brush, and ladder fuels. The creation of new VMAs and maintenance of existing fuel-reduction areas, ingress/egress routes, fuelbreaks, and disclines would result in surface disturbance, potential erosion, and loss of topsoil, leading to sedimentation or siltation of nearby waterways and waterbodies. Midpen's IPMP BMP 28 requires implementation of erosion control measures on sites with loose or unstable soils or steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment. Implementation of IPMP BMP 28 would minimize the impacts from potential erosion or sedimentation associated with implementation of the VMP. MM Geology-2 and MM Geology-3 require implementation of additional erosion-control measures to avoid or minimize erosion associated with sedimentation of waterways or waterbodies specifically where groundcover would be reduced to less than 70 percent and on steep slopes. Heavy equipment could be transported to work areas to create or maintain VMAs. Waterbodies crossing for most VMA creation or maintenance would not be needed but could be needed on a rare occasion when working on FRAs, deeper within and crossing waterbodies could result in disruption of riparian corridors and contribute to sedimentation. Implementation of MM Hydrology-1 would reduce potential impacts that pertain to stream or other waterway crossings.

Prescribed Fire Plan

Implementation of prescribed burns could result in water-quality impacts from increased erosion. Pre-treatment activities to create or maintain control lines and prescribed burns would involve use of vehicles, heavy equipment, and pile burning. Pile burning would impact localized areas 5 to 10 feet in diameter and 4 to 8 feet in height and would not impact a large enough area as to change stormwater runoff patterns that could result in sedimentation or siltation. The equipment and vehicles used prior to, during, and after the burn could result in sedimentation or siltation of waterways or contamination through vehicle fuels and lubricants. Implementation of Midpen's spill prevention BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6) would reduce the impact of accidental spills of fuels or lubricants from equipment and vehicles. MM Geology-2 and MM Geology-3 require implementation of erosion control measures, which would minimize sedimentation and water quality impacts. Potential sediment runoff into waterways and waterbodies as a result of prescribed burning would be minimized to less than significant with implementation of mitigation.

Wildland Fire Pre-Plan

Installation or construction of roads, staging and landing areas, and other firefighting infrastructure would involve use of vehicles and equipment, which could result in accidental spills of fuels or lubricants into waterways. Implementation of Midpen's fueling, spill-prevention, and hazardous materials storage and handling BMPs (MO Manual Sections 14.005, 14.006, and 13.010; Safety Manual Sections 1.6.5, 1.6.6, 1.11.1, and 1.11.2) would reduce the impact of accidental spills of fuels or lubricants from equipment, vehicles, and work areas. Creation of new roads and trails near riparian areas increases the potential for disruption of riparian corridors and additional sedimentation into waterbodies and waterways. Midpen implements erosion-control measures to minimize potential impacts of erosion and sedimentation into aquatic features (IPMP BMP 28). If disturbed areas would exceed 1 acre, a NPDES General Permit for construction activities would be required. The NPDES Construction General Permit (NPDES No. CAS000002) requires that a SWPPP be prepared by a Qualified SWPPP Developer that includes BMPs to reduce erosion of disturbed soils. The impact would be less than significant with implementation of Midpen's BMPs and a SWPPP, where required.

Impact Hydrology-2: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Program may impede sustainable groundwater management of the basin.	**Significance Determination**
	Less than significant

The majority of Midpen lands are located in the upgradient of the Santa Clara Valley groundwater basin, and no substantial groundwater basins are located beneath Midpen lands (DWR, 2016). SGMA requires local public agencies and GSAs in high- and medium-priority basins to develop and implement Groundwater Sustainability Plans (GSPs). GSPs are detailed road maps for how groundwater basins will reach long term sustainability. The Santa Clara Subbasin (Basin 2-009.03) is rated as high priority under SGMA. Valley Water is the GSA for the Santa Clara Subbasin, which is sustainably managed through the comprehensive activities described in Valley Water's 2016 Groundwater Management Plan (Valley Water, 2016). Midpen currently does not use groundwater because of limited groundwater production capabilities in the area (California Water Service, 2016).

Implementation of the Program would result in neither impacts related to depletion of groundwater supplies nor the implementation of Valley Water's 2016 Groundwater Management Plan. Implementation of the Program would use substantial groundwater as most activities do not require extensive use of water. Water for dust control or for fire control during a prescribed burn could be purchased from an existing source or from existing entitlements held by Midpen. Implementation of the Program would not significantly increase impervious surfaces within Midpen lands. The impact would be less than significant.

Impact Hydrology-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	Significance Determination
i) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; ii) Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iii) Impede or redirect flood flows.	Less than significant with mitigation

Physical alteration of streams or rivers is not proposed for the Program, thus the existing drainage patterns within Midpen lands would not be intentionally altered. Unintentional alteration of streams or rivers could occur from landslides or debris flows resulting from vegetation-management activities or from sedimentation as a result of erosion, which would be a significant impact if alterations were substantial. Impacts associated with potential landslides are discussed further in Section 4.6: Geology and Soils, and both landslide risk and impacts from erosion and sedimentation would be minimized with implementation of IPMP BMP 28 as well as MM Geology-2, where applicable. Travel and equipment transport to treatment sites could, on rare occasions for creation or maintenance of FRAs, include in-channel stream or creek crossings and result in a significant impact if vehicles enter protected waters. Midpen's IPMP BMP 28 requires implementation of erosion-control measures near aquatic features that could be adversely affected by an influx of sediment. MM Hydrology-1 requires avoidance of instream crossings, if feasible, or implementation of protection measures to minimize the effects of the crossings on the stream and bank if the crossing is required. Impacts would be less than significant with implementation of this mitigation measure.

During storm events, concentrated surface-water flows run down roads and trails and along gullies and other natural drainage features. Culverts are often found where roads and trails cross streams or drainages. Though the Program would not intentionally alter the course of a stream or river, minor alteration of the existing drainage pattern could occur as a result of additional impervious surfaces. No substantial increase of impervious surfaces is proposed in the Program, but minor additions (such as for added infrastructure) could occur as a result of Program implementation. Implementation of prescribed burns could expose soils and potentially alter drainage patterns through increased surface runoff. The Program may include new or expanded roads and wildland fire infrastructure detailed in a Wildland Fire Pre-Plan, and surface-water flows may increase in treated areas. Additional water-storage tanks, pumps, and hydrants would increase impervious surfaces within Midpen lands; however, any additional impervious surfaces would be minimal in relation to the majority of unpaved open space within Midpen lands. Groundcover less than 70 percent has been found to result in excessive runoff and erosion. MM Geology-2 requires implementation of numerous erosion-control measures where Program activities would reduce groundcover to less than 70 percent and on steep slopes, thereby reducing a substantial increase in surface runoff. Minor increases in surface-runoff rates resulting from additional hydrophobic soils would not be significant on a large scale due to other sources of infiltration throughout Midpen lands and

would neither result in flooding on or off site nor impede or redirect flood flows. The degree of vegetation management activities and the dispersed locations where minor increases in surface runoff could occur would not result in substantial additional sources of polluted runoff or exceed the capacity of existing stormwater-drainage systems. Implementation of the Program would not result in major drainage changes that could alter the existing drainage pattern of the Program area. The impact would be less than significant with mitigation.

	Significance Determination
Impact Hydrology-4: Risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones.	**Less than significant**

The Program covers a hilly, mountainous, primarily inland area, which precludes the chance of the area being inundated by tsunami. Creeks and streams that originate in the Santa Cruz Mountains and flow through San Mateo and Santa Clara counties are the source of periodic flooding in Santa Clara Valley and areas near the San Francisco Bay in San Mateo County. Midpen participates in flood-protection programs throughout the region, including constructing major flood-protection projects and protection of properties in previously flood-prone areas (Midpen, 2014c). Risk of tidal flooding is prevalent in Ravenswood and Stevens Creek OSPs; however, vegetation management and soil-disturbing activities are not proposed for these areas under the VMP. Seiche events are not likely to occur within Midpen lands due to site elevation and distance from the Pacific Ocean and San Francisco Bay. Implementation of activities described in the Program could not cause seiches or flooding due to the nature of the activities proposed. The Program would not involve storage of hazardous materials that could be released in the event of inundation. The impact would be less than significant.

	Significance Determination
Impact Hydrology-5: Conflict with or obstruct implementation of a water-quality control plan or sustainable groundwater management plan.	**Less than significant with mitigation**

Basin Plan

A project could interfere with the Basin Plan by degrading water quality in such a way that identified water-quality objectives or strategies are not met and beneficial uses are impacted or not achieved. The Basin Plan identifies beneficial uses for many of the waterbodies within and downstream of Midpen lands.

As analyzed under Impact Hydrology-1, the Program has the potential to impact water quality of waterbodies within and surrounding Midpen lands. Increased erosion and consequent sedimentation could occur following manual and mechanical methods of vegetation management, prescribed burning, prescribed herbivory, and vehicle travel. Eroded sediments could carry natural metals, nutrients, or pathogens, impacting efforts to achieve or maintain identified TMDLs, objectives, and ultimately the described beneficial uses of waterbodies. All surface waterbodies identified in Table 4.9-3 downstream of Midpen lands could be impacted

by additional contaminants as a result of Program implementation. Increased contamination of an impaired waterbody or waterway, such as additional sedimentation in San Gregorio Creek or San Francisquito Creek, would conflict with the Basin Plan. The impact from conflict with the Basin Plan could be significant.

Midpen's IPMP BMP 28 requires implementation of erosion-control measures on sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment. MM Geology-1, MM Geology-2, and MM Geology-3 require implementation of additional erosion-control measures to minimize erosion associated with specific Program activities, including prescribed herbivory, prescribed burns, pile burns near waterways or waterbodies, and creation of new fire lines. Impacts from vehicle fuel or lubricant spills near waterbodies or waterways could also be significant. Fueling and any fuel spills would be handled according to Midpen's spill-prevention and handling-of-hazardous-materials BMPs (MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). These BMPs would ensure that hazardous materials are properly stored on site and that any accidental spills of hazardous materials would be properly controlled and quickly cleaned up. Due to the small quantity of fuel needed, any incidental spills would not pose a significant impact on waterbodies or waterways. Mitigation would ensure that erosion and sedimentation does not substantially increase and that no conflict with identified TMDLs or objectives and beneficial uses identified in the Basin Plan would occur. Impacts would be less than significant with mitigation.

For most activities, water bodies can be avoided by using existing roads and trails with the appropriate water body crossings. On a very rare occasion while working in more interior areas such as on FRAs, water bodies may need to be crossed with equipment where there is not an existing crossing. While unlikely, should vehicles need to cross a waterways, sedimentation and erosion could occur. MM Hydrology-1 requires that instream crossings be avoided to the greatest extent feasible. On the rare occasion where instream crossings cannot be avoided, MM Hydrology-1 requires that instream crossings occur when the stream is dry, with no alteration to the stream bed and bank, unless a Section 1602 and potentially a Section 404 permit is obtained, with restoration of the area after work is completed to compensate for impacts. Impacts due to instream crossings would be less than significant with implementation of MM Hydrology-1.

Sustainable Groundwater Management Plan

In 2019, the Santa Clara Subbasin was rated as high priority under SGMA, thus requiring the preparation of a GSP or alternative (DWR, 2019). Valley Water, as the GSA, manages groundwater resources in the Santa Clara Subbasin through the 2016 Groundwater Management Plan. Steven's Creek Shoreline Nature Area and Fremont Older OSPs are located within the Santa Clara Subbasin. One of the sustainability goals of the 2016 Groundwater Management Plan is to protect groundwater from contamination. Valley Water implements numerous activities as well as a comprehensive monitoring program to protect groundwater resources.

A small portion of Midpen lands is underlain by the Santa Clara Subbasin and are subject to Valley Water's 2016 Groundwater Management Plan goals and strategies. As discussed under Impact Hydrology-2, Program activities would not result in impacts related to depletion of groundwater supplies. No groundwater pumping would occur during Program implementation as most activities would not require extensive use of water. Water for dust control or for fire control during a prescribed burn could be purchased from an existing source or from existing entitlements held by Midpen. Program activities would not affect the implementation or success of Valley Water's 2016 Groundwater Management Plan. The impact would be less than significant.

4.9.6 Mitigation Measures

MM Hydrology-1: Water Quality Protection During Waterway Crossing or Work Near Waterbodies

Vehicles and heavy equipment shall avoid instream crossings. On rare occasions, such as to perform work to create or maintain FRAs, equipment may need to access off an existing road into a treatment area through a waterbody. If instream (waterway) crossings must occur because no other options for access are reasonably available, the crossing shall be performed when the stream is dry and soils are not saturated. The crossing shall be performed in a way that does not result in any permanent alteration of the stream bank or bed (e.g., choosing areas with stable soils and the least slope or with vegetation to protect the bed and bank). If water is flowing or the stream has flow or saturation, temporary plates or the equivalent shall be installed from bank to bank for equipment access across the waterway. If an instream crossing that could impact the bank or bed or riparian vegetation is needed, the crossing shall only be performed after and in accordance with the appropriate 1602 Streambed Alteration Agreement from CDFW and Section 404 and 401 Clean Water Act permits. All soils shall be restored after the instream crossing and banks revegetated, as needed, after the work is completed, in accordance with permits.

Applicable Location(s): Anywhere vehicles and heavy equipment must cross streams or creeks (waterways).

Performance Standards and Timing:

- **Before Activity:** (1) Obtain permits and (2) install plates or record vegetative conditions, as appropriate.
- **During Activity:** Minimize soil or vegetation disturbance, as appropriate.
- **After Activity:** Restore crossing area.

MM Geology-1: Prescribed Herbivory Land and Trail Control

See Section 4.6: Geology and Soils

MM Geology-2: Erosion Control and Slope Stability Measures

See Section 4.6: Geology and Soils

MM Geology-3: Fire Lines During Prescribed Burns

See Section 4.6: Geology and Soils

4.10 Noise

4.10.1 Introduction

This section provides an overview of the existing noise conditions in the Program area and a discussion of potential impacts related to noise as a result of Program implementation. This analysis is based on estimated noise levels generated by equipment and the resultant noise-level calculations at sensitive receptors as well as a review of existing noise environments in the Program area. No comments related to noise impacts were received during the public scoping period.

4.10.2 Definitions

Overview

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities (e.g., sleep, speech, recreation, or tasks demanding concentration or coordination) or when it has adverse effects on human or environmental health. Various noise descriptors are used to quantify the sound experience, dependent upon different time scales and perception. Noise terms are described in greater detail below.

Sound

Sound Pressure

Sound is an air pressure fluctuation from a source that travels through a medium, such as air, to a receiver, such as the human ear (Caltrans, 2009). Sound is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A sound level of zero dB corresponds to the minimum threshold of human hearing for those without hearing damage (Ray, 2013). The average threshold of hearing is close to 10 dB (Caltrans, 2009).

Individual dB ratings for different noise sources cannot be added directly to give the combined noise level from all sources; instead, the combined noise level produced by multiple noise sources is calculated using logarithmic summation. For example, if one noise source produces a noise level of 80 dB, then two of the identical sources side by side would generate a combined noise level of 83 dB, or an increase of approximately three dB. Sound-pressure levels are not a reliable indicator of loudness (Caltrans, 2009).

A-Weighted Sound Level

The A-weighted sound level (dBA) is a sound pressure measurement that de-emphasizes the very low- and very high-frequency components of the sound. The de-emphasis of the very low and high frequencies mimics the frequency response of the human ear and correlates well with subjective reactions to noise (Caltrans, 2009). The A-weighting, therefore, assists in the analysis of how humans perceive and respond to sound and noise.

Typical A-weighted noise levels measured in the environment and in industry are provided in Figure 4.10-1. A three-dBA change in environmental noise is barely perceptible while a five-dBA change is readily perceptible by the human ear (Caltrans, 2009). An increase or decrease of 10 dB in sound pressure is perceived by an observer to be a doubling or halving of the sound, respectively (FHWA, 2017).

Noise

Equivalent Sound Level

Equivalent sound level (L_{eq}) is the average A-weighted sound level during the entirety of a stated time period (Caltrans, 2009). L_{eq} time periods in this analysis are one hour unless otherwise noted. The L_{dn} is the L_{eq}, or Energy Equivalent Level, of the A-weighted noise level over a 24-hour period with a 10-dB penalty applied to noise levels between 10 p.m. to 7 a.m.

Maximum Sound Level

Maximum sound level (L_{max}) is the highest instantaneous noise level during a specified time period. This descriptor is sometimes referred to as "peak [noise] level" (Caltrans, 2009).

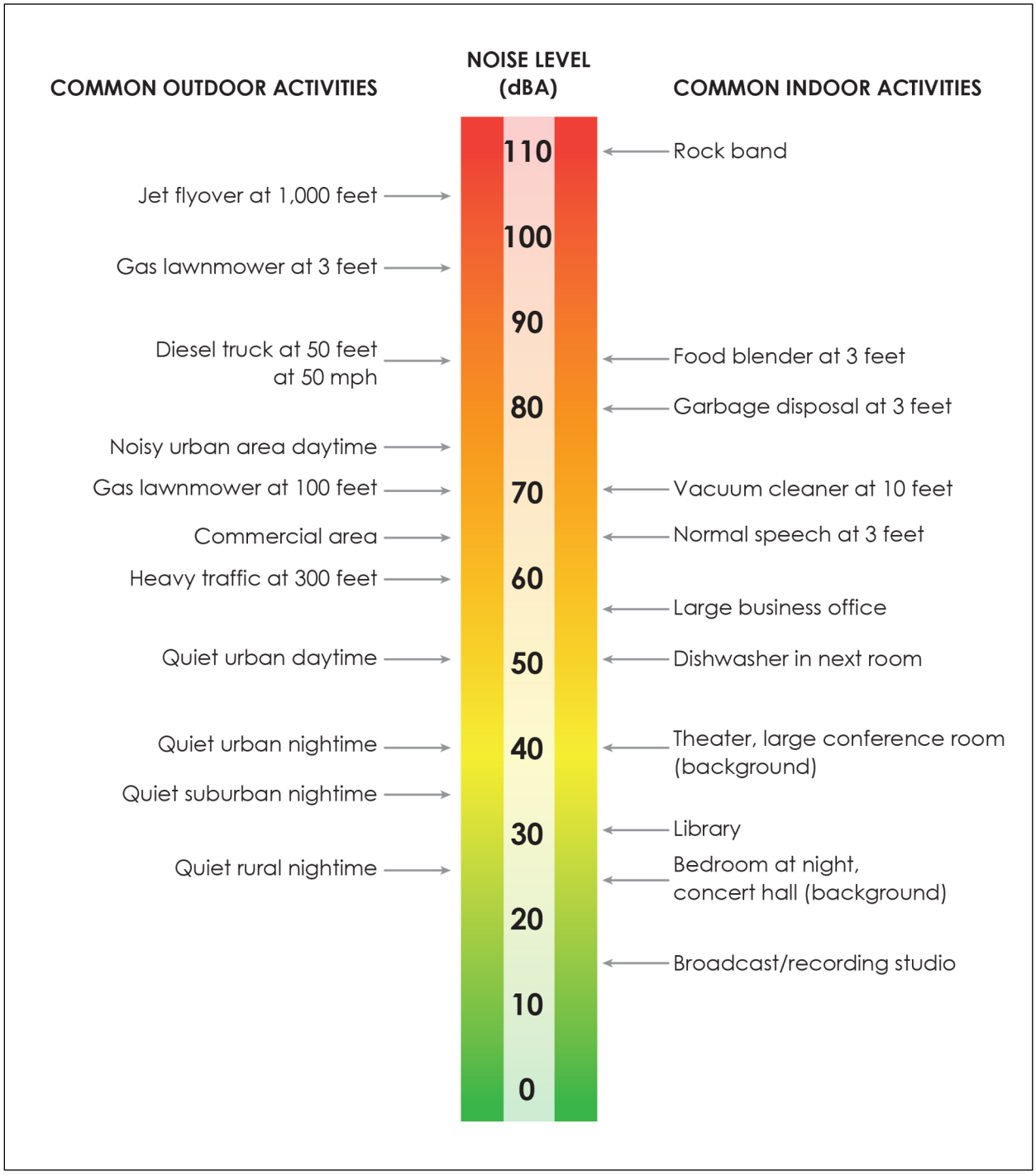
Noise Attenuation

Most noise sources can be classified as either point sources, such as stationary equipment, or line sources, such as a roadway. Sound generated by a point source nominally diminishes (attenuates) at an approximate rate of 6 dBA for each doubling of distance away from the source. For example, a 60 dBA noise level measured at 50 feet from a point source would be approximately 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Noise from a line source (e.g., roadways or corona noise from a transmission line) nominally attenuates at approximately 3 dBA per doubling of distance (USDOT, 1995).

One row of buildings between a noise source and receptor provide a 4.5 dB reduction due to shielding, with each subsequent row resulting in an additional 1.5-dB reduction for up to 10 dB total (FTA, 2018). The exterior walls of residences and buildings typically reduce outdoor noise levels by 12 to 15 dBA if windows are open and between 20 to 25 dBA if windows are closed, depending on the age of the structure. An acoustically well-insulated structure can provide around 35 dBA of noise attenuation when windows and doors are kept closed (Wyle Laboratories, 1994).

Vegetation, topography, and other structures can reduce noise levels that reach a receiver by serving as a barrier that deflects or absorbs sound. The effects of vegetation on noise levels varies widely based on the type, height, and density of the vegetation in relation to the location of a noise receptor. Generally, the forest floor provides the greatest noise attenuation due to absorption within a forest. A lower level of noise attenuation occurs within the canopy of a forest primarily because tree stems and branches scatter rather than absorb noise (Herrington & Brock, 1977). Provided trees are taller than the noise receptor, dense trees can appreciably reduce noise levels (Chih-Fang Fang, 2003). The effect topography has on noise levels varies substantially and is highly dependent upon the complexity of the terrain, location of the source of noise, and location of the receptors.

Figure 4.10-1 Common Noise Levels



Source: (Caltrans, 1998)

Topography, such as a hill, can serve as a noise barrier for receptors on the opposite side of the hill from a source of noise. Topography must be at least high enough to obscure a line of sight between a noise source and receptor to serve as a noise barrier. The area behind the hill where noise would be dampened is considered the shadow region (Salomons, 2001). Conversely, sound can reverberate or reflect off of topography (such as in a canyon), increasing noise on the side of the hill where the noise was created (Truax, 1999).

Meteorological Effects on Noise

Noise levels can be affected by changes in atmospheric conditions, including wind, humidity, and air temperature. Wind bends sound waves, resulting in greater noise downwind of the source and less noise upwind of the source. High winds can result in localized noise-level changes. Temperature gradients can affect noise levels. As humidity decreases, so does noise. Changes in temperature and humidity can result in significant noise variations over long distances (Caltrans, 2009).

4.10.3 Existing Environment

Existing Noise Levels and Noise Sources

Midpen lands are generally undeveloped open spaces with some sparse residences occupied by employees and members of the public and low-intensity non-production agriculture. Midpen lands abut a variety of uses, from open space, to rural residential, to highways. Typical ambient noise levels likely to be found within Midpen lands, and adjacent uses are shown in Table 4.10-1. In areas adjacent to high volume roadways, such as SR-17 or Highway 35, ambient noise levels are anticipated to be higher.

Table 4.10-1 Range of Ambient Noise Likely to Occur Within and Surrounding Midpen Lands

Noise Environment	Outdoor Ambient Noise Environment (L_{eq})	
	7:00 a.m. – 10:00 p.m. (Daytime Average)	10:00 p.m. – 7:00 a.m. (Nighttime Average)
Quiet urban residential	46 – 50 dBA	40 dBA
Quiet rural/ Forest habitat	44 dBA	25 dBA
Quiet suburban residential	36 – 40 dBA	35 dBA
Rural and undeveloped areas	33 – 47 dB L_{dn}	

Source: (USEPA, 1971; Caltrans, 2009; USFS, 2006; Eldred, 1981)

Noise-Sensitive Receptors

Noise-sensitive receptors are land uses where an excessive amount of noise would interfere with normal activities. Noise-sensitive receptors are primarily residences, educational facilities, libraries, hospitals, places of worship, schools, childcare centers, nursing homes, and passive recreation areas (Caltrans, 2011).

Midpen properties are in rural parts of their respective counties as well as 17 local jurisdictions (cities and towns) and are not in close proximity to a large number of sensitive receptors. The low intensity of development, activities, and uses on OSPs makes for a quiet noise environment. Noise levels are highest near heavily traveled roads and highways; however, the topography of Midpen lands and the pervasive vegetative cover provides a degree of noise attenuation from road and highway noise.

Noise-sensitive receptors on or adjacent to OSPs would include recreational visitors and occupied residences; however, the latter are scattered in low-density development patterns, primarily along SR-35 (Skyline Boulevard). Other nearby receptors adjacent to Midpen lands include assisted-living facilities (e.g., Sequoias-Portola Valley Retirement Home), and schools (e.g., La Honda Elementary School and Kings Mountain Elementary School). Sensitive receptors are similar to those discussed and shown in Section 4.3: Air Quality.

4.10.4 Regulatory Setting

Federal and State

No federal or state programs or policies addressing noise thresholds pertain to the analysis of noise impacts for the Program.

Local

Midpeninsula Regional Open Space District – Resource Management Policies

Midpen's resource management includes management of natural, cultural, and agricultural resources. Midpen recognizes a quiet noise environment as one of the primary benefits of open space (Midpen, 2014a). This policy must be considered when assessing the noise generated by vegetation-management activities:

> **Policy SA-3** Minimize unnatural noise within preserves.

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014b). The following themes and goals pertain to noise on Midpen lands and must be considered when conducting noise-generating activities associated with the Program:

Quiet Enjoyment of Nature:

- Provide opportunities for people to experience, enjoy, and interpret the beauty and tranquility of natural open space.
- Increase access to quiet places to enjoy vistas, encourage connections with nature, and take refuge from urban life.

San Mateo County – General Plan

The following goals and objectives regarding Noise Policies in the San Mateo County General Plan are applicable to noise and relate to the potential for noise-generating Program activities to disturb sensitive uses (San Mateo County, 2013):

16.1 **Strive Toward a Livable Noise Environment**. Strive toward an environment for all residents of San Mateo County which is free from unnecessary, annoying, and injurious noise.

16.2 **Reduce Noise Impacts Through Noise/Land Use Compatibility and Noise Mitigation**. Reduce noise impacts within San Mateo County through measures which promote noise/land use compatibility and noise mitigation.

16.3 **Promote Protection of Noise Sensitive Land Uses and Noise Reduction in Quiet Areas and Noise Impact Areas**. Promote measures which: (1) protect noise sensitive land uses, (2) preserve and protect existing quiet areas, especially those which contain noise sensitive land uses, and (3) promote noise compatibility in Noise Impact Areas.

16.4 **Noise Reduction Priority**. Give priority to reducing noise at the source rather than at the receiver, recognizing that it is less expensive and more equitable to build noise mitigation into the source than providing for it along the path and at the receiver.

16.5 **Noise Reduction Along the Path and at the Receiver**. Promote noise reduction along the path and at the receiver through techniques which can be incorporated into the design and construction of new and existing development including, but not limited to, site planning, noise barriers, architectural design, and construction techniques.

San Mateo County – Noise Ordinance

The San Mateo County Noise Ordinance (Chapter 4.88: Noise Control) contains exterior noise limits for sensitive receiving land uses (Sec. 4.88.330). The following noise limit exemption applies to the Program since vegetation-management work is a type of construction work using similar equipment and having similar noise profiles (San Mateo County, 2019):

> **Sec. 4.88.360. Exemptions.**
>
> The following activities shall be exempted from the provisions of this chapter:
>
> e) Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 6:00 p.m. and 7:00 a.m. weekdays, 5:00 p.m. and 9:00 a.m. on Saturdays or at any time on Sundays, Thanksgiving and Christmas.

Santa Clara County – General Plan

The Safety and Noise Chapter of the Santa Clara General Plan includes policies providing guidelines for noise levels (Santa Clara County, 1994). Under the Noise Compatibility Standards, exterior noise levels above 55 dB Ldn are considered incompatible with Open Space Preserves and residential land uses. Residences in agricultural areas are not subject to other residential standards. Exterior noise levels over 60 dBA at hospitals, nursing homes, churches, schools, and libraries are considered incompatible. Permanent, constant noises could cause long-term incompatibilities. The noise-generating Program activities would not be permanent and would be infrequent in any one location, similar to construction activities. The strategies and policies that may apply to the Program are listed below:

Strategy #1 Prevent or Minimize Noise Conflicts

Strategy #2 Provide Adequate Sound Buffers

C-HS 25 Noise impacts from public and private projects should be mitigated.

Santa Clara County – Noise Ordinance

The Santa Clara County Noise Ordinance (Chapter VII: Control of Noise and Vibration) contains exterior noise limits for sensitive receiving land uses (Sec. B11-152) (Santa Clara County, 2019).While the Noise Ordinance sets these maximum limits, section B11-156, Special Provisions, creates an exemption for construction/demolition work. For the purposes of the WFRP, construction equipment generates similar types of noise as equipment used for vegetation management, and thus the exemption is assumed to apply and Midpen's activities would not be subject to the Exterior Noise Standards (Sec. B11-152). The following construction and demolition noise standards are assumed to apply to the Program activities:

Sect. B11-156. Special Provisions.

(d) Exemption from Exterior Noise Standards. The provisions of Sec. B11-152 shall not apply to activities covered by the following sections:

(3) B11-194 (6) construction/demolition

Sec. B11-154. Prohibited Acts.

(b) Specific prohibitions. The following acts, and the causing or permitting thereof, are declared to be in violation of this chapter:

(6) Construction/demolition.

a. Operating or causing the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between weekdays and Saturday hours of 7:00 pm and 7:00 am, or at any time on Sundays or holidays, such that the sound there from creates a noise disturbance across a residential or commercial real property line, except for emergency work of public service utilities or by variance. This section will not apply to the use of domestic power tools as specified in Subsection 11.

b. Where technically and economically feasible, construction activities shall be conducted in such a manner that the maximum noise levels at affected properties will not exceed those listed in the following schedule:

i. Mobile equipment. Maximum noise levels for nonscheduled, intermittent, short-term operation (less than ten days) of mobile equipment (refer to Table 4.10-2 below):

Table 4.10-2 Maximum Noise Levels of Mobile Equipment

	Single- and Two-Family Dwelling Residential Area	Multifamily Dwelling Residential Area
Daily, except Sundays and legal holidays 7:00 a.m.—7:00 p.m.	75 dBA	80 dBA
Daily, 7:00 p.m. – 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA

ii. Stationary equipment. Maximum noise levels for repetitively scheduled and relatively long-term operation (periods of 10 days or more) of stationary equipment (refer to Table 4.10-3 below):

Table 4.10-3 Maximum Noise Levels of Stationary Equipment

	Single- and Two-Family Dwelling Residential Area	Multifamily Dwelling Residential Area
Daily, except Sundays and legal holidays 7:00 a.m.—7:00 p.m.	60 dBA	65 dBA
Daily, 7:00 p.m. – 7:00 a.m. and all day Sunday and legal holidays	50 dBA	55 dBA

(7) Vibration. Operating or permitting the operation of any device that creates a vibrating or quivering effect that:

a. Endangers or injures the safety or health of human beings or animals;
b. Annoys or disturbs a person of normal sensitivities; or
c. Endangers or injures personal or real properties.

Santa Cruz County – General Plan

The Santa Cruz County General Plan Public Safety and Noise Element states that noise-sensitive land uses include residential (residences, hotels, and motels), institutional (schools, libraries, museums, hospitals, personal care, meeting halls, and churches), and office (office buildings, business commercial, and professional) uses. The recommended exterior noise limit for all noise-sensitive land uses is 60 dB L_{dn} (or CNEL), and the recommended maximum interior noise level is 45 dB L_{dn} (or CNEL). Permanent, constant noises could cause long-term incompatibilities. The noise-generating Program activities would not be permanent and would

be infrequent in any one location, more similar to construction activities. The Public Safety and Noise Element also includes goals and policies to regulate noise sources (Santa Cruz County, 1994).

Santa Cruz County – Noise Ordinance

The Santa Cruz County Noise Ordinance (Chapter 8.3: Noise) contains the following noise limits and restrictions that are applicable to the noise-generating Program activities (Santa Cruz County, 2019):

Sec. 8.30.010 Offensive Noise.

(B) "Offensive noise" means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, activity, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, tool, structure, construction, vehicle, ride, machine, implement, or instrument.

(C) The following factors shall be considered when determining whether a violation of the provisions of this section exists:

(1) Loudness (Intensity) of the Sound.

(a) Day and Evening Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 8:00 a.m. and 10:00 p.m. and it is:

(i) Clearly discernible at a distance of 150 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 75 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(b) Night Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 10:00 p.m. and 8:00 a.m. and it is:

(i) Made within 100 feet of any building or place regularly used for sleeping purposes; or

(ii) Clearly discernible at a distance of 100 feet from the property line of the property from which it is broadcast; or

(iii) In excess of 60 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

(2) Pitch (frequency of the sound, e.g., very low bass or high screech;

(3) Duration of the sound;

(4) Time of day or night;

(5) Necessity of the noise, e.g., garbage collection, street repair, permitted construction activities;

(6) The level of customary background noise, e.g., residential neighborhood, commercial zoning district, etc.; and,

(7) The proximity to any building regularly used for sleeping purposes.

4.10.5 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on noise would be considered significant if they would exceed the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generate excessive groundborne vibration or groundborne noise levels; or
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

(See CEQA Guidelines, Appendix G, I.)

Significance Thresholds

Implementation of the Program would involve use of several different tools and techniques to implement fuel reduction and vegetation management activities. All of the activities would occur annually, but in the majority of cases, for only a few hours to a few days in any one location. Some activities under the Program may require more concentrated work in a particular area for a few weeks at a time (e.g., installation of a water tank and associated piping or creation

of new fuelbreaks through dense forest). Noise impacts are therefore temporary, as evaluated under CEQA, and are construction-like in character.

The majority of Program activities would be conducted in San Mateo, Santa Clara, and Santa Cruz counties; however, a small portion of Midpen lands (approximately 10 percent) falls within various cities' jurisdictions. The analysis focuses on local county policies and regulations as most of Midpen land falls within the counties rather than cities, but Midpen is required to adhere to all local regulations. San Mateo, Santa Clara, and Santa Cruz counties each have established various noise standards as well as designated daytime and nighttime hours. Significance thresholds used in this CEQA analysis are as follows, by jurisdiction:

- **San Mateo County** does not have specific noise limits for construction noise, which is most similar to the noise generated from Program activities, as long as noise is not generated between 6:00 p.m. and 7:00 a.m. weekdays, 5:00 p.m. and 9:00 a.m. on Saturdays or at any time on Sundays, Thanksgiving, and Christmas. If construction hours are followed, noise impacts would be less than significant.
- **Santa Cruz County** defines "offensive" noise as noise greater than 75 dBA at the property line during daytime hours. This limit is not a strict limit, and exceedances may be considered acceptable under certain conditions, particularly considering the "necessity of the noise, e.g., garbage collection, street repair, permitted construction activities." If noise levels at the property line are under 75 dBA where it is feasible to be kept under 75 dBA, noise would not be significant. If noise exceeds 75 dBA and there is no reasonable or feasible way to reduce it (it is necessary to accomplish the program's goals) then the noise would not be in violation of the ordinance and would be less than significant. Feasible, for the purposes of this EIR is assumed to encompass a reasonable and efficient method to perform the work in accordance with standard practices.
- **Santa Clara County** establishes noise limits of not more than 75 dBA at the receptor for mobile noise sources lasting less than 10 days and not more than 60 dBA at the receptor for stationary sources for durations of 10 days or longer, but these limits also have exceptions. The noise ordinance states that these limits should be maintained "where technically and economically feasible" and apply to "non-scheduled" work. Assuming Midpen could schedule and notify receptors near activities where it is not feasible to reduce noise levels below standards (where feasible is assumed to encompass a reasonable and efficient method to perform work in accordance with standard practices), a violation of the noise ordinance generally would not occur, and impacts would be less than significant.

Nighttime work is not anticipated, but were it to occur, the local standards would apply, which require that work not occur:

- Between 6:00 p.m. and 7:00 a.m. weekdays, 5:00 p.m. and 9:00 a.m. on Saturdays or at any time on Sundays, Thanksgiving, and Christmas in San Mateo County, unless the bid contract states the work is for the public good;

- Between 10:00 p.m. and 8:00 a.m. in Santa Cruz County and generate noise at the nearest sensitive receptor at a level greater than 60 dBA; or
- Between 7:00 p.m. and 7:00 a.m. in Santa Cruz County and generate noise at the nearest sensitive receptor greater than 50 dBA.

Analysis Methodology

The analysis is focused on whether activities under the Program would comply with noise ordinances as applicable to the work (primarily daytime and nighttime hours of work). Noise levels from various types of equipment have been calculated to show the distance at which noise does not exceed general thresholds of Santa Clara and Santa Cruz counties' Noise Ordinances (i.e., 75 dBA maximum daily noise level for work under 10 days and 60 dBA maximum daily noise level for work over 10 days for Santa Clara County and under 75 dBA for Santa Cruz County). However, the analysis notes that where it is technically not feasible to reduce noise levels below that level, as long as the activity is scheduled as well as necessary and beneficial (e.g., to remove hazardous trees or create and maintain defensible space) and everything possible is done to reduce the noise, it would not result in a significant impact. Noise impacts are less than significant for work occurring in San Mateo County, if work falls within the allowable hours.

Noise levels for vegetation management activities were estimated using the Roadway Construction Noise Model[1] (RCNM v.1.1), which involves identifying and using the following values to determine the L_{eq}:

- The L_{max} of each piece of equipment or an equivalent piece of equipment
- The duration of noise generating activities, including the hourly-use percentage of each piece of equipment (called "hourly-use factor") to determine the hourly L_{eq}

The analysis then identifies the noise (L_{eq}) at 50 feet as a reference point.

Sound from a noise-generating source decreases as distance increases (attenuation) and conversely increases as distance decreases, as discussed in Section 4.10.2: Definitions. Most noise-generating equipment involved with vegetation management activities would be considered mobile sources generating slow-moving noise, which are best classified as "point," or singular, noise sources and fluctuating noise sources. For the purposes of this impact analysis, it is conservatively assumed that noise levels from equipment would decrease by

[1] RCNM equipment usage factors represent the typical percentage of time that the equipment would be operating at full power during an hour of use. This construction-noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). Where equipment was not listed in the RCNM model (e.g., mowers) similar equipment that generally had the same L_{max} and usage factor was used as a proxy.

6 dBA per doubling of distance and increase by 6 dBA per halving of distance. Mitigation is prescribed to make all best efforts to reduce noise below Santa Clara County's conditional limits of 75 dBA maximum daily noise level for work under 10 days and 60 dBA maximum daily noise level for work over 10 days and below Santa Cruz County's conditional limits of 75 dBA. Mitigation identifies the distances and timing for Program equipment to reduce noise to acceptable levels wherever it is possible to do so in accordance with the ordinances, for work occurring in Santa Clara and Santa Cruz counties. The closest receptor types or conservative assumptions on the distance to a receptor were selected for analysis purposes.

4.10.6 Impact Analysis

Impact Noise-1: Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the program in excess of standards established in the local general plan or noise ordinance or in the applicable standards of other agencies.	**Significance Determination**
	Less than significant with mitigation

Overview

Fuel management activities currently occur on Midpen lands and involve many of the noise-generating tools and equipment proposed for use under the Program. Existing noise levels vary throughout Midpen lands (higher noise levels in parking areas, near public roads, and areas of concentrated recreation; lower noise levels in more remote areas). The incremental additional noise generated locally due the Program would be minimal compared with the baseline noise level. Many receptors are acclimated to the types of noise that could be generated by the vegetation management activities proposed in the Program, either because they are accustomed to hearing it under existing conditions or are used to similar noise associated with suburban/rural living such as from hedge cutters, lawn mowers, home construction, and road work. The noise would also, in most cases, be brief, particularly for transient receptors, such as recreationists. None of the noise standards identified by the Noise Ordinances for San Mateo County, Santa Clara County, or Santa Cruz County establish a definitive noise threshold that would apply to Midpen activities under the Program during daytime hours, as previously discussed, provided that activities within proximity of sensitive receptors are scheduled (Santa Clara County) and are generally performed to minimize effects to the extent technically feasible with application of mitigation. Nighttime construction hours and limitations would be followed as applicable to each jurisdiction.

Analysis of Tools and Techniques

Manual Techniques

Manual techniques for vegetation removal or other fire management activities include digging and pulling of weeds using shovels, trowels, hatchets, Pulaskis (combination axe and hoe), and weed-pullers and by hand. Manual methods would not generate much noise, and the techniques would have minimal impacts related to noise. The impacts would be less than significant.

Mechanical Techniques

Overview. Mechanical vegetation removal and trimming using powered equipment are the primary techniques that could generate substantial noise. A list of the typical powered equipment, the assumed hourly use factor, and the noise levels at 50 feet is included in Table 4.10-4. Noise from powered equipment used to implement vegetation management activities and other Program activities would be similar to existing noise intrusions from current vegetation management practices in many areas.

Table 4.10-4 Noise Generation Levels of Representative Equipment Used to Implement the Program

Technique		Key Equipment/ Activity Noise	Hourly Use Factor (in Percent)	Noise Levels at 50 Feet (dBA)	
				L_{max}	L_{eq} [a] (threshold exceedances in gray)
Manual and mechanical	Cutting/ mowing	Backhoe	40	78	74
		Excavator	40	81	77
		Skid steer	40	79	75
		Tractor	40	84	80
		Brushcutter[b, c]	40	78	74
		Chainsaw	40	82	77
		Power pole saw[b, c]	40	66	64
		Hand tools[c, d]	40	40	36
	Discing	Tractor with disc harrow	40	84	80
	Pulling	Backhoe	40	78	74
		Excavator	40	81	77
		Hand tools[c, d]	40	40	36
	Masticating	Skid steer with masticating head	40	79	75
		Backhoe with masticating head	40	78	74
		Excavator with masticating head	40	81	77
	Chipping	Chipper[b, c]	40	85	81
	Propane flaming	Voices[b]	--	--	41
	Pile burning	Water pump (on fire engine)	40	81	78
		Leaf blower[b]	40	76	72
		Voices[b]	--	--	41

Technique	Key Equipment/ Activity Noise	Hourly Use Factor (in Percent)	Noise Levels at 50 Feet (dBA)	
			L_{max}	L_{eq} [a] (threshold exceedances in gray)
Chemical application	ATV[b, c]	40	60	56
	Chainsaw	40	82	77
	Power pole saw[b, c]	40	66	64
Prescribed herbivory	Generator	50	81	78
	Livestock	--	--	35
	Dog barking	--	100 - 125	--
Prescribed burning (pre-treatment, burn, and mop up)	Fire engine (Wildland Type 3 or 6)	40	77	73
	Water pump (on fire engine)	40	81	78
	Skid steer	40	79	75
	Tractor	40	84	80
	Chainsaw	40	82	77
	Power pole saw[b, c]	40	66	64
	Leaf blower[b]	40	76	72
Vehicle Travel	Pickup truck	40	75	71
Installation of Infrastructure	Backhoe	40	78	74
	Excavator	40	81	77
	Skid steer	40	79	75
	Generator	50	81	78
	Crane	16	81	73

Notes:

[a] The hourly L_{eq} is based on the hourly use factor and L_{max}.

[b] The noise level at the operator/receptor to noise source is generally three feet for the purposes of determining the noise level at 50 feet.

[c] A usage factor of 40 percent was assumed, similar to other equipment.

[d] Chopping wood is used as a proxy for the upper limit of noise.

Source: (USFS, 2006; USDOT, 2008; Husqvarna, n.d.; Brueck, 2008; Weeks, 2008; Sales, RC, Peyvandi, & Shield, 1997; Polaris, 2014; CHC, n.d.; Olsen, 1998)

Sensitive Receptors. Many residential areas and several other sensitive receptors, including La Honda Elementary School, are directly adjacent to Midpen lands (refer to Section 4.3: Air Quality, Figure 4.3-2 and Table 4.3-3). Several fire management activities involving equipment use, such as fuelbreak creation or installation of firefighting infrastructure, could occur 50 feet

away from these receptors, resulting in noise levels similar to those identified in Table 4.10-4. Most vegetation management activities would occur for fewer than 10 workdays in any one location. Some equipment used for mechanical vegetation management may be used at one location for a longer duration, such as during creation of new fuelbreaks. Proposed activities would occur during the daytime, typically from 7:00 a.m. to 6:00 p.m. but could occur in the evening or nighttime. Each county identifies nighttime noise restrictions. Noise-generating activities that occur near residences and other receptors during the times that each County identifies restrictions for could pose a conflict with the local ordinances. Where the daytime noise generated by equipment during daytime hours could unnecessarily expose sensitive receptors to noise in excess of 75 dBA L_{eq} for work lasting less than 10 days and noise in excess of 60 dBA L_{eq} for work lasting 10 days or longer, a significant impact could occur.

Impacts on sensitive receptors from daytime and potential infrequent nighttime work conflicting with local noise standards would be potentially significant. Midpen prohibits nighttime work that would generate noise in excess of standards for each jurisdiction (cities and counties) and sets a limit of no work until 2 hours after sunrise or 2 hours before sunset for jurisdictions that do not have a time-of-day provision in a noise ordinance (IPMP BMP 29). Following the time limits would ensure any work within San Mateo County is compliant with the ordinance and less than significant.

The impact from noise generated by daytime activities could remain significant for work in Santa Clara or Santa Cruz counties if daytime noise is unnecessarily excessive beyond the conditional thresholds set. MM Noise-1 requires that the appropriate buffer distances are established when operating certain types of equipment near sensitive receptors in Santa Clara and Santa Cruz counties, unless it is technically not feasible to implement the buffer and the work is necessary and beneficial (e.g., creation or maintenance of defensible space within 100 feet of residences or structures). In these cases, work must be scheduled in advance with advance notification to the sensitive receptor. Stationary equipment, such as a wood chipper, should be placed at an appropriate distance to a sensitive receptor and duration of operation of stationary equipment should be minimized, work should be performed when classes are not occurring in schools (when working near schools)o, to keep noise levels below 75 dBA L_{eq} for work occurring in one location under 10 days and under 60 dBA L_{eq} for work occurring in one location for 10 days or longer in Santa Clara County and under 75 dBA L_{eq} for work occurring in Santa Cruz County. The measure also requires designation of a disturbance coordinator, who would be stationed at the work site to address noise complaints and ensure measures are implemented to minimize noise disturbance (only applicable if working in close proximity to a sensitive receptor). The disturbance coordinator can be a worker performing the activities. With implementation of this mitigation measure, noise impacts on sensitive receptors (including residences) from the use of mechanical equipment would not violate local noise standards, and impacts would be less than significant.

Biological Resources. Noise can also have impacts on biological resources. Refer to Section 4.4: Biological Resources for a discussion of noise impacts on sensitive species, particularly marbled murrelets and nesting birds. These impacts are mitigated to less than significant through MMs

Biology-11 and Biology-12. The measures establish additional construction time limits when working during nesting bird season and in marbled murrelet habitat. If noise generating construction activity takes place during the breeding season (March 24 to September 15) within suitable redwood and redwood/Douglas-fir forests, construction activities are restricted to 2 hours after sunrise to 2 hours before sunset to minimize disturbance of potential nesting marbled murrelet using forest habitat, among other restrictions.

Recreationalists. No local noise standards are established for noise impacts on recreationalists. Use of some mechanical equipment could generate temporary increases in ambient noise near recreationalists, as shown in Table 4.10-4. Most recreationalists are only in a single area of Midpen lands for a short duration and would be able to move away from noisy areas with little impact on their experience. Noise impacts from fire management activities on recreationalists would be less than significant.

Chemical Application

Herbicides would be applied in several different ways. Spray or wipe application would generate low levels of noise from workers. Cut-stump application would involve use of chainsaws or pole saws to cut woody plants prior to chemical application, which would generate noise as shown in Table 4.10-4. Typically, chemical application in one area would not be conducted for longer than one day. The impact could be significant if use of equipment were conducted adjacent to sensitive receptors. MM Noise-1 requires chainsaws and pole saws to be used far enough away from sensitive receptors that noise levels do not exceed Santa Clara's and Santa Cruz County's conditional noise limits, such as for hazard tree removal or defensible space creation or defensible space maintenance. The impact from temporary increases in ambient noise levels at sensitive receptors would be in compliance with local standards and would be reduced to less than significant with mitigation.

Prescribed Herbivory

Animal grazing would generate low levels of noise. Grazing livestock and use of guard dogs, if deployed, would generate animals sounds such as bleating, barking, or mooing. Noises from animals would not exceed 60 dBA L_{eq} at sensitive receptors since they most likely would not be positioned close to receptors and due to the intermittent nature of animal noise. Grazing for pre-treatment would generally occur for fewer than 10 days in any one location. Periodic truck visits to refill water troughs would occur every few days. A generator may be used for electric fences or if a shepherd stays on the site to tend the herd. Generators emit noise but would likely not operate frequently. The impact could be significant if the generators were located adjacent to sensitive receptors (within 75 feet). MM Noise-1 requires generators to be located far enough away from sensitive receptors that noise levels do not exceed Santa Clara's and Santa Cruz County's conditional noise limits. The impact from temporary increases in ambient noise levels at sensitive receptors would be reduced to less than significant with mitigation.

Prescribed Burning

Prescribed burns would require the same equipment as pile burns. Equipment used for prescribed burns would be in a work area for fewer than 10 consecutive workdays. Equipment

used for prescribed burns would emit noise less than criteria at about 71 feet. Prescribed burns would not occur in proximity closer than 71 feet to residences, so noise impacts to residences would be less than significant. Recreationalists would move quickly by or could avoid prescribed burn areas. The public would also be kept more than 500 feet away from prescribed burn sites, per MM Hazards-3, due to closure of trails and Midpen-owned or managed roads, for their protection. The impact would be less than significant with mitigation.

Access and Vehicle Travel
Vehicles and trucks would be used in some capacity for all fire management activities, including crew and equipment transport to treatment sites (vehicles and trucks); prescribed burns and other activities needing extra water supply (water trucks and/or fire engines); and prescribed burns and mulching (dump trucks). Midpen does not anticipate constructing any new roads or trails for fire management activities. Skid trails would be re-established through vegetation removal, with the potential for impacts as analyzed above, under Manual Techniques and Mechanical Techniques.

Much of this truck and vehicle activity already occurs on Midpen lands as part of current land-management activities. There is a potential for increased vehicle use under the plan. Given the low noise levels on Midpen lands, truck and vehicle use would result in a relatively high single-event intrusive noise exposure when driving by sensitive receptors. The noise would be brief, and most activities would only require a handful of vehicle trips per day. Vehicles are mobile and would not increase overall ambient noise levels in any one location in violation of local standards. Impacts would be less than significant.

Analysis of Plans

Vegetation Management Plan
Sensitive Receptors
Permanent Increases in Ambient Noise. New VMAs would be created and maintained and continued maintenance of existing fuelbreaks and defensible spaces would occur throughout the life of the Program. The creation and maintenance of VMAs would result in thinned forested areas, including tree removal, which could increase the distance at which noise would attenuate since trees and vegetation can dampen noises (refer to Section 4.10.2: Definitions for more information). Generally, vegetation-thinning activities are proposed around roads or on the edges of OSP boundaries. Receptors are typically located outside OSP boundaries. OSPs are quiet areas with no major noise sources within them. Thinning a forest or removing trees around a receptor, therefore, would not expose the receptor to higher levels of permanent ambient noise once the work is completed. For example, eucalyptus trees are proposed for removal in the vicinity of an assisted living facility at Windy Hill OSP; however, no noise source is located within the OSP that could expose the receptor to ongoing higher noise levels once the eucalyptus are removed. As a result, ambient noise levels are not anticipated to permanently change at sensitive receptors from implementation of the VMP.

Temporary Increases in Ambient Noise. Use of powered equipment for VMP activities (including tree removal) could result in a relatively high temporary intrusive noise exposure

and a substantial increase in ambient noise levels for nearby daytime sensitive receptors given the quiet existing noise environment. Where equipment could generate noise levels at sensitive receptors in excess of 75 dBA L_{eq} for work lasting less than 10 days and in excess of 60 dBA L_{eq} for work lasting 10 days or longer and the noise cannot feasibility be reduced, a significant impact would occur.

Midpen prohibits generation of nighttime noise in excess of city or county standards (IPMP BMP 29). MM Noise-1 requires that the appropriate buffer distances are established when operating certain types of equipment near sensitive receptors to reduce noise to conditional limits where feasible (per the ordinances conditions of feasibility). Impacts would be less than significant with implementation of mitigation.

Recreationalists on Midpen Lands

Maintenance or creation of new VMAs could generate noise that could be a nuisance, but no local noise standards or thresholds have been established for recreational uses. Most recreationalists would only be in a single area of Midpen lands for a short duration and would be able to move away from noisy areas with little impact on their experience. Topography and density of vegetation factor into what level of noise from sources outside an OSP filter into areas traversed by recreationalists. Noise from these sources, such as from major roads and highways, may travel further into the OSPs once vegetation thinning occurs. Due to the complexity of noise attenuation and variables considered, it is not feasible to determine to what level noise may change. However, the change is anticipated to be minimal due to the level of thinning proposed and the size of the OSPs compared with the widths of fuelbreaks; distance tends to be a much greater factor in noise attenuation than tree density (UCSF, 2018). Impacts would be less than significant.

Prescribed Fire Plan

Prescribed burns would be conducted on Midpen lands, which would involve use of equipment for pre-treatment, during the burn, and during mop up after the burn. Prescribed burns may be conducted near trails or Midpen-owned/managed roads where recreationalists travel. Most recreationalists are only in a single area of Midpen lands for a short duration and would be able to move away from noisy areas with little impact on their experience. If a prescribed burn is conducted near a residence in or adjacent to Midpen lands, or near any other sensitive receptor, noise generated by the equipment could result in a significant impact. The noise-generating activities must occur in accordance with the time-of-day requirements of each city or county within which work would occur (IPMP BMP 29). MM Noise-1 requires that the appropriate buffer distances are established when operating certain types of equipment near sensitive receptors in Santa Clara and Santa Cruz County, to keep noise within conditional limits, where feasible (per the ordinances conditions of feasibility). MM Hazards-3 requires trail and Midpen-owned or managed road closures within 500 feet of broadcast burns. This being the case, prescribed burns and any associated equipment used for pre-treatment and mop up would not be conducted within 100 feet from a sensitive noise receptor (the distance needed to attenuate the noisiest equipment to levels at or below 75 dBA L_{eq}). Impacts would be less than significant with implementation of mitigation.

Wildland Fire Pre-Plan

Installation and construction of firefighting infrastructure would involve use of equipment and vehicles. Most recreationalists are only in a single area of Midpen lands for a short duration and would be able to move away from noisy areas with little impact on their experience. Any new water infrastructure would typically be installed near existing infrastructure in areas closer to urban and suburban uses. This being the case, noise generated by equipment could affect adjacent receptors, including schools or residences. Where equipment could generate noise levels in excess of 60 dBA L_{eq} (assuming construction would last more than 10 days), impacts from temporary increases in ambient noise levels could be potentially significant. The noise-generating activities must occur in accordance with the time-of-day requirements of each City or County within which work would occur (IPMP BMP 29). MM Noise-1 requires that the appropriate buffer distances are established when operating certain types of equipment near sensitive receptors in Santa Clara and Santa Cruz counties, unless the noise is necessary and scheduled and it is not feasible to reduce it further. Noise impacts would not exceed local ordinance standards or thresholds such that a violation could occur with implementation of mitigation. Impacts would be less than significant.

Impact Noise-2: Generate excessive groundborne vibration or groundborne noise levels.	**Significance Determination**
	Less than significant

Implementation of the program would involve the use of heavy equipment for vegetation management and operation of trucks, which could generate minor amounts of groundborne vibration. No equipment that could generate a substantial amount of vibration, such as an impact pile driver or compactor, would be used. Ground vibration from heavy equipment and trucks dissipates within a close distance of the source. Vibration from trucks and bulldozers dissipates below the damage threshold for sensitive structures within 10 feet (FTA, 2018). Equipment and trucks would not be used within 10 feet of buildings. Activities would be temporary and periodic. The impact from vibration would be less than significant.

Impact Noise-3: For a program located within the vicinity of a private airstrip or an airport land-use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.	**Significance Determination**
	No impact

The majority of Midpen lands are not located within an area with an airport land-use plan or within the vicinity of a private airstrip. Ravenswood OSP is within 2 miles of the Palo Alto Airport but is not within the airport influence area (Santa Clara County ALUC, 2016). Implementation of the Program would not result in excessive noise levels for receptors in the area from being located within an adopted airport land-use plan or near public airports or private airstrips. No impact would occur.

4.10.7 Mitigation Measures

MM Noise-1: Noise Restrictions

Construction Hours

All construction hours identified in the local noise ordinances shall be followed.

Buffer Zones (Santa Clara and Santa Cruz counties)

Buffer zones shall be established to reduce noise at sensitive receptors to the maximum extent feasible to reduce noise to the conditional limits identified by Santa Clara and Santa Cruz counties' noise ordinances.

The buffer zone distances are shown below that identify the distances needed for noise levels to remain below 75 dBA L_{eq} for work occurring less than 10 days, and below 60 dBA L_{eq} for work occurring for 10 days or longer in Santa Clara County and below 75 dBA Leq for Santa Cruz County. These distances do not need to be implemented where it is not technically feasible to implement them per the applicable noise ordinances that requires that noise must only be reduced where it is possible to do so (i.e., Santa Clara County Noise Ordinance, or considering the necessity of the work in Santa Cruz County).

A violation of the noise ordinances would only occur where the noise exceeded the conditional limits set by the jurisdiction, but there is a feasible way to reduce that noise (e.g., placing a chipper within 50 feet of a receptor when it could feasibly be placed 100 feet away is a violation, but using a chainsaw to cut a large hazard tree within 50 feet of a sensitive receptor would not be a violation assuming no other feasible methods to remove that tree are available).

Equipment	Approximate Buffer Between Equipment and Sensitive Receptors (feet) – for Work Occurring in One Location for Less Than 10 Days (Not to Exceed 75 dBA L_{eq}) in Santa Clara County or for any work duration in Santa Cruz County	Approximate Buffer Between Equipment and Sensitive Receptors (feet) – for Work Occurring in One Location for 10 Days or Longer (Not to Exceed 60 dBA L_{eq}) in Santa Clara County
Chipper	100	568
Tractor	90	506
Generator/ water pump	71	402
Chainsaw/ excavator	64	358
Skid steer	--	284
Backhoe/ brushcutter	--	254
Fire engine/ crane	--	226
Leaf blower	--	201
Pickup truck	--	179
Power pole saw	--	80

Minimization Measures and Disturbance Coordinator

If these restrictions are not implementable between the receptors and a given location, Midpen shall notify the resident or contact at the sensitive receptor within one week of conducting the activity to schedule the activity. Activities shall be coordinated to minimize disturbance to the receptor, such as conducting the work when no one

MM Noise-1: Noise Restrictions

is there. Engineering controls could also be used, if feasible, to keep noise levels below 75 dBA L_{eq} for work occurring in one location for less than 10 days or 60 dBA L_{eq} for work occurring in one location for 10 days or longer. Midpen shall designate a disturbance coordinator to address any noise complaints under these circumstances. The noise coordinator can be the person performing the work.

Applicable Location(s): Midpen lands near sensitive receptors.

Performance Standards and Timing:

- **Before Activity:** Notify affected parties one week before, if applicable.
- **During Activity:** (1) A designated coordinator shall ensure that either setbacks or other conditions are implemented or affected parties are properly notified (if setbacks are not feasible) and (2) a buffer shall be maintained between receptor and equipment, if needed and appropriate.
- **After Activity:** N/A

MM Biology-11: Nesting Bird Protection Measures (With the Exception of Marbled Murrelet)

Refer to Section 4.4: Biological Resources

MM Biology-12: Marbled Murrelet Nest Protection Measures

Refer to Section 4.4: Biological Resources

MM Hazards-3: Safety Around Prescribed Burns

Refer to Section 4.8: Hazards, Hazardous Materials, and Wildfire

4.11 Recreation

4.11.1 Introduction

This section provides an overview of the recreational resources in the Program area and a discussion of potential impacts to recreational resources as a result of Program implementation. This analysis is based on publicly available planning documents, site review, and online resources describing the recreational facilities in the Program area. No comments related to recreation were received during the public scoping period.

4.11.2 Existing Environment

Regional

Midpen lands lie entirely within the Santa Cruz Mountain Region. The eastern edge is heavily influenced by the urban areas of San Francisco, San Jose, and San Francisco Peninsula cities. Midpen lands abut open space owned and maintained by various agencies, as shown in Figure 4.11-1. The agencies with the largest quantity of open space land in the surrounding area include California Department of Parks and Recreation, San Mateo County Parks, Santa Clara County Parks, and POST. Table 4.11-1 lists all of the open space and recreational areas adjacent to Midpen lands. Many of these recreational areas have trailheads and trail connections into Midpen lands.

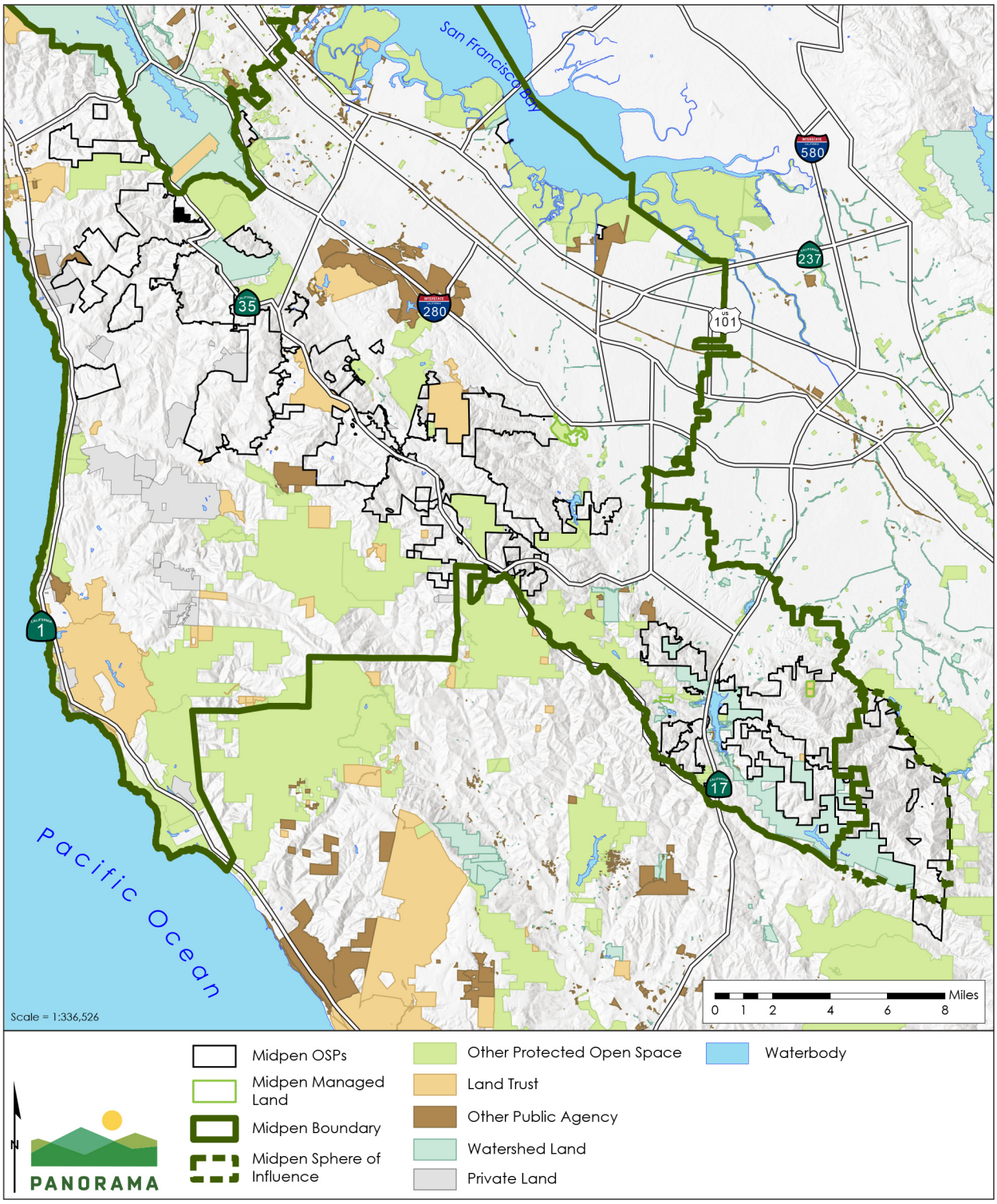
Midpen Lands

Recreation is the primary use of nearly all Midpen lands. Table 4.11-2 lists the recreational facilities within Midpen lands. Ranging from 55 to over 19,000 acres, 24 out of the 27 OSPs are open to the public year-round, free of charge. An estimated two million visitors enjoy visits to Midpen lands each year (Midpen, 2019a). Midpen lands contain numerous public-access areas and include a trail system. Over 240 miles of low-intensity recreational trails, including segments of four regional trails, are located within the OSPs.

Recreational activities within Midpen lands are centered around natural features. Recreational facilities available to the public within the OSPs include trails, restrooms, picnic tables and benches, horse stables, visitor centers, and parking areas. Activities include hiking, dog walking, biking, horseback riding, and picnicking. Special amenities in the OSPs include a backpacking camp (Black Mountain Backpack Camp in Monte Bello OSP), a nature center (David C. Daniels Nature Center in Skyline Ridge OSP), a historic farm (Deer Hollow Farm in Rancho San Antonio OSP), and a winery (Picchetti Winery in Picchetti Ranch OSP).

Midpen has conducted substantial outreach to discourage the public from conducting off-trail recreation through signs, information kiosks, maps, and guidebooks and has informed local recreational groups. Rangers also enforce area closures. The majority of users remain on official trails.

Figure 4.11-1 Open Space Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019b; Midpen, 2018)

Table 4.11-1 Recreation Areas Adjacent to Midpen Lands

Managing Agency	Public Land/Park	Recreational Uses Typically Associated with the Area
California Department of Parks and Recreation	Burleigh H. Murray Ranch	Hiking, historic buildings
	Butano State Park	Hiking, camping, visitor programs
	Portola Redwoods State Park	Hiking, camping, visitor programs, sight-seeing, mountain biking, horseback riding
	Castle Rock State Park	Hiking, camping, horseback riding, mountain biking, sight-seeing
	The Forest of Nisene Marks State Park	Hiking, horseback riding, mountain biking, sight-seeing
San Mateo County Parks	Sam McDonald Park	Hiking, camping, horseback riding
	Huddart Park	Hiking, picnicking, youth programs
	Pescadero Creek Park	Hiking, mountain biking, horseback riding, backpacking
	Memorial Park	Hiking, camping, picnicking, visitor programs
	Wunderlich Park	Hiking, horseback riding, picnicking
	Edgewood Park & Natural Preserve	Hiking, horseback riding, picnicking, sight-seeing
	Tunitas Creek Beach	Swimming, picnicking, fishing
Santa Clara County Parks	Almaden Quicksilver County Park	Hiking, mountain biking, horseback riding, picnicking, fishing, historic site
	Uvas Canyon County Park	Hiking, camping, picnicking, fishing, visitor programs
	Villa Montalvo	Hiking, historic site
	Stevens Creek County Park	Hiking, mountain biking, horseback riding, picnicking, fishing, boating, archery
	Upper Stevens Creek County Park	Hiking, mountain biking, horseback riding
	Sanborn County Park	Hiking, camping, mountain biking, picnicking, fishing
	Lexington Reservoir County Park	Hiking, fishing, boating
	Uvas Canyon County Park	Hiking, camping, picnicking, visitor programs
U.S. Fish and Wildlife Service	Don Edwards National Wildlife Refuge	Sight-seeing, bird watching
City of Palo Alto	Baylands Nature Preserve	Hiking, mountain biking, bird watching, wind surfing and boating, visitor programs

Managing Agency	Public Land/Park	Recreational Uses Typically Associated with the Area
CAL FIRE	Soquel Demonstration State Forest	Mountain biking, hiking

Source: (San Mateo County, 2020; Santa Clara County, 2014; California Department of Parks and Recreation, 2020; Midpen, 2012; POST, 2002)

Table 4.11-2 Recreation Areas on Midpen Lands

Managed Land	Recreational Facilities
Bear Creek Redwoods OSP	• Trails open to hiking and horseback riding • Former Alma College • Stables • Restrooms • Parking lot
Coal Creek OSP	• Trails open to hiking, horseback riding, biking, and dogs on-leash
El Corte de Madera Creek OSP	• Trails open to hiking, horseback riding, and biking • Coastal views • Picnic tables • Restrooms • Parking lots
El Sereno OSP	• Trails open to hiking, horseback riding, biking, and dogs on leash • Permit parking
Felton Station	• Not currently open to the public
Foothills OSP	• Trail open to hiking, horseback riding, and dogs on leash • Scenic viewpoint • Roadside parking
Fremont Older OSP	• Trails open to hiking, biking, and dogs on leash • Benches • Restrooms • Parking lot and roadside parking
La Honda Creek OSP	• Trails open to hiking, horseback riding, and dogs on leash • Scenic vista point • Restrooms • Parking lots
Long Ridge OSP	• Trails open to hiking, horseback riding, biking, and dogs on-leash • Benches • Scenic vistas • Roadside parking

Managed Land	Recreational Facilities
Los Trancos OSP	• Trails open to hiking and horseback riding • San Andreas fault trail • Benches • Restrooms • Parking lot and roadside parking
Miramontes Ridge OSP	• Not currently open to the public
Monte Bello OSP	• Trails open to hiking, horseback riding, and biking • Scenic vistas • Campsite • Benches • Restrooms • Parking lot
Picchetti Ranch OSP	• Trails open to hiking and horseback riding • Picchetti Winery and vineyard • Restrooms • Picnic tables • Parking lots and roadside parking
Pulgas Ridge OSP	• Trails open to hiking and dogs on-leash • Benches • Restrooms • Off-leash dog area • Parking lot
Purisima Creek Redwoods OSP	• Trails open to hiking, horseback riding, and biking • Scenic vistas • Picnic tables • Benches • Restrooms • Parking lots
Rancho San Antonio OSP	• Trails open to hiking, horseback riding, and (limited) biking • Deer Hollow Farm and barn • Benches • Water troughs • Vista points • Restrooms • Parking lots

Managed Land	Recreational Facilities
Rancho San Antonio County Park	• Trails open to hiking, horseback riding, and (limited) biking • Picnic tables • Benches • Model aircraft field • Water troughs • Vista points • Restrooms • Parking lots
Ravenswood OSP	• Trails open to hiking and biking • Benches • Boardwalk • Observation decks • Parking lot
Russian Ridge OSP	• Trails open to hiking, horseback riding, and biking • Viewing platforms • Commemorative site • Restrooms • Parking lots
Saratoga Gap OSP	• Trails open to hiking, horseback riding, and biking • Parking lots and roadside parking
Sierra Azul OSP and Easements	• Trails open to hiking, horseback riding, biking, and dogs on leash • Scenic vistas • Shade structures • Picnic tables • Water troughs • Natural/cultural interpretation • Restrooms • Parking lots and roadside parking
Skyline Ridge OSP	• Trails open to hiking, horseback riding, and biking • Picnic tables • Multimedia nature tours • David C. Daniels Nature Center • Restrooms • Parking lot
St. Joseph's Hill OSP	• Trails open to hiking, horseback riding, biking, and dogs on leash • Benches • Scenic vistas • Roadside parking
Stevens Creek Shoreline Nature Study Area	• Trails open to hiking and biking • Parking lots

Managed Land	Recreational Facilities
Teague Hill OSP	• Trails open to hiking and horseback riding
Thornewood OSP	• Trails open to hiking, horseback riding, and dogs on leash • Parking lot
Tunitas Creek OSP	• Not currently open to the public
Windy Hill OSP	• Trails open to hiking, horseback riding, biking, and dogs on leash • Benches • Picnic tables • Restrooms • Parking lots and roadside parking

4.11.3 Regulatory Setting

Federal and State

No federal or State programs or policies addressing recreational resources pertain to the analysis of recreation impacts for the Program.

Local

Midpeninsula Regional Open Space District – Resource Management Policies

Midpen's resource-management policies include regulations for the management of natural, cultural, and agricultural resources. These policies are used by Midpen to manage its various lands and open spaces, including those that are a part of this Program. Midpen recognizes the protection of recreational resources as one of the primary benefits of open space (Midpen, 2014a). The following strategy relates to recreational resources:

Strategy 2 Support low intensity recreational and agricultural use of District lands consistent with resource protection. Consider present and potential use.

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014b). Midpen uses the Vision Plan to guide management decisions related to the lands and open spaces that would be a part of this Program. The following themes and goals pertain to the scenic resources and qualities of Midpen lands:

Outdoor Recreation and Healthy Living:

- Providing accessible open space lands for recreation and outdoor exercise in a natural setting.

Midpeninsula Regional Open Space District – Regulations for Use of Midpeninsula Regional Open Space District Lands

The Regulations for Use of Midpeninsula Regional Open Space District Lands (land-use regulations) are used by Midpen to manage its open spaces and lands responsibly and maintain the natural environment for the public. Section 805 of the land-use regulations requires Midpen to adhere to various stipulations when closing portions of its open spaces and lands, including maintaining appropriate signage. Midpen would adhere to the following restrictions on public recreation when implementing the Program (Midpen, 2014c):

Section 805. Prohibited Areas and Closures.

805.1 **Authority for Closures**. To ensure the safety and health of persons, to protect natural resources, to provide for proper planning of District Lands, to avoid interference with development, construction, and management, or to provide for security, safeguarding, and preservation of District Lands, the Board of Directors, General Manager or his/her designee or an authorized representative may declare an area, trail, road, or facility closed, prohibited, or limited to further entry by the general public.

805.2 **Types of Closures**

a) Temporary or Regular Closures. District employees may make temporary or regular closures of a portion of District Lands to the general public for public safety, or to deal with an immediate or ongoing management need. The declaration may include such reasonable classes of persons who may enter, in the conduct of authorized activities or official duties, as the General Manager or his/her designee or an authorized representative may prescribe. No person shall, without written permission issued by the District, enter or remain in an area of District Lands or facility designated as a Temporary or Regular Closure area.

b) Sensitive or Hazardous Area Closures. No person shall, without a written permit issued by the District, enter or remain in an area of District Lands or facility designated as a Sensitive or Hazardous Area, and declared closed, prohibited, or limited by the General Manager or his/her designee or an authorized agent. Sensitive areas may include those with cultural, historical or biological significance. Such designation may include, but is not limited to, specified areas of land, trails, geologic or cultural features, facilities or structures. Violation of this sub-section is punishable as a misdemeanor.

805.5 **Posting of Closures**. An area shall be considered closed when notice is posted at trailheads and gates officially designated and maintained by the District.

San Mateo County – General Plan

Midpen lands, including the ones that are a part of this Program, within San Mateo County are subject to the stipulations outlined in the San Mateo County General Plan. The following goals

and objectives regarding Parks and Recreation Resources Policies in the San Mateo County General Plan are applicable to recreational resources (San Mateo County, 2013):

6.1 **Equitable and Balanced System of Facilities**. Provide for a balanced and equitable system of park and recreation facilities. Consider identified and/or changing needs and the impact upon environmental, service, competing land use, fiscal and organizational constraints.

6.2 **Meet Recreational Need**. Meet identified relative park and recreation needs in a manner which best enhances the physical, mental and spiritual quality of life of San Mateo County residents.

Santa Clara County – General Plan

Midpen lands, including the ones that are a part of this Program, within Santa Clara County are subject to the stipulations outlined in the Santa Clara County General Plan. The Parks and Recreation Chapter of the Santa Clara County General Plan includes strategies and policies providing guidelines for recreational resources and activities within regional parks and public open-space lands (Santa Clara County, 1994). The strategies and policies that may apply to the Program are listed below:

Strategy #3 Balance Recreational and Environmental Objectives

C-PR 1 An integrated and diverse system of accessible local and regional parks, scenic roads, trails, recreation facilities, and recreation services should be provided.

C-PR 3 The County's regional park system should:

a. utilize the county's finest natural resources in meeting park and open space needs;
b. provide a balance of types of regional parks with a balanced geographical distribution;
c. provide an integrated park system with maximum continuity and a clear relationship of elements, using scenic roads, bikeways, and trails as important linkages; and
d. give structure and livability to the urban community.

C-PR 4 The public open space lands system should:

a. preserve visually and environmentally significant open space resources; and
b. provide for recreation activities compatible with the enjoyment and preservation of each site's natural resources, with trail linkages to adjacent and nearby regional park lands.

C-PR 10 Recreation facilities and activities within regional parks and public open space lands should be located and designed to be compatible with the long term sustainability of each site's natural and cultural resources, with particular

attention to the preservation of unique, rare, or endangered resources (including historic and archeological sites, plant and animal species, special geologic formations, etc.).

C-PR 16 The provision of neighborhood, community, and citywide parks and recreational facilities should be the responsibility of the cities and other appropriate agencies.

Santa Cruz County – General Plan

Midpen lands, including the ones that are a part of this Program, within Santa Cruz County are subject to the stipulations outlined in the Santa Cruz County General Plan. Chapter 7, Parks, Recreation and Public Facilities, of the Santa Cruz County General Plan contains the following policies related to the Program for scenic protection (Santa Cruz County, 1994):

7.1.3 **Parks, Recreation and Open Space Uses.** Allow low intensity uses which are compatible with the scenic values and natural setting of the county for open space lands which are not developable; and allow commercial recreation, County, State and Federal parks, preserves, and biotic research stations, local parks and passive open space uses for park lands which are developable.

7.1.8 **Sharing Parks and Recreation Facilities**. Recognize the use of existing recreational facilities owned and/or operated by other agencies including the cities, recreation districts and the school districts as serving the recreational needs of the community and partially meeting standards for community parts acreage. Cooperate in funding and sharing recreation facilities, and seek to maximize the availability of all such facilities for general public use commensurate with the needs and priorities of the other agencies through joint powers agreements addressing development, maintenance and operating programs, as allowed by budget constraints.

4.11.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on recreation would be considered significant if they exceeded the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

(See CEQA Guidelines, Appendices G, I.)

Analysis Methodology

The analysis presented in this section was performed using qualitative and comparative methods that involved identifying potential for activities to affect the recreational experience, alter the recreational outlets, and/or change the quality of the recreation experience (such as through visual changes in the landscape) resulting in the increased use of other recreational areas that could lead to deterioration or need for new recreational facilities.

4.11.5 Impact Analysis

	Significance Determination
Impact Recreation-1: Increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or necessitate construction or expansion of recreational facilities.	**Less than significant with mitigation**

Overview

Activities proposed as part of the Program would involve prescribed burning and use of equipment and vehicles that may result in trail and road closures, limiting recreational opportunities within Midpen lands to the level that recreationalists would significantly increase use of other facilities leading to deterioration. Smoke and other related safety hazards caused by prescribed burns could impact the experience of recreationalists. Various activities could alter the visual character of some areas, potentially affecting the recreational experience if the recreational experience is significantly degraded or availability of recreational areas were diminished on Midpen lands. Midpen would comply with all applicable local regulations when implementing elements of the Program that could affect recreational resources. Midpen lands traverse several counties and are subject to compliance with various local laws and ordinances concerning recreational resources, including the San Mateo, Santa Clara, and Santa Cruz County General Plans. Midpen also has specific regulations for the management of its lands, outlined its Vision Plan, Resource Management Policies, and land-use regulations. Midpen adheres to these local regulations when managing its lands that fall into those respective jurisdictions and would continue to do so when implementing the Program.

Midpen may need to close trails, roads, or other publicly accessible recreational features to implement prescribed burns or other treatments as a part of the Program and would have authority to do so under Section 805 of the land-use regulations. When closing portions of its lands, Midpen would be required to post and maintain signs to inform the public of the closures, as required by Section 805.5 of the land-use regulations.

Impacts on recreationalists from noise are addressed in Section 4.10: Noise, safety hazards are discussed in Section 4.8: Hazards, Hazardous Materials, and Wildland Fire, and changes to the visual character are analyzed in Section 4.2: Aesthetics.

Analysis of Tools and Techniques

Manual and Mechanical Techniques

Manual and mechanical methods would be implemented for several activities including creation of fuelbreaks, maintenance of defensible space, or installation of firefighting infrastructure. Fire-management activities could occur adjacent to roads and trails, particularly for the maintenance and creation of fuelbreaks. Propane flaming would be used to kill seedlings and annual plants in small areas along roads and trails. This treatment would be conducted by hand or from an ATV. Trail or road closures would not occur. Recreational use would not be impeded. Mowing and other methods of vegetation removal would occur directly in areas where recreationalists frequent, including picnic and parking areas and along roads and trails. Vegetation-management actions that employ heavy equipment or the removal of trees may require closure of specific areas during work to protect recreationalists. Temporary closures could last a few hours to a few days. Generally, only a few areas would be treated at any one time. Given the wide array of available resources across Midpen lands for recreationalists, the short-term closing of a few trails, vista points, parking areas, or service-road segments would not result in recreationalists increasing use of other parks and open spaces.

Areas that would be treated with heavy equipment as well as powered hand tools (chainsaws and brush cutters) could be visible and audible to recreationalists as the work would likely and frequently occur directly adjacent to roads and trails. Recreationalists typically pass quickly by when hiking or bicycling through these areas and view the intrusion in the natural environment as temporary. Midpen lands are day-use only, which necessarily limits the amount of time that recreationalists can use the area. The recreational experience would not be substantially diminished. Recreationalists are therefore not expected to significantly increase use of other recreational amenities.

Cut vegetation may be left in place, piled and burned, chipped, or masticated. Chipping and mastication of cut vegetative material would not require closures. Equipment use to dispose of cut vegetation would be noisy and visible, but recreationalists could move away from any disturbance. Pile burns occur throughout the winter and spring under existing conditions, but the number of pile burn events conducted could increase under the Program. Pile burns would be highly localized and occur away from high-use areas and off roads and trails. Presence of equipment and smoke from pile burning could impact recreationalists' safety and experience potentially inhibiting recreational use of Midpen lands and thereby increasing use of other recreational facilities, resulting in a potentially significant impact. Midpen requires use of warning signs or trail closure signs during operation of heavy equipment as well as a spotter to warn the equipment operator of and control visitors around equipment (MO Manual Section 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). The resulting closures would be infrequent and temporary (less than one day) in order to avoid hazards to recreationalists. Pile burning and activities associated with vegetation disposal are not anticipated to inhibit recreational use of Midpen lands in a way that could significantly increase use of other recreational areas. Impacts from use of manual and mechanical techniques on recreationalists and their use of Midpen lands would be less than significant.

Chemical Application

Chemical application currently occurs across Midpen lands in accordance with the IPMP. Herbicides would be applied by hand, either from a backpack sprayer or small applicator, or mounted on ATVs. Operation of ATVs and presence of workers on roads and trails on Midpen lands would be typical and would not alter the recreational experience. Overspray could expose recreationalists to herbicides directly or from residue on foliage adjacent to roads and trails. Implementation of the Midpen requirements for herbicide application (see Section 4.8: Hazards, Hazardous Materials, and Wildland Fire) would minimize the disturbance to recreationalists by posting signage, establishing a 5-foot no-spray buffer, or closing the area for 24 hours (MO Manual Section 17.006; IPMP BMP 35). Temporary closures of areas where chemicals would be applied, such as trail segments, would typically be small compared to the overall area available to recreationalists. Application of herbicides and possible associated closures on Midpen lands would not result in a substantial increase in recreational use at other open spaces or parks. The impact would be less than significant.

Prescribed Herbivory

Grazing currently occurs on 8,500 acres of Midpen lands. Some prescribed herbivory (e.g., goats or cattle) may occur as pre-treatment of an area to reduce some of the vegetation prior to the use of other methods. Prescribed herbivory would occur within enclosed fenced areas. These areas may be unavailable for recreational use during grazing, but typically grazing would occur in off-trail areas. Off-trail recreation is discouraged and uncommon on Midpen lands (Midpen Regulations Section 805.7). Temporary closure of off-trail areas for grazing would not affect a substantial number of recreationalists. Some prescribed herbivory may occur across larger areas (up to 10 acres), such as when using cattle, which can be conducted congruently with recreation. Trails may be closed during grazing, but due to the large quantity of recreational areas in Midpen lands available to recreationalists, increased use of open space and parks managed by other agencies would not occur. The impact would be less than significant.

Prescribed Burning

Prescribed burn events would occur for up to 5 days, with the active burn on 1 of those days, and with mop up and monitoring occurring over the rest of the days. Recreationalists could be affected by the disturbance of the fire and presence of equipment as well as by safety concerns, such as smoke inhalation, which could be significant. In accordance with MM Hazards-3, trails within at least 500 feet of the edges of a prescribed burn would be closed to the public during the burn and mop up,[1] minimizing the effects of the visual disturbance as well as potential for safety hazards.

[1] Mop up is the term used to describe the extinguishing of the fire where needed. Mop up is usually done around the perimeter of the prescribed fire to keep it contained and controlled.

Off-trail and on-trail use would be prohibited in the vicinity of a prescribed burn due to fire and smoke danger. Trail closures would occur during the burn and mop up, but different trails and roads would be affected by each prescribed burn event. As this is the case, much of the other 240 miles of trails or roads would be open for use by recreationalists during a burn and could be used by recreationalists. Closures would not affect a substantial number of recreationalists or substantially limit use of Midpen lands. At most, a few burns in total would occur across Midpen lands in any one year.

An escaped prescribed fire could damage or destroy recreational facilities and alter the recreational experience, but such occurrences are rare (Weir, Twidwell, & Wonkka, 2015; Wildland Fire Lessons Learned Center, 2013). Locations for prescribed fire within Midpen lands would be selected to minimize this risk along with adherence to the Burn Plan and Midpen requirements (RM Policies WF-1, WF-2). The aesthetics of the burn area after completion of a prescribed burn may dissuade certain recreationalists from visiting the area. These impacts would likely last for one growing season before bloom of fire-follower wildflowers and other seedlings could be anticipated in the area. Typical management practices also include cutting charred skeletons of stems and branches that could pose a hazard along roads or trails. The removed skeletons are either left on the ground, chipped, pile burned, or hauled away. Signs of prescribed burns would be temporary in a given area and, therefore, would not result in a significant change in visual quality as experienced by a large number of recreationalists. Temporary closures, in accordance with mitigation, and changes to the landscape associated with prescribed burns would not dissuade recreationalists from using the preserves. Substantially increased use of other open spaces and parks would not occur. Impacts from prescribed burning on recreationalists and facilities would be less than significant with mitigation.

Access and Vehicle Travel

Vehicles used during implementation of the Program would use trails and roads that recreationalists use, including bicyclists and hikers. All light-duty trucks and passenger vehicles would be operated according to regulated Midpen speed limits (as described in Section 4.11: Transportation). Vehicles are currently used frequently to conduct vegetation management activities. Continued use of roads and trails to access work areas with light trucks and cars under the Program would be typical and would not create an additional disturbance to recreationalists over existing conditions. Presence and travel of smaller vehicles would neither place recreationalists at risk nor alter the recreational experience.

Use and transport of heavy equipment to and from work areas could result in a hazard to hikers, bicyclists, and equestrians. Large equipment could take up the width of some fire roads during transport, leaving a recreationalist with no option but to leave the road to pass heavy equipment, which could be hazardous. Large vehicles and trucks parked on roads for access to work areas could likewise pose a hazard to recreationalists by preventing safe passage by equestrians, hikers, and bicyclists. Heavy equipment operating on or close to roads could throw up rocks, sticks, and other debris, posing a hazard to those on the nearby road. Impacts to recreationalists' safety and experience could be potentially significant. Midpen requires use of

warning signs or trail-closure signs during operation of heavy equipment as well as a spotter to warn the equipment operator of and control visitors around equipment (MO Manual Section 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). Additionally, Midpen requires vehicles to travel no more than 15 mph on unpaved, unposted roads and 5 mph when passing pedestrian, bicycles, and horses (LU Regulations Section 500.1; MO Manual 07.005). Road and trail closures, in accordance with the safety requirements, would be limited. The extent of roads or trails that could be closed at any one time would be minimal compared to the over 240 miles of roads and trails available to recreationalists across Midpen lands. Road closures may present an inconvenience but would be temporary, and other facilities would be available. With implementation of Midpen requirements, the risk to recreationalists from operation of large equipment and vehicles would be minimized, ensuring that the recreational experience is not degraded. The impacts on the recreational experience and availability of recreational areas would be less than significant.

Analysis of Plans

Vegetation Management Plan

VMAs would be maintained or created throughout Midpen lands, including adjacent to picnic tables, trails, and Midpen-owned roads that could be used by recreationalists. Activities such as mowing or pile burning would occur off the roads and trails, but directly adjacent. Generally, the vegetation management activities would not pose a danger to recreationalists as activities would be located off roads and trails, where recreationalists do not typically traverse. Heavy equipment and large vehicles accessing the work areas, as well as smoke from pile burning, could pose a threat to recreationalists and dissuade them from recreating in the area. The effect on the recreational experience could be significant. Midpen requires use of warning signs or trail closure signs during operation of heavy equipment as well as a spotter to warn the equipment operator of and control visitors around equipment (MO Manual Section 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). The areas of closures would be limited and temporary compared to the overall areas within Midpen lands available to recreationalists. Displaced recreation would be minimal. The treatments would result in visual changes to the landscape during and after for several months but not to a degree that the recreational experience would be diminished. Impacts from vegetation management activities on recreationalists would be less than significant.

Prescribed Fire Plan

Prescribed burns would be conducted on Midpen lands. Up to three prescribed burns could be conducted in any one year. Heavy equipment and large vehicles may be used for pre-treatment, during the burn, and during mop-up activities. Travel to sites with and presence of heavy equipment, smoke from the burn, and the potential for escape of the burn could pose a hazard to recreationalists, affecting the recreational experience. The impact could be significant. Midpen requires use of warning signs or trail closure signs during operation of heavy equipment as well as a spotter to warn the equipment operator of and control visitors around equipment (MO Manual Section 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). MM Hazards-3 requires that all trails and internal Midpen-owned or managed roads within at

least 500 feet of the outer edges of the prescribed burn area be closed to recreationalists. Where prescribed burning occurs, trails in proximity to the burns may be temporarily closed, but closures would be limited compared to the miles of trails and roads available for recreating across Midpen lands. With mitigation, the impact would be less than significant.

Wildland Fire Pre-Plan

Installation and construction of firefighting infrastructure would involve use of vehicles and equipment for ground-disturbing activities potentially affecting the recreational experience. The visual changes to and equipment along roads and trails could pose a hazard, which may result in a significant impact. Midpen requires use of warning signs or trail closure signs during operation of heavy equipment as well as a spotter to warn the equipment operator of and control visitors around equipment (MO Manual Section 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). Trail and road closures would occur in small areas compared to the overall miles and area of recreating available within Midpen lands. The impact would be less than significant.

4.11.6 Mitigation Measures

MM Hazards-3: Safety Around Prescribed Burns
Refer to Section 4.8: Hazards, Hazardous Materials, and Wildland Fire

4.12 Transportation

4.12.1 Introduction

This section provides a description of the transportation and traffic within the Program area and a discussion of potential impacts to transportation as a result of Program implementation.

One comment related to transportation and traffic was received during the public scoping period. A summary of the comment and the location where it is addressed in the transportation and traffic analysis is provided in Table 4.12-1.

Table 4.12-1 Transportation and Traffic Scoping Comments

Summary of Comment	Location Addressed
The EIR should highlight the need to ensure safe passage during a wildland fire for all vehicles that pass through or adjacent to Midpen properties.	Section 4.12.5: Impact Analysis

4.12.2 Existing Environment

Road Network

Major roadways that provide access to Midpen lands include SR-9, SR-17, SR-35, SR-84, and SR-92 as well as I-280. SR-35, also known as Skyline Boulevard, runs adjacent to 15 of the 26 OSPs, serving as a key gateway to the area.

The San Mateo City/County Association of Governments (C/CAG) is the designated Congestion Management Agency for San Mateo County while the Valley Transit Authority (VTA) is the designated Congestion Management Agency for Santa Clara County. Each agency is responsible for developing and updating the Congestion Management Program (CMP) in its respective jurisdiction. The San Mateo County CMP identifies I-280, SR-1, SR-35, SR-84, and SR-92 as CMP roadways while the VTA's CMP contains a more extensive list of CMP roadways, including SR-17 and SR-35, which pass adjacent to Midpen lands.

Most publicly accessible County and local roads lead to parking lots where the public can access Midpen's extensive network of hiking, bicycling, and equestrian trails (Table 4.12-2). Local access roads, such as Skyline Boulevard, to the majority of OSPs veer off of main highway routes, except for Saratoga Gap OSP (accessed directly from Skyline Boulevard or Highway 9). Miramontes Ridge OSP is closed to the public and does not have publicly accessible local roads.

Public parking is available at all of the OSPs except Miramontes Ridge, Teague Hill, and Tunitas Creek OSPs. The use of private motorized vehicles is not permitted on the OSPs except in parking lots and on access roads leading to them.

Table 4.12-2 Local Access Roads Adjacent to Midpen Lands

Managed Land	Local Access Roads
Bear Creek Redwoods OSP	Bear Creek Road
Coal Creek OSP	Skyline Boulevard Page Mill Road
El Corte de Madera Creek OSP	Star Hill Road Skyline Boulevard Native Sons Road Bear Gulch Road
El Sereno OSP	Montevina Road
Felton Station (Closed to the public)	Black Rock
Foothills OSP	Page Mill Road
Fremont Older OSP	Prospect Road
La Honda Creek OSP	Sears Ranch Road Allen Road
Long Ridge OSP	Portola Heights Road Portola Heights Road
Los Trancos OSP	Page Mill Road
Miramontes Ridge OSP (Closed to the public)	San Mateo Road Skyline Boulevard
Monte Bello OSP	Page Mill Road
Picchetti Ranch OSP	Montebello Road
Pulgas Ridge OSP	Edmonds Road
Purisima Creek Redwoods OSP	Edmonds Road
Rancho San Antonio OSP	Cristo Rey Drive
Rancho San Antonio County Park	Cristo Rey Drive
Ravenswood OSP	Bay Road
Russian Ridge OSP	Page Mill Road Alpine Road
Saratoga Gap OSP	Skyline Boulevard Highway 9
Sierra Azul OSP and Easements	Alma Bridge Road
Skyline Ridge OSP	Edmonds Road

Managed Land	Local Access Roads
St. Joseph's Hill OSP	Alma Bridge Road
Stevens Creek Shoreline Nature Study Area	Shoreline Boulevard
Teague Hill OSP	Kings Mountain Road
Thornewood OSP	La Honda Road
Tunitas Creek OSP (Closed to the public)	Tunitas Creek Road
Windy Hill OSP	Portola Road

Source: (Midpen, 2020)

Transit and Bicycle Facilities

The San Mateo County Transit Authority, Santa Clara VTA, and Santa Cruz Metro Transit District operate public bus and rail service within the region. For the most part, there is no direct transit service to any of Midpen lands. Some OSPs are accessible by bus service. Line 295 ends at Cordilleras Center, adjacent to Pulgas Ridge OSP. Some weekday bus lines travel adjacent to several OSPs, but only for school service. No designated bikeways provide access to the OSPs; however, some unpaved trails and roads usable by bicycles provide access. The OSPs offer over 240 miles of hiking, bicycling, and equestrian trails for use by the general public (see Section 4.11: Recreation for more information).

4.12.3 Regulatory Setting

Federal and State

No federal or State programs or policies addressing transportation pertain to the analysis of transportation and traffic impacts for the Program.

Local

Midpeninsula Regional Open Space District – Vision Plan

Midpen prepared the Vision Plan to articulate the core values for conservation and management of open space over the next 40 years or more. The themes and goals were developed based on Midpen's mission statement and adopted policies (Midpen, 2014a). Midpen uses the Vision Plan to guide management decisions related to the lands and open spaces that would be a part of this Program. The following public access goal pertains to the transportation within Midpen lands:

Expand Appropriate Access:

- Provide new public access or improve access to inaccessible areas with trails and staging area improvements.
- Increase access close to where more people live and provide access that minimizes the use of cars.
- Provide regional, long-distance trails that connect open space to communities.

Midpeninsula Regional Open Space District – Regulations for Use of Midpeninsula Regional Open Space District Lands

The Regulations for Use of Midpeninsula Regional Open Space District Lands (land-use regulations) are used by Midpen to manage its open spaces and lands responsibly and maintain the natural environment for the public. The following vehicle and transportation regulations would apply to Midpen employees and contractors operating vehicles as a part of the Program (Midpen, 2014b):

Section 801. Parking.

801.1 Restrictions. No person shall park a motor vehicle, except an authorized emergency vehicle, or when in compliance with the directions of a peace officer, ranger, or District employee, in any of the following places:

a) In areas where prohibited by "NO PARKING," or other posted signs;

b) On or obstructing any fire road or fire lane;

c) On or obstructing any trail;

d) In such a place or manner as would block or obstruct any gate, entrance, or exit;

e) In such a place or manner as to take up more than one marked parking space in any authorized parking area;

f) In such a place or manner as to block or obstruct the free flow of traffic or to obstruct the ability to remove a parked vehicle;

g) Within 15 feet of a fire hydrant;

h) Adjacent to any curb painted red;

i) On any District Lands after Official Hours as defined in Section 805.3 except pursuant to a written permit;

j) In areas signed for permit parking on District Lands without a written permit;

k) In any space designated for disabled parking in an unpaved parking lot, except when displaying a disabled placard as defined in California Vehicle Code; or

l) In any other place on District Lands not designated by the District as an authorized area.

Section 803. Speed Limits.

803.1 **General**. No person shall drive or operate a vehicle, motor vehicle, or bicycle on District Lands at a speed greater than the posted speed limit, or as otherwise specified in any District Ordinance, rule or regulation. No person shall drive or operate a vehicle or motor vehicle, ride a horse, or ride a bicycle at a speed greater than reasonable given weather, visibility, traffic, presence of other users, surface and width of the trail or road, or which may damage natural or cultural resources or wildlife.

Santa Clara County – General Plan

Midpen lands, including the ones that are a part of this Program, within Santa Clara County are subject to the stipulations outlined in the Santa Clara County General Plan. The Transportation Chapter of the Santa Clara County General Plan includes strategies and policies providing guidelines for transportation and traffic within regional parks and public open space lands (Santa Clara County, 1994). The strategies and policies that may apply to the Program are listed below:

Strategy #4: Assure the Maintenance and Safety of Rural Roads

R-TR 9 Rural roads should be designed and built to standards that will assure driving safety and provide access for emergency vehicles.

R-PR 32 Trails shall be temporarily closed when conditions become unsafe or environmental resources are severely impacted. Such conditions could include soil erosion, flooding, fire hazard, environmental damage, or failure to follow the specific trail management plan (see Countywide Trails Master Plan - Design and Management Guidelines).

R-PR 33 Use of motorized vehicles on trails shall be prohibited, except for wheelchairs, maintenance, and emergency vehicles.

R-PR 35.4 Public improvement projects, such as road widenings, bridge construction, and flood control projects, that may impact existing or proposed trails should be designed to facilitate provision of shared use.

4.12.4 Impact Assessment Methodology

Significance Criteria

The impacts of the Program on transportation would be considered significant if they would exceed the following standards of significance, in accordance with Appendix G of the CEQA Guidelines:

- Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities;
- Conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b);

- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

(See CEQA Guidelines, Appendix G, I.)

Significance Thresholds

In accordance with the Technical Advisory on Evaluating Transportation Impacts in CEQA, PRC § 21099 states that the criteria for determining the significance of transportation impacts must promote (1) reduction of GHG emissions; (2) development of multimodal transportation networks; and (3) a diversity of land uses. The Office of Planning and Research identifies a screening threshold for a small land-use project as a project that generates or attracts fewer than 110 trips per day. Projects that generate fewer than this threshold may be assumed to cause a less-than-significant transportation impact (OPR, 2017).

No thresholds have been adopted by Midpen or the state for vehicle miles traveled (VMT) related to a fire and fuel management plans. Although a fire management plan is not a land use project, it is assumed that the screening threshold would still apply to the Program. Worker trips associated with the Program activities would occur consistently throughout each year of Program implementation, similar to operation of a small land-use project.

Analysis Methodology

The evaluation of traffic impacts is focused on VMT, traffic hazards, and emergency access. VMT is quantitatively determined and compared against the screening threshold. A qualitative analysis is presented that evaluates the conflict safety hazards and the emergency access issues that could arise from the various tools and techniques that could be used under the Program to implement each management action. The analysis is based on knowledge of the types of roads in and around Midpen lands and the potential for traffic safety conflicts based on the existing traffic and road conditions, such as, but not limited to substrate, topography, width of road, and state of repair.

4.12.5 Impact Analysis

Impact Transportation-1: Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) or conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, or bicycle and pedestrian facilities.	**Significance Determination**
	Less than significant with mitigation

Overview

Roads and intersections would not be modified or redesigned or require maintenance as a part of the Program. No changes to the use of existing roadways would occur and this concern is not discussed further. Program activities have the potential to occur adjacent to public roads, which could increase traffic hazards or pose an incompatible use due to presence of workers and heavy equipment, as analyzed below.

The Program would comply with all local regulations pertaining to transportation. Midpen's land-use regulations outline speed limits and parking restrictions that Midpen employees and contractors would adhere to when operating vehicles for the Program. The Santa Cruz General Plan Strategy #4 requires rural roads to be maintained for driving safety. Access roads would be built and improved upon throughout Midpen lands as a part of the Program and would comply with Strategy #4 of the Santa Cruz General Plan.

Heavy equipment and vehicles may use roads and trails to access Midpen open spaces and lands, which may alter the routes accessible to the public, diminishing recreational opportunities. Impacts on recreationalists are addressed in Section 4.11: Recreation.

Analysis of Tools and Techniques

Manual and Mechanical Techniques

Manual and mechanical techniques are currently implemented on Midpen lands. Propane flaming would generally be conducted in small areas, typically for maintenance of newly created VMAs to address broom infestations and other non-native seedlings and would not require public road closures. Pile burns are currently performed in areas set back from roads so as not to pose a hazard to roadway users including motorists and bicyclists, most typically in more remote areas where it is difficult to use a tracked chipper for biomass disposal. No new impacts from incompatible uses with the public on roadways would occur due to pile burning. Safety for workers and the general public would not be a concern when working along roads (e.g., trails and Midpen-owned or managed roads) closed to public vehicles, as recreationalists on foot, bike, or even horse do not present a significant hazard. When working on easements or other Midpen land that is closed to public vehicles, Midpen or other private entity vehicles could be operating in or pass through a work area. Activities proposed under the Program that could create a hazardous situation for crews working near roadways include mowing on public or private road shoulders. Use of heavy equipment operating on road shoulders has the potential to kick up rocks and debris that may be hazardous to motorists and bicyclists. When working adjacent to public roads, Midpen adheres to the California Manual on Uniform Traffic Control Devices (MUTCD) as well as Midpen BMPs to minimize risk to motorists and workers. The MUTCD requires the utilization of warning signs to alert motorists and other roadways users to the presence of roadside workers as well as flaggers to direct flow. The MUTCD also requires crew to wear safety equipment, such as high-visibility vests, when operating vehicles or equipment near public roads. Midpen requires use of spotters and warning signs, when operating heavy equipment and tractors in highly traveled or visited areas, which would include along public roadways (MO Manual 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). Safety vests and signage, as appropriate, make crew members more visible on road shoulders and reduce the hazard to workers of working on the road shoulder as well as to motorists and bicyclists that need to safely traverse the work area. Chippers and other equipment may need to be staged on public roads to remove materials from fuelbreak work. Any lane or road closures would also require encroachment permits from the local jurisdiction within which the road is located or Caltrans for State routes and highways. The encroachment permits would also include stipulations to ensure public and worker safety, minimizing

impacts. Impacts on workers working along or near roadways and motorists or bicyclists on public roads would be less than significant.

Chemical Application
Herbicides would be applied by hand or from an ATV. Broadcast spraying would not occur. Operation of ATVs and presence of workers on roads and trails would be typical of activities currently conducted on Midpen lands and would not generally be conducted along public roads. Compliance with the MUTCD requirements, including use of high-visibility vests and warning signage, where appropriate and when operating vehicles or equipment near public roads, would ensure that any roadside spraying would not increase hazards for motor vehicles on roads or workers from vehicle traffic. The presence of workers and ATVs during chemical application, would not increase hazards or conflict on roads or trails since only a few would be used and the roads and trails typically have a low level of use. The impact would be less than significant.

Prescribed Herbivory
Treatment of an area through prescribed herbivory would require erecting temporary fencing to contain livestock where natural barriers are not present. Temporary fencing, where needed, would not be erected to block public or Midpen-owned or managed roadways, but would be designed to ensure livestock are blocked from entering public roads. No impact would occur.

Prescribed Burning
In the event a prescribed burn is conducted near a roadway, smoke from the burn could obscure motorist or bicyclist vision, or an escaped burn could pose a hazard to motorists or bicyclists if they were to pass near to the burn. Staged equipment along the roads would limit motorist maneuverability and could pose a distraction. Workers attending to a prescribed burn near a roadway could be at risk from passing motorists. The impact could be significant. The MUTCD and Midpen policies requires crew to wear safety equipment, signage, and/or spotters when operating vehicles or equipment near public roads (MO Manual 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16) increasing visibility on road shoulders and reducing the hazard of working on the road shoulder.

Prescribed burns could require up to 100 crew members, including fire trucks/water tenders and other equipment during the burn day. While this equipment would temporarily generate more traffic, it would be only on the day of the burn. Fewer vehicles and trucks would be needed to conduct pre-treatment or remain to conduct mop-up activities. Only a few burns are anticipated in any one year. Public roads would generally not need to be closed, particularly major roadways such as Skyline Boulevard or Bear Creek Road. Effects from a prescribed fire (e.g., staging of equipment, smoke) could significantly impact traffic or pose a traffic hazard on public and private roads. A Traffic Control Plan would be developed and implemented to ensure the safety of drivers on public roads, in accordance with MM Hazards-3. MM Hazards-3 would further reduce impacts by requiring that all trails and internal Midpen-owned or managed roads within at least 500 feet of the outer edges of the prescribed burn area be closed

to unaffiliated private vehicles (e.g., County or private landowner vehicles on Midpen managed but not owned land). Impacts would be less than significant with mitigation.

Any lane or road closures, in the rare event they are required for a prescribed fire, would also require encroachment permits from the local jurisdiction within which the road is located or Caltrans for State routes and highways. The encroachment permits would also include stipulations to ensure public and worker safety, minimizing safety impacts.

Access and Vehicle Travel

Crew and equipment would be transported to work sites within Midpen lands. Crew sizes would likely be around two to 15 crew members per activity for most activities. Midpen currently conducts vegetation management using similar crew sizes under existing conditions. Prescribed burning is a much larger operation and could require up to 100 crew members. Transport of work crews in vans or trucks would not increase hazards on roadways. The types of vehicles used (passenger vehicles and vans) and low volumes can be accommodated easily on the existing public roads around Midpen lands.

Travel and use of large vehicles as well as transport of heavy equipment on public roadways could result in a hazard to bicyclists and other motorists due to the size of heavy equipment and large vehicles. Motorists on public roads may be traveling at higher speeds than vehicles and heavy equipment (e.g., backhoes) traveling to work sites. Slow vehicles and equipment on public roads would use flagging and signage in accordance with MUTCD and Midpen requirements (MO Manual 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). Hazards could increase for access to areas that are not typically accessed by heavy equipment where road conditions may be compromised.

Vehicles traveling too fast on unpaved roads in poor condition could result in an accident and injury of a crew member. For example, Allen Road and Bear Gulch Road are unpaved access routes that cross through El Corte Madera Creek OSP and La Honda Creek OSP. Midpen employees and contractors may need to access these roads when constructing 200-foot fuelbreaks within each respective preserve. These roads, and other similar roads throughout Midpen lands, would be evaluated and repaired prior to use to ensure stability and that the surfaces have dried out enough to support vehicles without causing further damage to the roads or a hazard to the vehicles. Additionally, Midpen requires vehicles to travel no more than 15 mph on unpaved, unposted roads (LU Regulations Section 500.1; MO Manual 07.005). This provision would ensure that vehicle and equipment travel would not result in a safety hazard. The impact would be less than significant.

Analysis of Plans

Vegetation Management Plan

New VMAs would be created and maintained and continued maintenance of existing fuelbreaks and defensible spaces would occur under the VMP. Heavy equipment would be transported to work areas to create or maintain VMAs, resulting in potential hazards due to incompatible uses. Travel and use of large vehicles as well as transport of heavy equipment on

public roadways, could present a hazard to motorists or bicyclists from incompatible uses. Workers and equipment working close to public roads may pose a hazard to motorists or bicyclists traveling along the roadways or workers. The MUTCD requires crew to wear safety equipment, such as high-visibility vests, when operating vehicles or equipment near public roads. Slow vehicles and equipment on public roads would use flagging, spotters, and/or signage in accordance with MUTCD and Midpen policies (MO Manual 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). These provisions would protect workers from hazards associated with working near and along public roads. Workers conducting activities along Midpen-owned or managed roads and trails would not experience a hazard risk from working near roads since no other motorists except authorized vehicles, are allowed on the roads. Per Midpen policy, vehicles on unpaved, unposted roads must travel no more than 15 mph. These requirements would ensure that vehicle and equipment travel, and operation associated with VMA creation and maintenance, would not result in a safety hazard. The impact would be less than significant.

Prescribed Fire Plan

Pre-treatment activities to create or maintain control lines and prescribed burns would involve use of heavy equipment and vehicles. For prescribed burns conducted away from public roads, per Midpen policy, vehicles on unpaved, unposted roads must travel no more than 15 mph (LU Regulations Section 500.1; MO Manual 07.005). Where prescribed burns are conducted along or near a public road, presence of equipment, workers, and the burn could pose a hazard to motorists or bicyclists. Compliance with MUTCD and Midpen policies (MO Manual 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16) requires use of safety equipment for workers and signage on slow vehicles. The hazard from smoke obscuring visibility to motorists or bicyclists and fire near a road could remain, resulting in a significant impact. In accordance with MM Hazards-3, private roads would be closed within 500 feet of the burn to all unaffiliated traffic (e.g., other private vehicles) and public roads would be temporarily closed only if needed; otherwise, a Traffic Control Plan would be developed and implemented to ensure the safety of drivers. With mitigation, the impact on roadways users and workers would be reduced to less than significant.

Wildland Fire Pre-Plan

Firefighting infrastructure would be installed or constructed adjacent to trails, Midpen-owned or managed roads, or public roads. Heavy equipment and vehicles would need to travel along roadways to reach the work areas. Per Midpen policy, vehicles on unpaved, unposted roads must travel no more than 15 mph (LU Regulations Section 500.1; MO Manual 07.005). Generally, the infrastructure would be located within Midpen land, away from public roads, minimizing the potential for conflict with motorists and bicyclists or risk to workers during construction. Impacts on traffic would be typical of small construction projects. Signage would be used for slow vehicles transporting heavy equipment and traveling along public roads, in accordance with the MUTCD and Midpen policies (MO Manual 08.016; Safety Manual Sections 1.6.5.15 and 1.6.5.16). Appropriate safety equipment and flagging, per the MUTCD, would be used for workers and equipment constructing infrastructure adjacent to public roads. The hazard to

motorists or bicyclists traveling along the roadways or workers would be minimized with compliance with existing requirements. The impact would be less than significant.

	Significance Determination
Impact Transportation-2: Conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	**Less than significant**

The annual average number of workers proposed under the Program would increase from approximately five workers per day under existing conditions to 30 workers a day, with up to a maximum of 100 workers per day during a prescribed burn. Average daily one-way worker vehicle trips throughout the year would increase from approximately six trips to 60 trips (or less). The net new average number of daily one-way vehicle trips associated with the Program could increase nominally but would not exceed screening threshold of 110 trips per day. The VMT associated with implementation of the Program would not conflict with State CEQA Guidelines section 15064.3, subdivision (b). The impact would be less than significant.

	Significance Determination
Impact Transportation-3: Inadequate emergency access.	**Less than significant**

Fuelbreaks adjacent to identified evacuation routes and designated Wildland Type 3 routes would be created and maintained as a part of the Program, allowing for safer and more efficient emergency access. Firefighting infrastructure, including access roads and staging locations, would be improved upon and potentially created in areas where adequate access is lacking. New spur roads and improvements on existing access roads would allow for faster and more efficient emergency access. Additional staging/fire management locations and landing areas would allow emergency vehicles and helicopters access to more remote portions of OSPs.

Several of the methods and activities proposed as part of the Program, including prescribed burning and mowing, could require lane or full road and trail closures that could slow or prevent emergency access into or through Midpen lands. Restricting emergency access could result in a significant impact. MM Transportation-1 requires Midpen to implement provisions to allow access for emergency responders across or through any work site. The measure requires that flaggers equipped with two-way radios, if necessary, inform the crew to cease operations and reopen the road to emergency vehicles. Minimal delays, lasting a few minutes, would occur while crews reposition equipment and vehicles to ensure adequate room for emergency vehicles to pass. Applicable emergency response agencies and agencies with jurisdiction must be given prior notification of temporary closures on public roadways at least one week in advance. The mitigation would also ensure that unattended vehicles and equipment used for a particular activity are not parked in such a way that blocks the road. In the event of an emergency, mitigation would ensure that emergency vehicles are provided access, resulting in a less than significant impact.

4.12.6 Mitigation Measures

MM Transportation-1: Emergency Responders and Access

The following measures shall be implemented to ensure emergency access is maintained:

1. At least one week prior to temporary lane or full closure of a public road, Midpen shall contact the appropriate emergency response agency/agencies with jurisdiction (e.g., CalTrans, County, City) to ensure that each agency is notified of the closure and any temporary detours in advance.
2. In the event of an emergency, roads (public roads, and Midpen-owned or managed roads) or access trails blocked or obstructed by activities shall be cleared to allow emergency vehicles to pass.
3. During temporary lane or road closures on public roads, Midpen shall use flaggers equipped with two-way radios. During an emergency, flaggers shall radio to the crew to cease operations and reopen the public road to emergency vehicles.
4. In work areas, all vehicles and equipment shall be parked so the road is not blocked or obstructed when there is no operator present to move the vehicle.

Applicable Location(s): All locations where roads or access trails may be blocked to perform activities.

Performance Standards and Timing:

- **Before Activity:** Inform emergency responders of public road closures.
- **During Activity:** (1) Ensure flaggers and crew are equipped with two-way radios on public roads, (2) clear roads and access trails in the event of an emergency, and (3) park vehicles and equipment so as not to obstruct the roadway.
- **After Activity:** N/A

MM Hazards-3: Safety Around Prescribed Burns

Refer to Section 4.8: Hazards, Hazardous Materials, and Wildland Fire

5 Other CEQA Considerations

5.1 Cumulative Impacts

5.1.1 Overview

This section provides a discussion of the potential cumulative and growth-inducing impacts associated with the Program, as required by CEQA. Cumulative impacts are defined as two or more individual effects that, when considered together, are considerable, or that compound or increase other environmental effects. Section 15130(a) of the CEQA Guidelines states:

> An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable…. Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

The discussion of cumulative impacts must reflect the severity of the impacts and the likelihood of their occurrence; however, the discussion need not be as detailed as the discussion of project-specific impacts (CEQA Guidelines section 15130(b)). The cumulative impact analysis for this Program EIR evaluates the potential cumulative impacts from the Program in combination with other past, present, and probable future projects in or near Midpen lands.

5.1.2 Approach to Analysis

CEQA Guidelines section 15130(b) presents two approaches for identifying the relevant cumulative projects to include in the cumulative analysis in an EIR:

- A list of past, present, and probable future projects producing related or cumulative impacts, including those projects outside the control of the lead agency; or
- A summary of projections contained in an adopted local, regional, or Statewide plan, or related planning document that describes or evaluates conditions contributing to the cumulative effect.

This Program EIR utilizes a hybrid approach: a list of past, present, and probable future projects (collectively referred to as “cumulative projects”) is considered in combination with baseline conditions, agency projections, and adopted planning documents. The cumulative analysis considers, but does not exclusively rely on, planning documents to establish the cumulative scenario for the analysis.

The discussion of cumulative impacts in this Program EIR focuses on whether the incremental impacts of the Program are cumulatively considerable when considering other, nearby projects. A cumulatively considerable impact means that the incremental impacts of an individual project are significant when viewed in context with the effects of past, present, and probable future projects (CEQA Guidelines section 15065(a)(3)). The discussion of cumulative impacts in this Program EIR follows these guidelines:

1. **Define the Relevant Geographical Area of Impact.**
   The relevant area affected for each impact category is defined, with a reasonable explanation supporting the geographic area used in the analysis. (CEQA Guidelines section 15130(b)(3).
2. **Identify the Past, Present and Probable Future Projects Producing Related or Cumulative Impacts.**
   If a "list approach" is used, past, present, and probable future projects for each impact category are identified. All projects that might result in related impacts, not just similar sources or projects, are included. (CEQA Guidelines section 15130(b)(1).
3. **Is There a Significant Impact to which Both the Program and Other Projects Contribute?**
   The combined effects of both the Program and the other identified projects that could result in an impact that is cumulatively significant are identified (*Communities for a Better Environment v. California Resources Agency* [2002] 103 Cal.App.4th 98, 120). This question has two parts: (1) is there a significant impact on the environment that (2) is the result of the effects of the Program combined with the effects of other projects? If the Program does not contribute to the impact, or the impact is not significant, then it is not considered a significant cumulative impact. Mitigation is not considered at this point in the analysis.
4. **Is the Program's Incremental Contribution Cumulatively Considerable?**
   If the answer to question number 3 above is "no," then the impact is discussed briefly, with the basis for the determination set forth. If the answer to question number 3 above is yes, then the Program's incremental effect is assessed to determine if it is cumulatively considerable without mitigation. Even where the Program might cause an "individually limited" or "individually minor" incremental impact that, by itself, is not significant, the Program may nevertheless contribute to a cumulative impact if the contribution is "cumulatively considerable" when viewed together with environmental changes anticipated from past, present, and probable future projects (CEQA Guidelines sections 15064(h)(1), 15355(b).
5. **Would Mitigation Reduce the Program's Cumulatively Considerable Contribution to a Less Than Significant Level?**
   If the Program contributes to a significant cumulative impact (question number 3, above) and if the Program's contribution is cumulatively considerable (question number 4, above), then the final question is whether mitigation would reduce the

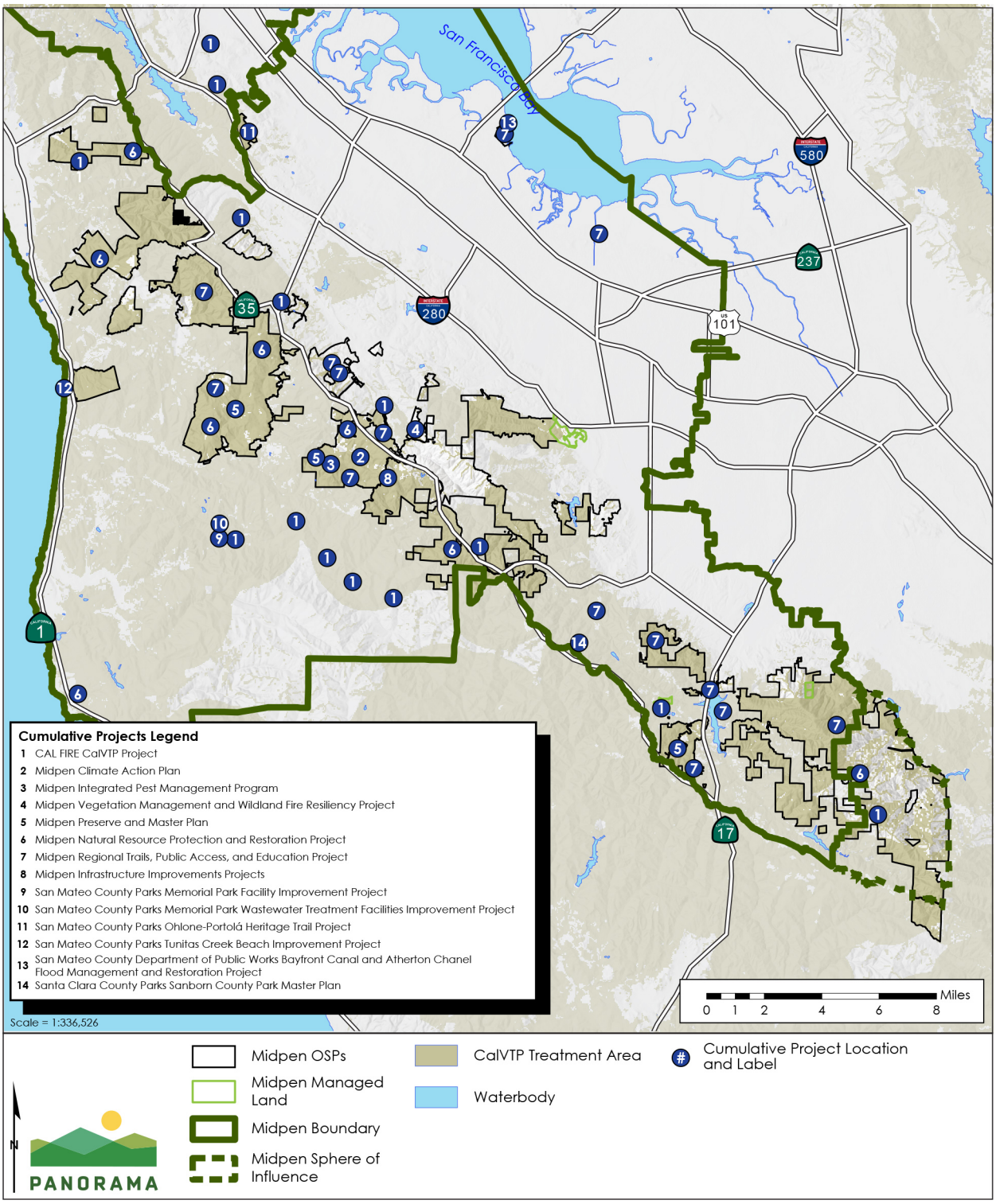
Program's contribution to a less than cumulatively considerable level. Even though mitigation may render the Program's contribution less than significant when viewed in isolation (i.e., at a project-specific level), the contribution that remains after mitigation may still be cumulatively considerable and, thus, not mitigated for cumulative impact analysis purposes. If the Program's contribution is mitigated to a less than cumulatively considerable level, then the impact can be found to be less than significant.

6. **What is the Significance of the Program's Contribution to the Cumulative Impact?**
   The significance of the Program's contribution to the cumulative impact is stated as either: (1) less than significant (i.e., less than cumulatively considerable); (2) less than significant with mitigation (i.e., the cumulatively considerable contribution has been eliminated or rendered so small that it is no longer cumulatively considerable); (3) significant and unavoidable.

5.1.3 Projects with Potentially Related or Cumulative Impacts

A total of 13 projects or programs are located within the environmental geographic extents specified for each environmental resource topic covered under the Program that could have some potential to lead to cumulative impacts. A map locating the Program in relation to the related projects, plans, and programs is shown in Figure 5.1-1. Table 5.1-1 provides a brief discussion of each project, plan, or program, including schedule, where available.

Figure 5.1-1 Location of Cumulative Projects Within and Surrounding Midpen Lands



Source: (USGS, 2013; USGS, 2016; Tele Atlas North America, Inc., 2018; Midpen, 2019; Midpen, 2014)

Table 5.1-1 Cumulative Projects

ID	Project	Description	Schedule
		CAL FIRE	
1	California Vegetation Treatment Program	The program involves the expansion of CAL FIRE's vegetation treatment activities to reach a total treatment acreage target of approximately 250,000 acres per year. Treatments types include fuelbreaks, WUI fuel reduction, and ecological restoration implemented through prescribed burning, manual and mechanical methods, prescribed herbivory, and herbicides. CalVTP also addresses a project-specific implementation approach for streamlining CEQA review of later site-specific vegetation treatment projects consistent with the program.	The Final EIR was approved in December 2019 and implementation is ongoing.
		Midpeninsula Regional Open Space District	
2	Climate Action Plan	The Climate Action Plan is a roadmap to achieve Midpen's ambitious, voluntary climate change goal of reducing operational greenhouse gas emissions 20 percent by 2022, 40 percent by 2030, and 80 percent by 2050. Actions implemented under the Climate Action Plan include greener commuting behavior by employees (taking public transit, carpooling, biking and flexible work schedules), purchasing 100 percent renewable energy from Silicon Valley Clean Energy and Peninsula Clean Energy, transitioning diesel fleet vehicles and equipment to plant-based renewable electric and alternative fuel, and purchasing carbon offsets for business flights.	Actions began implementation in 2018 and will continue to be rolled out through 2050.
3	Integrated Pest Management Program	The IPMP directs management of all pests on Midpen properties with a focus on vegetation management program in wildlands; however, it also includes some rodent and insect pest management strategies at Midpen-owned structures. The IPMP involves use of non-chemical methods including manual and mechanical removal as well as chemical methods, such as pesticides, herbicides, and insecticides.	The IPMP includes up to 136 acres of manual and mechanical treatments. Implementation is ongoing since 2014 with allowable escalation of 1 percent annually for the IPMP.
4	Forest Management Projects	Midpen utilizes various programs and plans to implement specific forest management projects on its lands. These programs and plans include: • Los Trancos–Page Mill Eucalyptus Removal • Restoration Forestry Demonstration Project	Projects are in the early phases of planning or implementation.

ID	Project	Description	Schedule
5	Preserve and Master Plans	Midpen has prepared long-term use and management plans for specific OSPs and Midpen-wide plans. Stewardship actions including habitat restoration, protection of open space resources, and improvement of trails and public facilities. The Master Plans include: • Bear Creek Redwoods Preserve Plan • La Honda Creek Master Plan • Mindego Ranch Use and Management Plan	Implementation is ongoing.
6	Natural Resource Protection and Restoration Projects	Midpen implements numerous projects to restore and enhance open space land, which includes forests, streams, watersheds and coastal ranch areas throughout Midpen lands. Many of the following projects were identified as key project portfolios in Midpen's Vision Plan: • Mount Umunhum Environmental Restoration and Public Access Project • Miramontes Ridge: Gateway to the San Mateo Coast Public Access, Stream Restoration, and Agriculture Enhancement Projects • Purisima Creek Redwoods: Purisima-to-Sea Trail Completion, Watershed Protection, and Conservation Grazing Projects • La Honda Creek: Upper Area Recreation, Habitat Restoration, and Conservation Grazing Projects • La Honda Creek: Driscoll Ranch Area Public Access, Endangered Wildlife Protection, and Conservation Grazing Projects • Russian Ridge: Public Recreation, Grazing, and Wildlife Protection Projects • Cloverdale Ranch: Wildlife Protection, Grazing, and Trail Connections • Regional: Redwood Protection and Salmon Fishery Conservation • Long Ridge: Trail, Conservation, and Habitat Restoration Projects • Various additional small creek, pond, and tree restoration projects	Construction of the Mount Umunhum Environmental Restoration and Public Access Project is complete; habitat restoration, invasive species treatment, and monitoring is ongoing. Many additional Natural Resource Protection and Restoration Projects are included in Midpen's priority Vision Plan Actions and are in the early phases of planning and review.
7	Regional Trails, Public Access, and Education Projects	Midpen is currently working on a Regional Trails layer and a Master Planned layer of trails in GIS. There is little information on specific future planned regional trail projects and their implementation/construction dates. Many public access improvement projects are also implemented throughout Midpen lands. Midpen has identified the following regional trail	Several trails projects are currently under construction (Ravenswood Bay Trail Project) or under Board review (Beatty Parking Area and Trail Connections Project, Hawthorns Public

ID	Project	Description	Schedule
		and public access projects, some of which were identified as key project portfolios in Midpen's Vision Plan: • Coal Creek: Reopen Alpine Road for Trail Use • Beatty Parking Area and Trail Connections Project • Bear Creek Redwoods: Public Recreation and Facilities Projects • Highway 17 Wildlife and Regional Trail Crossings • Ravenswood Bay Trail Project • El Corte de Madera Creek: Bike Trail and Water Quality Projects • El Sereno: Dog Trails and Connections • Windy Hill: Trail Improvements and Preservation • Hawthorns Public Access Project • La Honda Creek/Russian Ridge: Preservation of Upper San Gregorio Watershed and Ridge Trail Completion • Peninsula and South Bay Cities: Partner to Complete Middle Stevens Creek Trail • Develop trails between Butano State Park, Pescadero Creek County Park, and Russian Ridge OSP, and between Skyline Ridge OSP, Portola Redwoods State Park, and Big Basin State Park • Regional: Complete Upper Stevens Creek Trail • South Bay Foothills: Saratoga-to-Sea Trail and Wildlife Corridor • Sierra Azul: Cathedral Oaks Public Access and Conservation Projects • Sierra Azul: Rancho de Guadalupe Family Recreation and Interpretive Projects • Sierra Azul: Loma Prieta Area Public Access, Regional Trails, and Habitat Projects	Access Project). Many other projects are in the planning phase.
8	Infrastructure Improvements Projects	Several infrastructure improvement projects are proposed within Midpen lands in order to maintain a high-quality visitor experience. Several projects currently proposed or underway include: • Midpen Office Building Project • American Disabilities Act (ADA) Self-Evaluation and Transition Plan Update	Implementation of the ADA Self-Evaluation and Transition Plan Update is ongoing. Construction is planned for the Midpen Office Building Project and Mount Umunhum Radar Tower Project will be implemented in the upcoming

ID	Project	Description	Schedule
		• Rancho San Antonio: Interpretive Improvements and Refurbishing • Rancho San Antonio Multimodal Access Project • Mount Umunhum Radar Tower Project • Sierra Azul Ranger Residence • Solar Panels Installation at Skyline Field Office • Various additional grazing infrastructure projects	years. Additional projects are in the early phases of planning and review.
		San Mateo County Parks	
9	Memorial Park Facility Improvement Project	This project is the first comprehensive facility improvement project in the 95-year history of Memorial County Park. The project includes new restroom and shower buildings, resurfaced park roads, improved paths of travel, and accessible features that are ADA compliant.	Construction began in November 2019 and is anticipated to be completed prior to Summer 2021.
10	Memorial Park Wastewater Treatment Facilities Improvement Project	The project would replace Memorial Park's existing wastewater treatment plant facility and septic system with a new wastewater treatment plant located at an overflow parking lot, approximately 150 feet southeast from the existing wastewater treatment plant site. The existing wastewater treatment plant would be repurposed as a lift station. The collection system would also be improved by repairing and replacing select pipe sections and manholes throughout the system. The collection system repairs would be implemented to fix structural defects, lessen infiltration and inflow. Memorial Park is located near La Honda Creek OSP.	The Draft Initial Study/Mitigated Negative Declaration for the project was released in March 2019. Construction began in 2019 and is anticipated to be completed by October 2020.
11	Ohlone-Portolá Heritage Trail Project	The project will design and interpret an anticipated 90-mile Ohlone-Portolá Heritage Trail alignment through San Mateo County. The trail will be designated using segments of the California Coastal Trail, existing sidewalks and/or trails through lands of Peninsula Open Space Trust and Midpeninsula Regional Open Space District, State Parks and the Golden Gate National Recreation Area, and County Parks.	A Feasibility Study was completed in April 2019 and the project was presented and approved by the San Mateo County Board of Supervisors in June 2019. The San Mateo County Historical Association is in the process of formally nominating the Ohlone-Portolá Heritage Trail as a State Historic Trail and is currently requesting letters of support for the nomination.

ID	Project	Description	Schedule
12	Tunitas Creek Beach Improvement Project	The project will protect and improve Tunitas Creek Beach over a 3-year period in order to provide safe public access to the beach as a County Park. Core values to guide design of the project that were identified in the Tunitas Creek Beach Community Advisory Committee's Vision Document include improved environmental protection, equity and inclusion, education and environmental awareness, and outdoor experiences.	The San Mateo County Board of Supervisors accepted the Tunitas Creek Beach Community Advisory Committee's Vision Document in September 2019. The Kick-Off Meeting scheduled for March 2020 was postponed and next steps for the project are currently being planned. The design phase is expected to conclude Summer 2021, followed by implementation of the improvement project.
		San Mateo County Department of Public Works	
13	Bayfront Canal and Atherton Chanel Flood Management and Restoration Project	The project involves the construction of two parallel underground box culverts and associated drainage connections to route a portion of peak flood flows from Bayfront Canal into managed ponds that are part of the Ravenswood Pond Complex portion of the South Bay Salt Pond Restoration Project.	The project is in the final design and environmental review phase. Construction is planned to begin in 2020.
		Santa Clara County Parks	
14	Sanborn County Park Master Plan	The plan provides the foundation necessary to balance natural resources at the Sanborn County Park with long-range development and management throughout the entire park, and at specific features such as the Welch Hurst House, the Christensen Nursey area, the Dyer House, and the former Christmas tree farm area.	The Final Initial Study/Mitigated Negative Declaration for the plan was adopted in June 2019 and implementation of the plan is ongoing.

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5.1.4 Cumulative Impacts and Mitigation Measures

Aesthetics

Geographic Scope

The geographic scope for the analysis of cumulative impacts associated with aesthetic resources includes both local and regional viewsheds. Cumulative aesthetic impacts would generally occur within 1 mile or less of Midpen lands. Beyond 1 mile, objects become less distinct or not visible if they blend in sufficiently with background forms, colors, and textures. Beyond 1 mile it is likely that sightlines would become impaired or blocked by intervening terrain and vegetation. The 1-mile radius also allows for consideration of several of the adjacent open space management areas that provide contiguous forest and wildland areas.

The following projects are considered in this cumulative impact analysis because they would result or have resulted in aesthetic impacts within the geographic scope for the analysis:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Memorial Park Facility Improvement Project
- Memorial Park Wastewater Treatment Facilities Improvement Project
- Ohlone-Portolá Heritage Trail Project
- Tunitas Creek Beach Improvement Project
- Bayfront Canal and Atherton Chanel Flood Management and Restoration Project
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Aesthetics-Cumulative: The proposed Program could result in significant impacts on visual resources in combination with past, present, and probable future development in the cumulative analysis study area.	**Significant and unavoidable contribution**

Temporary, minor visual degradation associated with the cumulative projects listed above could occur within or adjacent to Midpen lands as observed from public areas due to construction and heavy equipment, vegetation clearing for fuel management and trail development, restoration activities, and traffic improvements. However, viewers perceive these visual changes as temporary, and due to the vast extent of Midpen lands, can voluntarily leave the affected area and occupy other open space areas within the region. The construction of new buildings, structures, parking areas, and other improvements associated with cumulative projects (e.g., Midpen Infrastructure Improvements Projects, Midpen Regional Trails, Public

Access, and Education Projects, and the Memorial Park Facility Improvement Project) would not result in significant cumulative impacts because these facilities are similar to those that already exist within Midpen lands. These types of developments would generally occur in already developed locations, minimizing the contrast with the visual character of an area, and would only affect small discrete locations. The creation of new trails and trail connections would not be a significant visual impact because these types of facilities are generally narrow features minimizing the visual change and also already exist within Midpen lands; as such, they would be consistent with the existing visual character.

The combined effects of both the Program and the other similar cumulative projects could result in an impact that is cumulatively significant. Permanent visual impacts associated with construction of the Highway 17 Wildlife and Regional Trail Crossings project could significantly alter the existing visual character of the area; however, the project would provide critical benefits for wildlife and improved accessibility across regional trails in the area. Long-term visual impacts could also occur with implementation of CAL FIRE's and Midpen's vegetation and forest management projects within and surrounding Midpen lands, as these projects include similar fuel treatment activities and would utilize similar equipment. The visual impacts resulting from the CAL FIRE and Midpen Forest Management Projects would resemble the long-term visual changes that would occur with implementation of the Program, and therefore, the Program would contribute to a significant cumulative impact. Implementation of the VMP would result in the removal of trees and other vegetation, which may be considered a visual resource by some viewers. Areas of vegetation treatment would be visible from scenic viewpoints from a distance, as well as in the immediate foreground from scenic trails, roads, and within scenic corridors. Changes in patterns of existing vegetation, including color, line, and form associated with existing vegetation types and density may be considered a degradation of existing visual quality in some areas. These impacts would reduce over time as viewers adjust to the shifts in vegetation forms and configurations but would initially remain significant. The visual impacts of these projects, when viewed together with environmental changes anticipated from the Program, would be cumulatively considerable. MM Aesthetics-1 and MM Aesthetics-2 requires pre-planning actions including desktop and field reviews to reduce visual impacts from scenic areas where possible, for example by avoiding vegetation thinning in certain areas or thinning to a lesser extent to avoid or lessen impacts to scenic character or views from designated scenic areas. Mitigation, however, cannot reduce all significant visual impacts as avoidance or reduced thinning may not be possible everywhere that VMAs are needed. After mitigation, the Program's potential to substantially affect a scenic vista, or substantially degrade the existing visual character or quality of public views would be reduced but would still contribute considerably to an overall cumulatively significant and, thus, potentially unavoidable visual impact.

Air Quality

Geographic Scope

Air quality is a regional resource and is neither defined nor limited by jurisdictional boundaries, political boundaries, or project boundaries. The cumulative study area for air quality primarily

encompasses activities within the same air basins as the Program, specifically the SFBAAB and NCCAB. All of the projects and plans included in the list of cumulative projects are considered in the regional air quality cumulative impacts analysis because they would result in or have resulted in impacts on air quality within the SFBAAB or NCCAB.

The cumulative impact from some pollutants on the health of receptors is much more localized. The geographic extent for cumulative impacts from CO emissions consists of intersections where peak cumulative traffic would occur. The geographic extent for cumulative projects is 1,000 feet, which is generally the distance within which TAC emission concentrations disperse and are no longer a significant health risk. It is not possible to determine ozone concentrations or make a direct correlation to human health impacts because project-focused modeling cannot feasibly predict ozone formation and resulting regional ozone concentrations. Air districts instead generally develop mass emissions thresholds for ROG and NOx that are used to make significance determinations. Refer to Section 4.3: Air Quality for the reasoning as to why ozone concentrations are not discussed further.

Cumulative Impacts

	Significance Determination
Impact Air Quality-Cumulative: The proposed Program could result in significant impacts on air quality in combination with past, present, and probable future development in the cumulative analysis study area.	**Significant and unavoidable contribution**

Regional Nonattainment

Overview

Regional air quality is affected by all activities that occur within an air basin. Midpen lands are under the jurisdiction of two air districts. The majority of Midpen lands are located in SFBAAB, with a smaller portion within NCCAB. The attainment conditions and sources of air pollutants within each air basin differs (refer to Table 4.3-2 in Section 4.3: Air Quality for attainment designations). As such, the significance thresholds identified by each individual air district will be used to determine whether the emissions generated by Program activities proposed to occur within each air basin will result in a cumulative impact.

SFBAAB

The SFBAAB is in nonattainment for $PM_{2.5}$, PM_{10}, and ozone. Past and present projects in the SFBAAB have resulted in the nonattainment statuses. The cumulative impact from past, present, and probable future projects on criteria pollutants for which the SFBAAB are in nonattainment would be significant.

Cumulative impacts on regional air quality are addressed by the BAAQMD thresholds of significance for operational criteria pollutant emissions in the SFBAAB because BAAQMD considered all past, present, and probable future projects when they set the thresholds of significance. The construction thresholds represent the levels at which a project or plan's individual combustion emissions of criteria air pollutants and precursors would result in a

cumulatively considerable contribution to the existing nonattainment designations. If a project's emissions exceed the numerical thresholds in the SFBAAB, the project would considerably contribute to the cumulatively significant air quality impact. If a project's emissions do not exceed the numerical thresholds in the SFBAAB, the project would not considerably contribute to the cumulatively significant air quality impact.

The Program activities would generate annual emissions in excess of the significance thresholds for PM_{10}, $PM_{2.5}$, and NOx, a precursor to ozone. These exceedances would occur primarily due to prescribed burning, resulting in a considerable contribution to regional pollutants in nonattainment. MM Air Quality-2 requires Midpen to consider and implement techniques to minimize particulate matter emissions including mosaic burning and pre-treatment. After mitigation, the Program's potential to contribute to existing regional nonattainment would be reduced but would still contribute considerably to an overall cumulatively significant impact. The Program would have an unavoidable cumulatively significant impact.

NCCAB

The NCCAB is in nonattainment for PM_{10} and nonattainment-transitional for ozone. Past and present projects in the NCCAB have resulted in the nonattainment statuses. The cumulative impact from past, present, and probable future projects on criteria pollutants for which the NCCAB are in nonattainment would be significant.

Similarly, cumulative impacts on regional air quality in the NCCAB are addressed by the 2016 Guidelines for Implementing the CEQA thresholds of significance for operational criteria pollutant emissions in the NCCAB. Like SFBAAB, an exceedance of the numerical significance thresholds would constitute a contribution to the cumulatively significant air quality impact.

Program activities would generate maximum daily emissions of PM_{10} and NOx in excess of thresholds under Scenario 1, involving prescribed burning of acres of grassland. Under scenario 2, pile burning, daily emissions thresholds for PM_{10} would be exceeded. No emissions exceeded daily significance thresholds under scenario 3, which represented a maximum day of manual and mechanical vegetation removal. MM Air Quality-2 requires Midpen to consider and implement techniques to minimize particulate matter emissions including mosaic burning and pre-treatment. After mitigation, the Program's potential to contribute under scenario 2 would be reduced to not be cumulatively considerable. Under scenario 1 (prescribed burning), the potential to contribute to existing regional nonattainment would be reduced but would still contribute considerably to an overall cumulatively significant impact. The Program would have an unavoidable cumulatively significant impact.

Localized Emissions

Carbon Monoxide

Carbon monoxide hotspots, fugitive dust emissions, or diesel emissions have the potential to result in localized impacts. Vehicle trip increases during construction and operation of cumulative projects could elevate CO emissions at intersections. CO emissions generated from gas-powered truck traffic and other combustion equipment during construction activities could

result in CO hotspots, or localized concentrations of CO. Diesel-powered vehicles and equipment, such as those used for construction or vegetation management activities, do not emit CO in the same concentrations and are less likely to cause a CO hotspot. As such, congested intersections with a large volume of traffic have the greatest potential to cause high, localized concentrations of CO, which could affect public health. On-road, motor vehicle exhaust in metropolitan areas accounts for as much as 75 percent of CO emissions based on data collected across the nation (USEPA, 2010). CO emissions and concentrations have been continually decreasing and have not exceeded the 8-hour federal or state air quality standard at any monitoring location, nationwide[1] in decades (USEPA, 2017). Prescribed burning implemented by cumulative projects and the Program could result in CO hotspots, however, the hotspot would be localized in the immediate area around the burn. Burns are not typically conducted near urban areas and receptors, nor are multiple burns conducted directly adjacent to each other. BAAQMD guidelines indicate that a project would significantly affect CO levels if project traffic would increase traffic volumes at intersections to more than 44,000 vehicles per hour. None of the cumulative projects include large-scale development associated with substantial increases in traffic and the Program would contribute on average, 60 one-way trips a day. The cumulative impact from localized CO emissions would be less than significant.

Toxic Air Contaminants

Vehicles and equipment used during construction of the cumulative projects would generate localized diesel and fugitive dust emissions near sensitive receptors. Cumulative projects, particularly Midpen's Natural Resource Protection and Restoration Projects along SR-35, could affect the same sensitive receptors as the Program (sensitive receptors within 1,000 feet of cumulative project and Program work areas). Construction of the cumulative projects has the potential to subject sensitive receptors to elevated TAC emissions for a prolonged period. Receptors near prescribed or pile burns would be especially at risk of elevated TAC emissions. Use of equipment and vehicles at Program sites may generate some TAC emissions; however, the consecutive duration of exposure on a sensitive receptor from the nearest cumulative projects and the Program would be limited to typically less than a week. Burn event locations would be distributed throughout Midpen lands, limiting the cumulative concentrations at any one sensitive receptor. Pile burn smoke would not be expected to affect a large number of people due to the duration of the burn, wet weather conditions, and limited size of the burn area. TAC emissions from cumulative projects (e.g., park renovations and land management) are limited due to the size and types of equipment and vehicles anticipated to be used. Burns conducted as part of cumulative projects (e.g., CalVTP) are generally not conducted directly adjacent to another active prescribed burn, as the number of burns allowed in a basin at one time is controlled by the air districts through a daily burn authorization system intended to minimize smoke impacts and public nuisance (CCR §80145[a]). Localized TAC emissions from

[1] United States Environmental Protection Agency Region 9, which includes California, Nevada, and Arizona, has 28 monitoring locations where CO data is collected.

cumulative prescribed burns are not expected to accumulate. The Program's contribution to cumulatively significant impacts on sensitive receptors from air toxics would be less than significant.

Biological Resources

Geographic Scope

The geographic scope for the biological resources cumulative analysis includes all similar habitats within 1 mile of Midpen lands. This geographic scope is appropriate because it accounts for the cumulative degradation or loss of a particular vegetation community or special-status species population from all projects that have impacted or would impact vegetation communities of concern or special-status species.

The following projects are considered in the cumulative impact analysis because they would occur within the geographic scope and have the potential to cause an adverse impact on biological resources:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Memorial Park Facility Improvement Project
- Memorial Park Wastewater Treatment Facilities Improvement Project
- Ohlone-Portolá Heritage Trail Project
- Tunitas Creek Beach Improvement Project
- Bayfront Canal and Atherton Chanel Flood Management and Restoration Project
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Biological Resources-Cumulative: The proposed Program could result in significant impacts on biological resources in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

Vegetation Communities and General Wildlife

Nearly every project that occurs in open space areas surrounding Midpen lands would have cumulative impacts on vegetation and wildlife habitat of varying degrees, depending on the extent and intensity of the project. Of the cumulative projects and plans considered, management plans involve work within native habitat and could alter native habitat both beneficially and adversely. Management plans that increase recreation, for example, could increase impacts on biological resources due to increased noise and human presence in certain

areas. Management plans also identify ways to preserve land and biological resources resulting in a beneficial impact in the long-term. Individual cumulative projects implemented in habitat may permanently convert sensitive vegetation communities and habitat to non-habitat. Temporary disruptions to general wildlife in the area could also occur. Conversely, some individual projects specifically aim to improve habitat. These projects may result in cumulative significant adverse impacts in the short-term due to increased activity (e.g., vegetation removal) but would result in long-term beneficial impacts on biological resources. Long-term cumulative impacts to vegetation and general wildlife are not anticipated.

The Program would have similar impacts as some of the cumulative management projects. The Program would generally benefit native vegetation and wildlife in the long-term. Beneficial impacts include enhancing native vegetation habitats, promoting habitat diversity, and reducing risks of large wildland fires that could have catastrophic habitat impacts. Enhancing habitat would provide a benefit to general wildlife species as well. Sensitive vegetation communities may be altered by Program activities and recurring activities could convert sensitive communities resulting in the cumulative loss of regionally rare or significant communities. Alteration of vegetation types could result in the loss or conversion of habitat relied on by wildlife, further limiting habitat connectivity in the region. The Program could result in cumulatively considerable impacts on sensitive vegetation communities as well as general wildlife. Midpen best management practices, implementation of relevant permit conditions (i.e., 1600 permits, 401 permits, 404 permits), and numerous mitigation measures identified in Section 4.4: Biological Resources would minimize direct and indirect conversion of sensitive vegetation communities and would require compensation for any unavoidable significant losses. Therefore, implementation of the Program would not contribute to any regional, short- or long-term cumulatively significant impacts with mitigation.

Special-Status Plant Species

Most of the cumulative projects occurring within the geographic range involve some vegetation modification or removal. Given the wide geographic distribution of cumulative projects and that not all locations of special-status plants are known, there is a potential for a significant cumulative impact on special-status plant populations if a population is lost through the impacts of multiple projects. Cumulative impacts could be significant.

Implementation of the Program may affect the population size of special-status plants on Midpen lands, given that all of the actions central to the Program would involve vegetation modification activities. These modification activities could contribute to the loss of regionally rare special-status plant species, which could be a considerable contribution to the cumulatively significant impact. The Program's considerable contribution, however, would be minimized through IPMP BMPs and mitigation measures as identified in Section 4.4: Biological Resources, which require pre-treatment surveys, implementation of a training program to inform workers on the various special status species that may occur and how to avoid harming the species, as well as practices to minimize spread of forest diseases and invasive species. Mitigation measures require flagging to identify special-status plants in a work area, monitoring, avoidance, and, where needed, compensatory mitigation for loss of special-status plants. These

measures would ensure that Program work would not threaten special-status plant species population. The Program's contribution to a significant cumulative impact would be minimized with implementation of mitigation.

Special-Status Animal Species

Seventy-one special-status wildlife species were identified that are known to occur or could possibly occur on Midpen lands, but only a few federally or state listed threatened, endangered, or candidate species are known to occur on Midpen lands (or waters within). These species are listed below. The last two in the list, the Ridgeway's rail and salt-marsh harvest mouse, are only found in salt marsh habitats on the bay shoreline.

- Steelhead – central California coast DPS pop. 8 (*Oncorhynchus mykiss irideus*)
- Foothill yellow-legged frog (West/Central coast clade) (*Rana boylii*)
- California red-legged frog (*Rana draytonii*)
- San Francisco garter snake (*Thamnophis sirtalis tetrantaenia*)
- Ridgway's rail *(Rallus obsoletus)*
- Salt-marsh harvest mouse *(Reithrodontomys raviventris)*

Cumulative projects conducted on Midpen lands and other projects in the general region (such as on San Mateo County Parks land) could impact the same populations and species. The habitats on Midpen lands are often contiguous with other open space areas, or support very similar habitats. Direct impacts from construction and operation of equipment to implement the cumulative projects or implementation of the cumulative plans could have similar significant impacts on special-status wildlife species and migratory species. If these projects, as a whole, resulted in the death or injury of individuals that comprise a population, a significant impact could occur. Given the number of projects in the region and without being able to understand the individual effects on special status species of each cumulative project or program, a potentially cumulatively significant impact is assumed.

The Program's contribution to a cumulatively significant impact could be considerable. Numerous BMPs and mitigation measures, however, have been identified to minimize impacts on special-status animal species from Program actions. Most of these measures involve pre-activity surveys and avoidance, or relocation of the animal, when relocation is permissible. Measures address worker training as well as species-specific avoidance and minimization measures for special-status amphibians and aquatic species, special-status insects (e.g., butterflies, moths, bees), nesting birds, special-status birds (e.g., marbled murrelet), special-status reptiles (e.g., San Francisco garter snake), and special-status mammals. Other measures address and minimize Program-related erosion and sedimentation that could affect aquatic species. With implementation of these measures, the Program would have limited impacts on special status species and, therefore, the Program's contribution to significant cumulative impacts would be reduced to less than significant.

Cultural and Tribal Cultural Resources

Geographic Scope

The geographic extent for the cultural resources cumulative analysis includes areas in and immediately adjacent to Midpen lands because an impact would only occur if a cumulative project were to impact the same type of resources affected by the Program.

The following projects are considered in this cumulative impact analysis because they would involve vegetation removal or ground disturbance within Midpen lands:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Cultural and Tribal Cultural Resources-Cumulative: The proposed Program could result in significant impacts on cultural or tribal cultural resources in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

Cumulative projects that involve ground disturbance have the potential to impact recorded and previously undiscovered cultural resources. Program activities could disturb the ground and damage or destroy archaeological or historic resources. Cumulative projects that require the use of heavy equipment or ground disturbance and overlap with the Program work areas may impact the same types of cultural resource, which could result in a significant cumulative impact, since it could result in the loss of information from the prehistoric or historic record. Cumulative impacts are potentially significant.

Cultural history could be lost if several unique archaeological resources, tribal resources, or human burials are damaged by various construction projects, which would be considered a cumulatively significant impact. The Program's contribution to a significant cumulative impact could be considerable. Midpen requires staff at each site to receive training to recognize sensitive cultural resources and to halt work in the event of a cultural resource discovery until a qualified archaeologist can evaluate the significance of the find (IPMP BMP 26; Contract Condition 4.3). MM Cultural-1 would reduce impacts on cultural resources requiring review of Midpen's existing GIS data on cultural resource survey areas and identification of known cultural resources that overlap work areas. A pre-activity survey is required if the area has not been previously surveyed and involves ground disturbance. Any identified cultural resources within areas proposed for work would be avoided and the area of avoidance marked in the

field. Any known resources are either to be avoided entirely or evaluated for eligibility and if eligible but not avoidable, treated under MM Cultural-2. If human remains are found during Program implementation, work must stop, and appropriate measures detailed in the mitigation must be implemented. The measure also requires consultation with Native American groups if any prehistoric resources are identified and impacts cannot be avoided or minimized. Implementation of mitigation would minimize the Program's contribution to an otherwise cumulatively significant impact on known cultural and tribal resources.

Geology and Soils

Geographic Scope

Geology and Soils

The geographical extent for cumulative impacts on geology and soils includes areas in and immediately adjacent to Midpen lands because erosion and soil stability impacts from a particular activity would be confined to immediately adjacent areas. Landslides caused by a particular project or activity can impact off-site areas, but the project or activity would still need to occur or be located adjacent to Midpen lands to result in cumulative impacts with the Program.

The following cumulative projects would involve vegetation removal or ground disturbance within or immediately adjacent to Midpen lands:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Sanborn County Park Master Plan

Paleontological Resources

The geographic extent for cumulative impacts on paleontological resources includes areas underlain by geologic units from the same time periods as Midpen lands because an impact would occur if a cumulative project were to result in the loss of the same types of unique paleontological resources as the Program. Most of the cumulative projects would involve ground disturbance in areas underlain by similarly aged geologic units.

Cumulative Impacts

	Significance Determination
Impact Geology and Soils-Cumulative: The proposed Program could result in significant impacts on geology and soils in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

Cumulative projects listed above would involve activities such as heavy equipment use and grading of trails that could destabilize slopes and soils or result in substantial soil erosion or the loss of topsoil and landslides, which would be a cumulatively significant impact. The Program would involve tree and vegetation removal, prescribed herbivory, prescribed burning, and installation of firefighting infrastructure. Soils within the Program area could become unstable due to the intensity of tree and vegetation removal, livestock grazing, prescribed burning, and grading for infrastructure, given the erodible soils and moderate to steep slopes prevalent across Midpen lands. The Program's contribution to a significant cumulative impact on erosion and slope stability could be considerable.

Midpen requires that erosion control measures be implemented before or after vegetation treatment near sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment (IPMP BMP 28). MM Geology-1, MM Geology-2 and MM Geology-3 would reduce potential erosion impacts by requiring implementation of several erosion control measures to avoid sedimentation of waterways or waterbodies, and erosion of steep slopes and existing erosional features or erodible soils that may result from heavy equipment use and prescribed burns and grazing. Implementation of these measures would stabilize the slopes associated with Program activities and limit the amount of erosion and slope instability that could occur. By minimizing erosion and slope instability risks from activities, the Program's contribution to potentially significant cumulative impacts on geology and soils would be less than cumulatively considerable with mitigation.

	Significance Determination
Impact Paleontological Resources-Cumulative: The proposed Program could result in significant impacts on paleontological resources in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution**

The majority of the geologic units that underlie Midpen lands and cumulative projects have low potential to yield unique paleontological resources. Cumulative projects that involve use of heavy equipment and ground disturbance; however, still have the potential to impact unique paleontological resources. A loss of similar types of paleontological resources from multiple projects could result in a significant cumulative impact.

The Program would result in soil disturbance, particularly through vegetation removal activities, but would not extend to the depth that paleontological resources are usually found. In the unlikely event Program activities unearth a unique paleontological resource, Midpen

requires paleontological resource identification training and stop work procedures if a resource is found. Implementation of this measure would ensure that paleontological resources within Midpen lands are recognized and avoided. The Program would not have a cumulatively considerable contribution to a significant impact.

Greenhouse Gas Emissions

Geographic Scope

GHGs are global pollutants and have long atmospheric lifetimes of one year to several thousand years, which permits dispersal of GHGs around the globe. In contrast to air quality, which generally is a regional or local concern, human-caused emissions of GHGs have been linked to climate change on a global scale. The geographic extent for the GHG emissions cumulative analysis is global. The quantity of GHGs required to ultimately result in climate change is not precisely known. A single project is very unlikely to measurably contribute to a noticeable incremental change in the global average temperature, or to the global, local, or microclimate.

Cumulative Impacts

	Significance Determination
Impact GHG-Cumulative: The proposed Program could result in significant impacts on greenhouse gas emissions in combination with past, present, and probable future development in the cumulative analysis study area.	**Significant and unavoidable contribution**

GHG emissions and climate change are inherently cumulative impacts. Past, present, and probable future projects worldwide contribute or would contribute to the cumulative conditions for GHG emissions. The cumulative impact of GHG emissions and climate change is significant.

Use of vehicles and equipment as well as pile and prescribed burning during implementation of the Program would generate GHG emissions. Implementation of the Program would also have some effects to carbon sequestration. Implementation of Program activities that involve vegetation removal and modification would result in some short-term losses in carbon stock. Other vegetation management programs in the region and even across the State could result in some removal of carbon stock from forests and other managed lands, which could be considered a cumulatively significant impact on carbon sequestration. The Program objectives and treatments proposed are intended to reduce the likelihood of catastrophic fire and severity of a wildland fire and the associated loss of carbon stocks. The Program is consistent with Statewide plans to manage forests that recognize the benefit of reduced wildland fire risks and long-term carbon sequestration outweighs the short-term carbon loss to some degree. Even so, GHG emissions generated would be magnitudes greater than existing conditions and could contribute to a cumulatively significant impact. The Program would have an unavoidable cumulatively significant impact on the environment.

Hazards, Hazardous Materials, and Wildland Fire

Geographic Scope

The geographic extent for the analysis of cumulative impacts associated with hazardous materials and wildland fire is the area within approximately 0.25 mile of Midpen lands. This geographic extent is appropriate to account for the small volume of hazardous materials that would be used during implementation of the Program and the potential for that material to be transported offsite during upset or accident conditions. The 0.25-mile distance also accounts for the likelihood of encountering contaminated soil from existing hazardous material sites. Cumulative impacts from wildland fire ignition could span a larger area. However, increased risks from various activities would generally only accumulate when the actions occur in the same areas (on Midpen lands). The Program is designed to improve and reduce wildland fire risks overall.

The following projects are considered in this cumulative impact analysis because they could result in the same type of hazard impact as the Program on Midpen lands or on immediately adjacent lands, where impacts could combine:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects

Cumulative Impacts

	Significance Determination
Impact Hazards-Cumulative: The proposed Program could result in significant impacts on hazardous materials and wildland fire in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

Routine Transport, Use, and Disposal of Hazardous Materials and Accidental Hazardous Materials Releases

Construction, operation, and/or implementation of cumulative projects and implementation of the Program would use equipment and vehicles that could leak hazardous materials, including gasoline and diesel fuel, engine oil, coolant, lubricants, and grease. Hazardous materials, particularly fuel, may be transported to and from each site, which would increase the risk of accident and release. The hazard to the public from fuel leaks from the cumulative projects would be highly localized geographically and temporally, due to the small amount of hazardous materials that typical vehicles and equipment would use and the quick response time to clean up any spill.

Cumulative projects, including Midpen's IPMP, may involve use of chemicals including herbicides. Herbicide use under Midpen's IPMP and the Program would be conducted in accordance with Midpen's requirements to minimize risk of herbicide use on the public or the environment. Herbicides must be applied under the guidance of licensed and certified personnel and according to Midpen's recommendations and herbicide label requirements; applicators must use appropriate protective equipment; a 5-foot no-spray buffer must be established or the area closed for 24 hours; that application must be conducted so as to avoid drift; and storage, handling, and disposal of herbicides must be conducted appropriately (IPMP BMPs 7, 9, 10, 34, 35; MO Manual Section 17.005 and 17.006). The cumulative impact from accidental releases of hazardous materials or herbicide use would, therefore, be less than significant.

Hazardous Materials Sites

Exposure to hazardous materials from disturbance of contaminated sites are very localized impacts. Three hazardous-materials sites listed on government databases remain open on Midpen lands at Sierra Azul OSP, Miramontes OSP, and Ravenswood OSP. The Mount Umunhum Radar Tower Project involves repairs to avoid future hazardous materials contamination concerns and has been closed to public, therefore no risk of exposure to hazardous materials is associated with this project. The Beatty Parking Area and Trail Connections Project and several other cumulative projects are located within Sierra Azul OSP. The VMP would involve some fire-management activities in and around the area of the former Almaden AFS in Sierra Azul OSP. Cumulative impacts from releases caused by these other projects and the Program could be potentially significant.

The Program could contribute to a cumulatively significant impact from work in and around the area of the former Almaden AFS in Sierra Azul OSP. MM Hazards-1 requires Program activities to avoid areas containing residual contamination within any known contaminated sites or contaminated sites listed on government databases (e.g., the former Almaden AFS, Madonna Creek Ranch). With implementation of this measure, workers would not be exposed as part of the Program implementation or release contamination into the environment and, therefore, the Program would not contribute to a potentially cumulatively significant impact.

Wildland Fire

The purpose of the Program and cumulative vegetation management projects (CAL FIRE CalVTP) are largely to reduce fuel loads and wildland fire risks over the baseline conditions. Construction or implementation of cumulative projects that involve the use of heavy machinery, prescribed and pile burns, or off-road vehicle use would increase risk of starting a fire within or surrounding Midpen lands. The cumulative risk of ignition of a wildland fire could be significant.

Implementation of the Program could have similar impacts of increased risk of wildland fire ignition from use of mechanical equipment, workers smoking, and escaped prescribed or pile burns resulting in considerable contribution to a significant cumulative increase in fire risk. Midpen requires worker training in fire prevention and suppression, presence of fire-

suppression equipment at all work areas, and work to stop in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). Adherence to regulatory requirements, including preparation of a Smoke Management Plan and Burn Plan, would limit potential for escape of a prescribed fire, but may not be adequate to prevent harm to recreationalists or the public on trails and roads adjacent to prescribed burn areas. MM Hazards-2 would reduce potential of wildland fire by requiring workers to implement specific fire risk reduction measures for stockpiling and pile burning. MM Hazards-3 requires road and trail closures and the preparation of a Traffic Control Plan for greater safety around prescribed burns. These measures would significantly reduce the risks of wildland fire while work is being performed and, therefore, minimize the Program's contribution to cumulatively increased risks of wildland fire ignition. Furthermore, the activities implemented as part of the Program are intended to reduce the size, spread, and intensity of wildland fire in the long-term within and surrounding Midpen lands. The Program's contribution to an overall increased wildland fire risk would not be cumulatively significant.

Very High Fire Hazard Severity Zones

Several cumulative projects and the Program would involve construction, operation, or implementation of activities within areas classified as very high fire hazard severity zones. As analyzed above, a cumulative increase in wildland fire ignition risk could occur due to the types of activities that would be conducted as part of the cumulative projects. Some cumulative vegetation management projects would ultimately reduce risk of wildland fire ignition, although may temporarily increase the risk during implementation. Smoke from ignited wildland fires could cumulatively expose sensitive receptors to pollutant concentrations. The cumulative increase in wildland fire ignition risk in very high fire hazard severity zones could result in a significant cumulative impact.

The Program's implementation could contribute to that risk. The Midpen and regulatory requirements discussed above require adherence to fire prevention and suppression measures during Program activities, as well as mitigation measures to reduce the risk of escaped pile or prescribed burns would be implemented. Compliance with regulatory requirements, Midpen standard practices, and mitigation measures would minimize the Program's contribution to cumulatively significant increased wildland fire risks in very high fire hazard severity zones to less than significant. As discussed above, one of the objectives of the Program is to minimize wildland fire risks in the long-term as well as enhance local agencies' abilities to suppress wildland fire in areas of high fire hazard.

Hydrology and Water Quality

Geographic Scope

Surface Water

The geographic scope for the analysis of cumulative impacts associated with hydrology and water quality is limited to the area within or very close to Midpen lands. Projects may result in

cumulative water quality and sedimentation impacts if they occur in the same watershed as the Program and can impact the same waterways and waterbodies.

The following projects are considered in the cumulative impact analysis because they could have water quality and/or erosion impacts and would occur in the same watersheds as the Program's water quality and/or erosion impacts:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Bayfront Canal and Atherton Chanel Flood Management and Restoration Project

Groundwater

The geographic scope for the cumulative groundwater analysis is limited to those projects that would be constructed in areas where the local groundwater basins recharge or that would require water that could be sourced from local groundwater. The Santa Clara subbasin recharge areas are in alluvial fan and fluvial deposits along the edge of the Santa Clara Valley floor (Valley Water, 2016).

The following projects are considered in the cumulative impact analysis because they could have impacts on groundwater recharge or supplies:

- Midpen Preserve and Master Plans
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Memorial Park Facility Improvement Project
- Memorial Park Wastewater Treatment Facilities Improvement Project
- Tunitas Creek Beach Improvement Project
- Bayfront Canal and Atherton Chanel Flood Management and Restoration Project
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Hydrology-Cumulative: The proposed Program could result in significant impacts on water resources in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

Surface Water

Past and present projects in the San Francisco Bay Area have impaired the waterbodies and waterways within and downstream of Midpen lands (refer to Table 4.9-3 in Section 4.9: Hydrology and Water Quality). Ground disturbing activities associated with the cumulative projects could affect or exacerbate water quality conditions in downstream areas, as

construction, vegetation management, or road and trail maintenance and usage could all result in erosion resulting in mobilization of sediments and pollutants into downstream areas. Construction activities and tree removal implemented as part of the Program activities could expose bare soil and increase runoff as well as sediment loads and other pollutants into downstream areas. The Midpen IPMP and potentially other cumulative projects, would involve use of chemicals that could enter waterways through overspray or herbicide drift. The impacts on downstream water quality from implementation of cumulative projects could be cumulatively significant.

The Program would include activities that could contribute to erosion and sedimentation and involves increased usage of herbicides over that proposed in the IPMP. The Program could contribute to a significant cumulative impact as proposed. Midpen's standard practices require erosion control, spill prevention, and herbicide handling measures that would minimize some risks on water quality from Program activities (IPMP BMPs 4, 5, 9, 28; MO Manual Sections 14.005 and 13.010; Safety Manual Sections 1.6.5 and 1.6.6). MM Geology-1 and MM Geology-2 include several erosion control measures that, where implemented, would minimize the mobilized sediment from work areas. MM Hydrology-1 requires avoidance of instream crossings or performing work when the waterway is dry and obtaining the necessary permits, on the rare occasion water bodies may need to be crossed with equipment where there is not an existing crossing. With these measures, the Program would limit erosion that could lead to sedimentation and minimize risks on water quality from other pollutants such as herbicides and petroleum products. The Program's contribution to potentially significant cumulative impacts from sedimentation on water quality would be less than cumulatively considerable with mitigation.

Groundwater

The Santa Clara subbasin is sustainably managed and is not currently in a condition of chronic overdraft. Past projects have not contributed to a current significant cumulative impact. Several cumulative projects would require water for temporary dust control during construction. Cumulative recreational facility or infrastructure projects (e.g., Memorial Park Facility Improvement Project) would require a permanent source of water, but as small projects, it is not anticipated that withdrawals would be excessive. Implementation of the Program would not require the use of substantial groundwater and would not considerably deplete groundwater supplies. A small increase in impervious surfaces in the areas of groundwater recharge may occur as a result of constructing the cumulative projects and the wildland firefighting infrastructure as part of the Program. Due to the relatively small scale of the cumulative increase in impervious surfaces, significant cumulative effects on recharge would not occur. Cumulative impacts related to groundwater management, recharge, and depletion would be less than significant.

Noise

Geographic Scope

The geographic extent for the analysis of cumulative impacts associated with noise is limited to areas within 500 feet of Midpen lands. This geographic extent is appropriate because noise levels attenuate rapidly with distance and the noise generated by activities greater than 500 feet from the Program would not combine with the noise generated by the equipment and vehicles proposed for use under the Program.

The following projects are considered in this cumulative impact analysis because they would generate noise within the defined geographic scope during implementation of the Program:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Noise-Cumulative: The proposed Program could result in significant impacts on noise levels in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

The noise from cumulative project activities could increase ambient noise temporarily in excess of local noise standards. Equipment and vehicles used during implementation of the Program would temporarily increase ambient noise at discrete work areas throughout the lifetime of the Program. Noise associated with simultaneous construction or land management activities of several cumulative projects could compound with noise generated by equipment and vehicles used during implementation of the Program. Sensitive receptors located within Midpen lands and within 500 feet of Midpen lands could be subjected to these increased noise levels resulting in a cumulatively significant noise impact.

Due to the proximity of Program activities to the cumulative project sites listed, the Program's contribution to a significant cumulative impact from temporary increases in ambient noise in excess of noise standards could be considerable. Midpen prohibits nighttime work in excess of local noise standards (IPMP BMP 29). MM Noise-1 would reduce noise impacts by requiring establishment of noise buffers for certain equipment required for implementation of Program activities when in proximity to receptors. Noise can also have impacts on biological resources. Noise impacts on sensitive species, particularly marbled murrelets and nesting birds, are mitigated to less than significant through MMs Biology-11 and Biology-12. Midpen would also

schedule its activities on its own land and projects would not likely occur in the same location at the same time. Mitigation would reduce the Program's contribution to a significant cumulative impact to less than significant.

Recreation

Geographic Scope

The geographic extent for the analysis of cumulative impacts associated with recreation includes recreational areas within approximately 1 mile of Midpen lands. Midpen lands are a regional recreational area, which attract people from San Mateo, Santa Clara, and Santa Cruz counties, as well as neighboring counties. A 1-mile-area surrounding Midpen lands includes many other regional open spaces and parks that are most likely to be used by the same population that uses the amenities affected by the Program.

The following projects are considered in this cumulative analysis because they would impact recreation on Midpen lands or on lands connected to Midpen lands:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Memorial Park Facility Improvement Project
- Memorial Park Wastewater Treatment Facilities Improvement Project
- Tunitas Creek Beach Improvement Project
- Bayfront Canal and Atherton Chanel Flood Management and Restoration Project
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Recreation-Cumulative: The proposed Program could result in significant impacts on recreation in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution**

Cumulative projects may require temporary or periodic recreational facility closures, as would the Program during construction, operation of heavy equipment, or prescribed burning. These temporary closures, however, would affect only small areas of the overall areas available for recreation within Midpen lands and the overall region. Several cumulative projects would also involve improvements of recreational facilities and trails. The cumulative projects would not degrade existing recreational facilities or result in a significant increase in use of other recreational facilities due to temporary closures and activities. The cumulative impact would be less than significant.

Transportation

Geographic Scope

The geographic extent for the transportation cumulative analysis includes the local and regional roadways and highways that would be utilized for transportation of Program materials and workers. The extent of the analysis specifically includes all projects within 1 mile of the Program because these projects are expected to use the same roads for access.

The following projects are considered in this cumulative impact analysis because they would potentially generate impacts on emergency access or traffic flow in the same place and at the same time as the Program:

- CAL FIRE CalVTP
- Midpen IPMP
- Midpen Forest Management Projects
- Midpen Preserve and Master Plans
- Midpen Natural Resource Protection and Restoration Projects
- Midpen Regional Trails, Public Access, and Education Projects
- Midpen Infrastructure Improvements Projects
- Memorial Park Facility Improvement Project
- Memorial Park Wastewater Treatment Facilities Improvement Project
- Bayfront Canal and Atherton Chanel Flood Management and Restoration Project
- Sanborn County Park Master Plan

Cumulative Impacts

	Significance Determination
Impact Transportation-Cumulative: The proposed Program could result in significant impacts on traffic in combination with past, present, and probable future development in the cumulative analysis study area.	**Less than significant contribution with mitigation**

Transportation Hazards

Construction of the cumulative projects within Midpen lands could increase truck traffic to and from work sites along the same roadways identified as routes for the Program. Cumulative projects that are adjacent to Midpen lands would increase truck traffic on public roads in the region. Cumulative traffic hazards could occur from changes in traffic flow. Several cumulative projects, specifically Midpen IPMP; Midpen Forest Management Projects; and Midpen Regional Trails, Public Access, and Education Projects, could result in temporary closures of roads or lanes during project activities. Overlapping timelines between the cumulative projects and the Program would increase the potential for conflict between large trucks along the truck routes, particularly if lanes or roads are closed.

The same egress points from paved roads onto unpaved roads may be used for cumulative activities on Midpen lands or adjacent lands, such as simultaneous Program and CAL FIRE CalVTP activities. Activities may also use egress points that are in different locations but along

the same roads that Program activities would use for egress. This usage could change the traffic flow at several points along one roadway. Several cumulative projects and the Program involve activities along roadways. Heavy equipment and other vehicles could use or park along the same roadways. Prescribed and pile burns may be conducted adjacent to roadways, but typically adjacent landowners would not conduct these activities simultaneously in the same area.

The impacts would be too localized to accumulate. Standard operating procedures following California MUTCD including signage and flaggers, would be implemented by all cumulative projects to reduce potentially hazardous situations at points of ingress and egress, and from equipment and vehicles along roads. All cumulative project, including the Program, would be required to acquire encroachment permits prior to work within roads, which would include stipulations to minimize traffic hazards. The cumulative impact would be less than significant.

Emergency Access

Lane or full road and trail closures may be required during construction of several cumulative projects on and around Midpen lands. Closures have the potential to restrict or slow down emergency vehicles and responders. Several cumulative projects, specifically Midpen projects and the Program, could result in temporary closures of trails, roads, or lanes in the same general area, which could cumulatively result in a significant impact due to restricting or delaying emergency access, which would be considered a potentially significant cumulative impact.

MM Transportation-1 requires Midpen to implement provisions to allow access for emergency responders across or through any work site. Unattended vehicles and equipment would be required to park in areas that would leave roads open for emergency access. With this mitigation, the Program would have very limited impacts on emergency access and, therefore, would not contribute considerably to a cumulatively significant impact.

5.2 Growth-Inducing Impacts

Section 15126.2(d) of the CEQA Guidelines (proposed amendments, as of July 2018) requires preparers of an EIR to consider the growth-inducing impacts of a proposed project. Section 15126.2(d) states that the EIR should:

> Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects that would remove obstacles to population growth.

The Program would not involve the construction of housing and would therefore not directly induce population growth. The Program does not involve the expansion of infrastructure, such as roadways or sewer lines and it also does not involve the construction of a new facility that would indirectly induce population growth. It could generate up to 30 new full-time jobs, but workers are anticipated to be sourced from the existing and projected population in the region

and would not induce substantial growth. Implementation of the Program would not have any direct or indirect growth inducing impacts.

5.3 Significant and Irreversible Changes

5.3.1 Requirements

Section 15126.2(c) of the CEQA Guidelines requires preparers of an EIR to identify significant irreversible environmental changes that would be caused by the proposed project, should it be implemented. Section 15126.2 provides the following three examples of irreversible changes:

- Uses of nonrenewable resources may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely
- Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses
- Environmental accidents associated with the plan can result in irreversible damage

5.3.2 Use of Nonrenewable Resources

The Program would require a permanent commitment of nonrenewable resources resulting from the direct consumption of fossil fuels. The Program activities would involve vehicle and equipment use for worker travel, equipment transport, and equipment operation, which use nonrenewable fossil fuels. Fuel consumption to implement the Program is not considered wasteful given the positive outcome of the work to improve ecosystem health and reduce wildland fire hazards. Vehicle engines and fuel used during implementation of the Program would comply with energy reduction and efficiency requirements at the state and local level. Implementation of the Program would, therefore, efficiently use nonrenewable energy resources.

5.3.3 Changes in Land Use which would Commit Future Generations

The Program does not involve a change in land use that would commit future generations to a single use. The activities within the Program are meant to preserve and enhance the existing open space and natural land uses on Midpen lands. No change to the use of Midpen properties is proposed.

5.3.4 Environmental Accidents

Accidental Release of Hazardous Materials

As discussed in Section 4.8: Hazards and Hazardous Materials, the Program would involve limited quantities of miscellaneous hazardous substances, such as fuels and oils to run and maintain vehicles and other mechanized equipment. The Program would also involve use of herbicides. Workers handling hazardous materials would adhere to WPS, OSHA, and Cal/OSHA health and safety requirements. Midpen is required to have a Spill Prevention

Control and Countermeasures Plan to cover the fuel storage tanks used to fuel Program vehicles and equipment. Additionally, fueling and any fuel spills would be handled according to Midpen's spill prevention and handling of hazardous materials BMPs, which would ensure that hazardous materials are properly stored on-site and that any accidental releases of hazardous materials would be properly controlled and quickly cleaned up. Implementation of the Midpen requirements and proper herbicide application following label instructions would minimize the potential for spills and leaks. A spill or leak of hazardous materials during Program implementation would not occur in a great enough quantity to result in irreversible environmental damage.

Accidental Wildland Fire

An accidental wildland fire could trigger irreversible environmental damage. Prescribed and pile burning would be implemented as part of the Program. Equipment and vehicles as well as worker negligence could spark a fire accidentally. Midpen requirements include worker training in fire prevention and suppression, including requiring fire-suppression equipment at all work areas and stopping work in extreme fire weather to ensure that no fires are accidentally set (MO Manual Section 13.005; Safety Manual Chapter 1.7.0.0; RM Policy WF-1). Adherence to regulatory requirements, including preparation of a Smoke Management Plan and Burn Plan, would minimize the risk of an escaped prescribed burn. MM Hazards-2 would reduce the potential of accidental wildland fire by requiring workers to implement specific fire risk reduction measures for stockpiling and pile burning. MM Hazards-3 requires road and trail closures and the preparation of a Traffic Control Plan for greater safety around prescribed burns. The Program objectives and treatments proposed are intended to reduce the likelihood of catastrophic fire and severity of a wildland fire. The risk of igniting an accidental wildland fire during implementation of the activities in the Program would be minimized and in the long-term, the Program would reduce the risk of a catastrophic wildland fire.

5.4 Significant and Unavoidable Impacts

The Program would result in significant unavoidable impacts on aesthetics from tree and vegetation removal and air quality and global GHG emissions from generation of criteria air pollutant and GHG emissions during implementation of activities. Mitigation would reduce these impacts but not to less than significant levels. Mitigation has been identified and implemented to reduce all other potentially significant impacts to less than significant.

5.5 Effects Found Not to Be Significant

CEQA Guidelines section 15128 states that:

> An EIR shall contain a statement briefly indicating the reasons that various possible significant effects of a project were determined not to be significant and were therefore not discussed in detail in the EIR. Such a statement may be contained in an attached copy of an Initial Study.

Midpen identified effects found not to be significant from Program implementation in Section 4.1.2: Effects Found Not to be Significant. Impacts identified in this section are less than significant without mitigation or have no impact and are not discussed further in the Program EIR.

6 Alternatives to the Program

6.1 Introduction

6.1.1 CEQA Requirements

Section 15126.6 of CEQA requires that an EIR describe a range of reasonable alternatives to the project (or Program, as applicable here) that would feasibly attain the basic objectives and avoid or substantially lessen any significant effects. Alternatives may be eliminated from detailed analysis in the EIR if they fail to meet the most basic of project objectives, are determined to be infeasible, or cannot be demonstrated to avoid or lessen significant environmental impacts. More specifically, Guidelines Section 15126.6(a) states:

> "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible."

Key provisions of this CEQA Guideline are summarized below:

- The discussion of alternatives shall focus on alternatives to the Program, which are capable of avoiding or substantially lessening any significant effects of the Program, even if these alternatives would impede to some degree the attainment of the Program objectives, or would be more costly.
- The No Project Alternative shall be evaluated along with its impact. The No Project analysis shall discuss the existing conditions at the time the notice of preparation is published, as well as what would be reasonably expected to occur in the foreseeable future if the Program were not approved.
- When the No Project Alternative is the revision of an existing land use or regulatory plan, policy, or ongoing operation, the No Project Alternative will be the continuation of the existing plan, policy, or operation into the future.
- The range of alternatives required in an EIR is governed by a "rule of reason;" therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice. What constitutes a "reasonable range" of alternatives will vary with the facts of each project and should be guided only by the purpose of offering

substantial environmental advantages over the project proposal which may be "feasibly accomplished in a successful manner" considering the economic, environmental, social, and technological factors involved (See Citizens of Goleta Valley v. Board of Supervisors [1990] 52 Cal. 3d 553, 801 [citing PRC Sections 21002, 21061.1; CEQA Guidelines Section 15364]).

- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.
- Not every conceivable alternative must be addressed, nor do infeasible alternatives need to be considered (14 CCR § 15126.6 [a]).
- The factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, other plans or regulatory limitations, jurisdictional boundaries, and whether the proponent can reasonably acquire, control, or otherwise have access to alternative sites. (14 CCR § 15126.6[f][1]). Additionally, the EIR needs to examine in detail the basic Program objectives.

An EIR need not consider every conceivable alternative to a project (CEQA Guidelines Section 15126.6[a]; Mount Shasta Bioregional Ecology Center v. County of Siskiyou [2012]) 210 Cal.App.4th 184. CEQA establishes no absolute legal imperative as to the scope of alternatives to be analyzed in an EIR.

6.1.2 Program Objectives

The Program will guide Midpen's activities over the next decade or more and will be periodically updated, as needed, to adapt it to changing conditions and improved knowledge. The objectives of the Program are defined in the Program and in Chapter 3.0: Project Description of this Program EIR. The Program objectives include the following:

1. Manage vegetation (including invasive fire-prone trees) to establish healthy, resilient, fire-dependent or fire-adapted ecosystems, furthering Midpen's mission to protect and restore the diversity and integrity of the ecological processes on Midpen lands and facilitate healthy post-fire recovery.
2. Integrate Native American traditional ecological knowledge practices of natural resource management, particularly as they relate to prescribed fire, that promote ecological resiliency and enhance biodiversity.
3. Manage vegetation (including invasive fire-prone trees) and infrastructure on Midpen lands to reduce wildland fire risks, improve wildland fire fighting capabilities and coordination, and improve overall safety to reduce the harmful effects of wildland fire on people, property, and natural resources.
4. Provide an adaptive framework for periodic review of and revisions to Midpen decisions in response to a changing climate, improved knowledge, and improved technology. This framework also considers competing Midpen priorities, capacity, funding and fiscal sustainability, and partnerships to determine the location, scale, and timing of future vegetation management activities.

6.2 Alternatives Screening Methodology

6.2.1 CEQA Requirements for Alternatives

The evaluation of alternatives to the Program was performed using a screening process that consisted of three steps:

- Step 1: Clarify the description of each alternative to allow comparative evaluation.
- Step 2: Evaluate each alternative using CEQA criteria (defined below).
- Step 3: Determine the potential feasibility of each alternative to determine which alternatives will undergo full analysis in the EIR.

Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage over the Program were eliminated from further analysis. Following the three-step screening process, the advantages and disadvantages of the remaining alternatives were carefully weighed as part of Step 2, with respect to CEQA's criteria for consideration of alternatives. The criteria are discussed in greater detail here.

6.2.2 Consistency with Program Objectives

Alternatives should meet most of the basic Program objectives. CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives" (section 15126.6 [b]). Therefore, it is not required that each alternative meet all the Program objectives.

6.2.3 Feasibility

The CEQA Guidelines (section 15364) define feasibility as:

> "…capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

The selection of alternatives is largely governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused, not on every possible eventuality, but rather on the alternatives necessary to permit a reasoned choice. Of the alternatives identified, the Program EIR must analyze those alternatives that are feasible, while still meeting most of the Program objectives.

According to the CEQA Guidelines (section 15126.6([1]), site suitability, economic viability, availability of infrastructure, general Program consistency, consistency with other programs and policies or other regulatory limitations, jurisdictional boundaries, and proponent's control over alternative sites are all considered factors when determining whether alternatives are

potentially feasible. The feasibility of potential alternatives was assessed taking the following factors into consideration:

- **Environmental Feasibility**. Would implementation of the alternative cause substantially greater environmental damage than the Program, thereby making the alternative clearly inferior from an environmental standpoint? This issue is primarily addressed in terms of the alternative's potential to eliminate significant or potentially significant effects of the Program.
- **Regulatory Feasibility**. Do regulatory or policy restrictions substantially limit the likelihood of successful implementation of an alternative? Is the alternative consistent with policies and regulatory standards or on-going Midpen practices related to regulated activities such as herbicide use, prescribed burning, and work near sensitive habitats?
- **Technical Feasibility.** Is the alternative feasible from a technological perspective, considering available technology? Are there any implementation constraints that cannot be overcome?
- **Economic Feasibility**. Is the alternative so costly that implementation would be prohibitive? The CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly" (CEQA Guidelines section 15126.6[b]). The Court of Appeals added in Goleta Valley v. Board of Supervisors (2nd Dist. 1988) 197 Cal.App.3d, p. 1181 (see also Kings County Farm Bureau v. City of Hanford [5th Dist. 1990] 221 Cal.App.3d 692, 736 [270 Cal. Rptr. 650]): "[t]he fact that an alternative may be more expensive or less profitable is not sufficient to show that the alternative is financially infeasible. What is required is evidence that the additional costs or lost profitability are sufficiently severe as to render it impractical to proceed with the project." An example would be the costs for mowing all grassland areas annually (refer to Section 6.3 for additional discussion of alternatives considered but rejected from further analysis).

6.2.4 Potential to Eliminate Significant Environmental Effects

CEQA requires that to be fully considered in an EIR, an alternative must have the potential to "avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines section 15126.6[a]). Identified alternatives that clearly do not provide overall environmental advantage(s) when compared to the Program are eliminated from further consideration. At the screening stage, CEQA does not require the evaluation of all impacts of the alternatives in comparison to the Program with absolute certainty; nor is it possible to quantify all impacts.

Table 6.2-1 presents a summary of the potential significant environmental effects and the significant unavoidable impacts of the Program (in bold italic in the table), as identified in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures. The impacts in Table 6.2-1

were used to determine whether an alternative met CEQA Guidelines section 15126.6 requirements.

Table 6.2-1 Summary of the Program's Potentially Significant Impacts that can be Mitigated, and Significant and Unavoidable Impacts

Environmental Parameter	Potential Impacts
Aesthetics	• ***Potentially significant and unavoidable impact from the potential to adversely affect scenic vistas or substantially degrade visual character from implementation of the VMP, PFP, and installation of new infrastructure.*** • ***Potentially significant and unavoidable impact from the potential to damage scenic resource, including removal of trees as viewed from a State scenic highway.***
Air Quality	• ***Significant and unavoidable impact from a considerable contribution to regional particulate matter and ozone precursor emissions that are in nonattainment, primarily from prescribed burning under the PFP.*** • Potentially significant but mitigable impacts from pile burning under the VMP in the NCCAB. • ***Significant and unavoidable short-term impacts on sensitive receptors and due to odors from smoke generated by prescribed fires under the PFP.*** • Potentially significant but mitigable impacts from serpentine dust generation under the VMP for activities that could disturb the soil surface.
Biological Resources	• Potentially significant but mitigable impacts on rare plants and special-status wildlife species, including San Francisco garter snake, California red-legged frog, Foothill yellow-legged frog, western pond turtle, California giant salamander, Santa Cruz black salamander, red-bellied newt, marbled murrelet, special status insect host plants (e.g., for bay checkerspot butterfly, Smith's blue butterfly, monarch butterfly, unsilvered fritillary butterflies, and Opler's longhorn moths), salmonids, special status bats, and nesting birds. Impacts could occur from vegetation management activities under the VMP, prescribed burning under the PFP, and installation of infrastructure under the Wildland Fire Pre-Plan. • Potentially significant but mitigable impact on sensitive natural communities, including wetlands and other jurisdictional aquatic resources, forest and woodlands, chaparral, and grasslands from use of heavy equipment and vegetation management/fuel reduction under the activities defined in the VMP. • Potentially significant but mitigable impacts associated with a violation of a local tree ordinance from activities identified in the VMP or Wildland Fire Pre-Plan.
Cultural Resources	• Potentially significant but mitigable impacts on known and previously undiscovered historic, prehistoric, and tribal cultural resources from ground disturbing activities associated with the VMP, from prescribed burning under the PFP, and from infrastructure development under the Wildland Fire Pre-Plans. • Potentially significant but mitigable impacts on human remains from ground disturbing activities.

Environmental Parameter	Potential Impacts
Geology and Soils	• Potentially significant but mitigable impacts from loss of topsoil and erosion due to ground disturbing activities from the VMP, prescribed burning under the PFP, and potential installation of new infrastructure under the Wildland Fire Pre-Plan. • Potentially significant but mitigable impact from landslides due to vegetation removal on steep slopes under the VMP. • Potentially significant but mitigable impact from installation of new infrastructure in expansive soils under the Wildland Fire Pre-Plan.
Greenhouse Gases	• ***Potentially significant and unavoidable impact from GHG emissions associated with implementation of vegetation treatments, pile burning, and prescribed burning under the PFP.***
Hazards, Hazardous Materials, and Wildland Fire	• Potentially significant but mitigable impact from exposure to hazardous materials from areas of contamination listed on government databases. • Potentially significant but mitigable impact to emergency access during implementation of Program activities. • Potentially significant but mitigable impact from exposure to hazards associated with pile burns by staff conducting the pile burns. • Potentially significant but mitigable impact to recreationalists from smoke exposure from prescribed burns. • Potentially significant but mitigable impacts related to risks to structures and people from slope instability.
Hydrology and Water Quality	• Potentially significant but mitigable impact associated with erosion from various VMP activities, prescribed burning under the PFP, and installation of new infrastructure under the Wildland Fire Pre-Fire Plan that could cause sedimentation of creeks, streams, or other waterways.
Noise	• Potentially significant but mitigable impact from equipment to implement the VMP activities, prescribed burning under the PFP, and installation of new infrastructure under the Wildland Fire Pre-Plans that could generate noise in violation of County or local noise standards.
Recreation	• Potentially significant but mitigable impacts to recreationalist safety from prescribed burns under the PFP.
Transportation	• Potentially significant but mitigable impacts to safety of the public (e.g., motorists, bicyclists) on public roads from prescribed burning under the PFP. • Potentially significant but mitigable impact to emergency access during implementation of Program activities.

See Chapter 2: Executive Summary for a more detailed summary of the impact conclusions and mitigation measures identified.

6.3 Alternatives Considered but Not Evaluated in Detail

CEQA Guidelines section 15126.6(c) states that an EIR should briefly describe the rationale for selecting the alternatives to be discussed in an EIR and the reasons for eliminating alternatives

from detailed consideration. Alternatives are eliminated if they did not meet most of the basic Program objectives, were not feasible, and/or would not avoid or substantially lessen the significant environmental effects of the Program as assessed in the EIR. Midpen considered several alternatives that were subsequently eliminated from further consideration. Table 6.3-1 provides a description of each rejected alternative and the rationale for rejection.

Table 6.3-1 Rejected Alternatives

Description of Alternative	Rationale for Rejection
Mowing of all Grasslands. This alternative focuses on grasslands within the Program area and includes treating these areas with frequent, intensive line-trim mowing instead of other methods, such as prescribed fire or prescribed herbivory. The intent of the intensive mowing would be to unearth dormant native seeds. Treatments for all habitat types outside of grasslands would be the same as described in the Program. Source: Scoping Comments	This alternative does not meet the feasibility screening criteria. Feasibility in the context of grassland management under the Program for Midpen must consider annual direct costs, annual staff resource requirements, net habitat benefits, and ability to effectively replicate the tools, practices, and approaches across approximately 9,000 acres of grassland habitat[a] on Midpen OSPs in the plan area (approximately 12 percent of the plan area). Based on preliminary information, this alternative would require annual mowing of all grasslands, equating to 350 hours per acre. With 9,000 acres of grasslands, this methodology would require 3.15 million hours of mowing per year. The costs to take this approach under a mowing alternative is at least a magnitude of order greater than the proposed annual budget for Midpen. The costs of this approach are therefore infeasible. In addition, there is limited research on the effects of this treatment for fire resiliency and needs further study. Refer to the No Prescribed Fire Plan Alternative for an analysis of the impacts associated with no prescribed burning on Midpen lands, including grasslands.
Increased Intensity of Treatments. This alternative would include increasing the amount of area treated in the VMP. Source: Scoping Comments	This alternative would not avoid or reduce any direct impacts of the Program and instead would result in greater environmental impacts from erosion and on water quality, air quality, GHG emissions, traffic, and from temporary noise due to the increased level of activities and increased acres of treated areas. It should be noted that this alternative could have added benefits to ecosystem health and resiliency and further reduce fire hazards in the long-term and reduce the severity of impacts should a wildland fire occur. The Program is optimized to maximize the use of available resources while balancing the short-term impacts with the long-term benefits (and reducing the potential for much more significant future and long-term impacts that arise with major wildland fires). Given the adaptive nature of the Program, work could potentially be scaled up, as long as direct environmental impacts stay below levels of significance and no new impacts not described in this Program EIR are created. The level of effort identified in the WFRP is based on a number of factors, including financial resources and staffing resources available to implement and oversee the Program. The amount of

Description of Alternative	Rationale for Rejection
	effort identified was also scaled such that successes in reducing wildlife risks while improving ecosystem resiliency could be realized.
Alternative Methods of Vegetation Removal. This alternative includes using alternative methods of vegetation treatments, such as biological controls, more prescribed herbivory, or other types of location-specific treatments. Source: Scoping Comments	Most of these methods implemented alone or instead of mechanical removal would not allow Midpen to meet its overall objectives. The WFRP is based on methods proven effective in the field through the IPMP and based on industry experience and accepted best practices. That said, the Program includes a Monitoring Plan that employs adaptive management. If new methods prove effective, they could be added to the Program through amendments.
Increased Scope of WFRP. This alternative includes increasing the scope of the WFRP to also include enhancing the character of Midpen lands by implementing carbon sequestration activities and other activities to enhance soil moisture, biodiversity, and habitat. Source: Scoping Comments	While an expanded scope of work to address new goals and objectives is possible, it is rejected as it does not reduce any environmental effects of the Program and could result in new potentially significant impacts from expansion of the Program. The Program as proposed is focused on vegetation management and fire protection improvements to reduce fire risk and enhance ecosystem resiliency to fires. The suggested alternative is instead focused on strategies to reduce greenhouse gas emissions and enhance habitat health. Although these goals have their own merits, they are not central to the goals and objectives of the Program. Other, separate programs could be established to address carbon sequestration and habitat health in the future.
Focus Program only on Fire Protection. This alternative would focus only on the creation and maintenance of enhanced fire management VMAs and implementation of the Wildland Fire Pre-Plan. No ecosystem resiliency activities would be included, including no creation and implementation of FRAs under the VMP, and the Program would not include the PFP. The scale and implementation of the Monitoring Plan would be greatly reduced due to the lack of ecosystem resiliency activities. Source: Midpen	This alternative would not meet the basic objectives of the Program related to ecosystem resiliency. While the alternative would improve firefighting and fire protection, it would provide no improvements to ecosystem resiliency as it relates to fire that, in the long-term, would contribute to reduced effects of wildland fire.
Reduced Program – Reduce Annual Treatment of Fuel Management Areas. Under this alternative, maximum annual acreages of treatment areas (e.g., fuelbreaks, disclines) would be reduced to equal the annual acreage of ecosystem resiliency FRAs. Total new areas treated would be reduced to 1,000 acres and total acreages maintained would also be reduced	This alternative meets basic Program objectives but effectiveness towards the third objective of improving firefighting capabilities and reducing effects to property and natural resources would be reduced as it would take longer to build out all fuel management areas. This alternative is feasible but ultimately does not substantially lessen any of the potentially significant impacts of the Program and instead delays the potential impacts to later years, since it only reduces the amount of work that would be

Description of Alternative	Rationale for Rejection
to 1,000 acres maximum per year. The treatment reduction would be approximately 40 percent less per year than proposed. The total acreage that could be treated under the overall Program over time would remain the same, but incremental impacts per year would be reduced and the Program would take longer to implement in total. Source: Midpen	conducted in any one year and total Program impacts would be the same, only taking longer to occur.

Note:

[a] The acreage presented here includes grassland vegetation communities (refer to Appendix 4.4) as well as grasslands in woodlands and savannahs.

6.4 Alternatives Considered for Detailed Evaluation

This section discusses alternatives that passed the screening process and have been retained for analysis in the Program EIR, including the No Program Alternative, as required by CEQA. Table 6.4-1 provides a list of the alternatives considered and the results of the screening analysis with respect to the criteria findings for consistency with Program objectives, feasibility, and environmental effectiveness (reduces environmental impacts as identified in Chapter 4 of this Program EIR). Each of these alternatives, other than the No Program Alternative, would substantially meet most of the Program objectives, would be feasible, and would generally reduce some potential environmental effects of the Program. It should be noted that while these alternatives reduce environmental impacts, it is typically through reducing the amount of vegetation management activities performed, which comes as a tradeoff in the extent the alternative reduces wildland fire hazards and thus potentially reduces environmental impacts of a wildland fire.

6.4.1 No Program Alternative

Description of Alternative

Pursuant to CEQA Guidelines section 15126.6(e), an EIR must include an evaluation of a No Project (Program) Alternative, so that decision makers can compare the impacts of approving the Program with the impacts of not approving the Program. The evaluation of the No Program Alternative must discuss the existing conditions at the time the NOP was published (April 2020), as well as "what would be reasonably expected to occur in the foreseeable future if the Program were not approved, based on current plans and consistent with available infrastructure and community services" (CEQA Guidelines section 15126.6[e][2]). The No Program Alternative considers the reasonably foreseeable actions that would be implemented by Midpen if the Program is not approved.

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Table 6.4-1 Screening Summary of Alternatives Retained for Analysis in the Program EIR

Summary of Alternative	Program Objectives Criteria	Feasibility Criteria	Environmental Criteria
No Program Alternative Continue vegetation management activities as currently performed. No prescribed burning and no expanded activities under the VMP would be performed.	Although the alternative provides for some vegetation management activities under the existing IPMP, this alternative does not substantially meet any of the objectives of the Program. Status quo does not further reduce the existing fire threat to Midpen lands and natural resources, nor improve current fire response or suppression activities, nor further increase the level of ecosystem resiliency within habitats.	Meets feasibility criteria	Meets environmental criteria. This alternative would reduce direct, significant WFRP impacts to air quality and GHG emission impacts, soil erosion impacts, water quality impacts, and impacts on special-status species and communities, primarily because significantly less work and no prescribed burning would occur.
No Prescribed Fire Plan Alternative This alternative would involve removal of the PFP from the Program, and no prescribed burning would be implemented. Pile burning under the VMP would still be allowed at a reduced level to remove biomass.	Meets basic objectives but does not meet the second objective of integrating Native American methods of vegetation management involving prescribed fire for ecosystem resiliency. Limits or reduces the effectiveness of the Program with regard to the objectives of establishing resiliency and ecosystem health and reducing fire impacts to property and natural resources.	Meets feasibility criteria	Meets environmental criteria. This alternative would reduce significant and unavoidable impacts from criteria pollutant and GHG emissions of the Program from prescribed burning.
Reduced Program – Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management This alternative would include a scheme to reduce the acreages of VMAs for enhanced fire management. This alternative would, in the long term, result in less total acreage of enhanced fire management VMAs. Correspondingly fewer acres of enhanced fire management VMAs would be treated each year as well.	This alternative meets basic Program objectives but limits the effectiveness towards the third objective of improving firefighting capabilities and reducing fire impacts to property and natural resources.	Meets feasibility criteria	Meets environmental criteria. This alternative would reduce overall impacts to any resources for which the VMP would have an impact, such as to biological resources (rare plants, special-status species habitat, sensitive communities), cultural resources, hydrology, visual resources, and others. Mitigation would still be required and the alternative may still result in significant and unavoidable impacts to aesthetics, air quality, and GHG emissions. The alternative still meets the criteria for detailed evaluation as it would reduce impacts.

Summary of Alternative	Program Objectives Criteria	Feasibility Criteria	Environmental Criteria
Reduced Program – No Acacia or Eucalyptus Removal, and Limit Treatments in Sensitive Communities to Fuel Reduction Areas This alternative would eliminate the acacia and eucalyptus removal. It would also include only FRA-level work in any sensitive vegetation community identified in this Program EIR.	This alternative meets basic Program objectives but limits the effectiveness towards the third objective of improving firefighting capabilities and reducing fire impacts to property and natural resources and it does not meet the component of the objective to manage fire-prone trees.	Meets feasibility criteria	Meets environmental criteria. Potentially significant and unavoidable visual impacts from intensive eucalyptus tree removal as viewed from scenic areas would be avoided by this alternative, although other significant and unavoidable visual impacts from VMA creation and prescribed burning would remain. Minor but potentially significant impacts could also be lessened, including impacts to special-status butterflies and nesting raptors associated with eucalyptus, as well as other impacts such as erosional impacts and slope stability impacts from large and intensive tree removal. Impacts to identified sensitive vegetation communities (e.g., riparian areas) would also be reduced (but not eliminated), by reducing the extent of work that would occur within these communities. Because the PFP and prescribed fires would still be implemented under this alternative, significant unavoidable impacts of the Program on air quality and GHG emissions would remain.

This alternative includes not undertaking the VMP or PFP. Any new firefighting infrastructure, if determined necessary, may be installed on a case-by-case basis, with individual CEQA review, as needed. Limited fuel management work would continue as described and addressed under the IPMP.

The Program was developed to reduce what could potentially be substantially greater environmental impacts should a major wildland fire occur, even though implementation of the Program could result in some unavoidable resource impacts, as summarized in Table 6.2-1. Midpen conducts fuel treatments under existing conditions, but to a far lesser scale than the Program (up to nearly 900 more acres of maintenance and up to 1,230 acres of newly created fuel management areas). Less of Midpen lands would be treated in any given year under the No Program Alternative. Implementation of the Program may result in potentially significant and unavoidable aesthetic, air quality, and GHG impacts; however, impacts from a large and intense wildland fire ignited in untreated areas under the No Program Alternative could potentially be far greater than any Program impacts.

Many studies have been conducted on the efficacy of fuel treatments, including thinning and prescribed burns to reduce the risks associated with and that alter the behavior of wildland fire. Fuel treatments may not necessarily minimize the frequency of wildland fire ignition, but fuel treatments have been shown to reduce fire intensity and severity. For example, a study on the 2014 Carlton Complex Fire in north central Washington by the University of Washington and the U.S. Forest Service found that previous tree thinning and prescribed burns helped forests survive the fire (Susan J. Prichard, 2020). A case study of the Tahoe Basin also demonstrated through modeling that fuel treatments created more diverse forest conditions by shifting dominance patterns to a more mixed conifer system. Treated forests in the modeling had a higher proportion of fire-tolerant species. Strategically placed fuel treatments were shown to substantially reduced wildland fire risk, increase fire resiliency of the forest, and provide benefits for long-term carbon management (Loudermilk, Stanton, Scheller, Dilts, & Peter J. Weisberg, 2014). Refer to Section 4.8.4 for more information on studies of wildland fire severity after forest treatments.

Impacts from the increased potential for more severe wildland fire activity under the No Program alternative is summarized below. The No Program Alternative does not meet the Program objectives, notably, objective three as it pertains to managing vegetation to reduce wildland fire risk and to reduce the harmful effects of wildland fire on natural and cultural resources, people, and property. The importance of fully meeting this objective can be illustrated in the impacts presented below. It should be noted that even with implementation of the Program, future wildland fire location, timing, extent, and impacts are unknown. Well-performed management of excess fuels on the landscape, however, should lessen the severity of a wildland fire, if it were to occur in a treated area.

Rationale for Full Analysis and Relationship to Program Objectives

The No Program Alternative would not meet the basic objectives of the Program; however, it is presented here for full analysis as required under CEQA.

Summary of Comparative Environmental Impacts

Overview

All direct and indirect impacts of implementing the VMP and Wildland Fire Pre-Plan under the Program, as identified in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures of this Program EIR, would not occur under the No Program Alternative. Some fuel management activities would continue on a limited basis under the IPMP and those impacts have been addressed under the IPMP Final EIR and Addendum. Due to the reduced area of fuel management as compared to the Program, a greater portion of Midpen lands would be untreated and at a higher risk of severe wildland fire. The types of effects that could occur in the event of wildland fire ignition are described in this analysis of the No Project Alternative. Firefighting infrastructure may be installed under the No Program Alternative, but CEQA reviews would be conducted on an individual basis, with similar impacts as identified for the proposed Program.

Aesthetics

Less of Midpen lands would be treated under the No Program Alternative eliminating the significant and unavoidable aesthetic impact identified under the Program. However, a wildland fire ignited or moving into an untreated landscape on Midpen lands would likely be more severe and result in loss of most vegetation, charred ground and vegetation creating significant contrast and degrading visual quality, and potential mortality of a significant number of trees over a large area, including as viewed from designated scenic areas. A severe wildland fire could have much greater and more significant visual impacts from scenic viewpoints, roads, trails, and corridors compared to the impacts from the proposed Program and would likely result in greater degradation of visual quality over the burned areas than would occur had those areas been treated under the proposed Program.

Air Quality and GHG

The direct significant and unavoidable air quality and GHG impacts of the Program would not occur under the No Program Alternative.

Annually, wildland fires represent a variable and not insignificant portion of particulate-matter emissions in SFBAAB as well as California as a whole (CARB, 2020b; CARB, 2013). Without the increase in vegetation management treatments proposed by the Program, wildland fire hazards would remain high in many areas of Midpen lands. Under the No Program Alternative, a severe wildland fire has a higher likelihood of occurring. In the event of a severe wildland fire, large quantities of air quality and GHG emissions would be emitted. It is expected that a wildland fire on Midpen lands would have many times greater criteria pollutant and GHG emissions than Program activities, including prescribed burning, and would likely burn a larger area, due to the uncontrolled nature of wildland fires. Although the total emissions from pre-treatment and prescribed burn activities, in addition to a post-treatment wildland fire may be equivalent to a wildland fire ignited prior to treatment, based on modeling, the avoidance of a catastrophic wildland fire reduces human exposure to air pollutants. This is primarily because prescribed burns (the largest emitting fuel management activity) are conducted during optimal

weather conditions to limit smoke and air quality impacts on nearby communities (Hyde & Strand, 2019).

Biological Resources
Less of Midpen lands would be treated annually as compared to under the Program, which would reduce the direct and indirect impacts of these treatments on biological resources.

Wildland fire can burn with much greater severity in untreated areas, however, due to the presence of excessive debris, overgrowth of understories, high density of trees, and ladder fuels. The intensity of fire can result in a complete loss of habitat and potential mortality for wildlife. Even for species and communities that benefit, such as chaparral and coastal scrub communities (Keeley, 2008) or San Mateo woolly sunflower (*Eriophyllum latilobum*), extreme wildland fire behavior and temperatures could damage the seedbank or cause mortality. Large tree mortality is also possible. Impacts to sensitive communities, plants, and wildlife, including listed species, can be severe in the event of a catastrophic wildland fire due to the high heat, less ability to choose less impactful control line locations, and large size.

Cultural and Tribal Cultural Resources
Direct impacts to cultural and tribal cultural resources from vegetation treatments be greatly reduced under the No Program Alternative, as vegetation management would be limited to that described in the IPMP.

The fuel management activities conducted under the No Program Alternative would leave a larger portion of Midpen lands untreated compared to the Program. These areas could be impacted by a severe wildland fire, if one is ignited or moves into the area. Direct or first order impacts to archaeological or historic resources include damage from heat; the deposition of combustion products (e.g., tars, soot, and ash) on the resource; and the exposure of cultural resources to discovery. Indirect or second order effects include the destruction or redistribution of artifacts due to accelerated erosion of the burned site. The reduced intensity of wildland fire in a treated landscape may be easier to contain and suppress, and the fireline intensity may be reduced, which means that compared to the Program, the impacts on cultural resources may be greater should a wildland fire occur under the No Program Alternative. Control line installation for prescribed fire or less severe wildland fires can be placed to avoid or minimize effects on cultural resources, compared to a severe wildland fire where control line placement cannot always be located optimally for resource avoidance.

Geology and Soils
Direct impacts from vegetation treatments that could result in landslides or soil erosion would be reduced under the No Program Alternative since much less vegetation treatment would occur.

The untreated areas of Midpen lands, however, would be at a higher risk of a severe wildland fire. A severe wildland fire would more likely increase the mortality of vegetation, including trees can alter soils, result in soil instability, and thus devastating post-fire erosion, debris flows, and landslides can occur. Topsoil can be lost from the extreme heat of a wildland fire.

Potentially greater slope and soil instability could occur in the event of a severe wildland fire as compared to the Program.

Hydrology and Water Quality
Direct impacts to hydrology and water quality, primarily from sedimentation from erosion, would be greatly reduced under the No Program Alternative, since much less vegetation treatments would occur.

A wildland fire, however, has a higher risk of becoming severe on untreated lands. Water quality can be affected from a severe fire due to runoff from burned areas containing ash, which may have significant effects on the chemistry of receiving waters such as lakes, wetlands, reservoirs, and rivers. Runoff from burned areas also produces higher nitrate, organic carbon, and sediment levels, warmer temperatures, and flashier stream flows that can result in downstream flooding. Severe wildland fires often burn larger areas due to difficulty in fire suppression and containment. The larger burn area and greater quantity of vegetation burned by a major fire compared to a prescribed burn as proposed under the Program or a less severe wildland fire would contribute more contaminants and have greater effects on water quality.

Utilities and Recreation
Impacts to utilities and recreation would be greatly reduced under the No Program Alternative, since work would be limited the current levels of work under the IPMP.

The less area of fuel management on Midpen lands could result in a higher risk of severe wildland fire and consequently greater risk to utilities and recreational facilities. Wildland fires can affect utilities, particularly severe fires, melting electrical wires, damaging cell phone towers, and destroying water facilities that have not been hardened against wildland fire (e.g., above ground water lines or storage and treatment facilities). Wildland fire can result in the loss of recreational areas including infrastructure and habitat that is the basis of the recreational experience.

Conclusions
The No Program Alternative would avoid all the direct impacts from the VMP and PFP. This alternative, however, would have no ability to improve ecosystem health on Midpen lands, nor would it reduce the risk of severe wildland fire since fuel treatments would not increase from existing levels, nor would it provide improved fuel management for firefighting and safety. The No Program Alternative does not meet any of the Program objectives since no new work would be performed under this alternative, except for potentially some piecemeal installation of firefighting infrastructure. The work currently conducted under the IPMP includes some fuel management treatments for defensible space, fuelbreaks, and disclines but is very limited compared with the Program's VMP. The IPMP includes up to 136 acres of manual and mechanical treatments, combined with other ongoing fuel management would total approximately 505 acres of fuel management, as compared with up to 2,630 acres of fuel treatments under the WFRP's VMP. Prescribed burning would not occur under the No Program Alternative.

While the No Program Alternative would reduce all impacts associated with Program implementation identified in this Program EIR, Midpen would be unable to substantially reduce the threat of wildland fires that could potentially severely damage visual resources, natural resources, and Midpen's assets, as well as result in direct and indirect impacts to surrounding communities through loss of lives or damage and loss of personal property, and result in health-related impacts from smoke. A major wildland fire could affect many resources with greater severity and more certainty than the impacts from implementing the Program. Viewers sensitive to changes and scenic vistas would experience greater effects. Large-scale wildland fires also result in substantial quantities of GHG emissions. Approximately 28.6 metric tons of CO_2 were emitted per acre burned in wildland fires in California in 2019 (CARB, 2020a). Smoke from uncontrolled wildland fires can create toxic air quality conditions for days across the Bay Area and California. Loss and damage to property and loss of life can be substantial. While it is unknown where or with what intensity a wildland fire can occur, implementing vegetation management and prescribed fire, as proposed under the Program, can reduce hazards and thus reduce the associated consequences and impacts, should a largescale wildland fire occur. The threat of these potential long-term impacts of a severe wildland fire outweigh the largely mitigable direct impacts of conducting the Program.

6.4.2 No Prescribed Fire Plan Alternative

Description of Alternative

This alternative would involve removal of the PFP from the Program, and no prescribed burning would be implemented. Up to 500 less acres of land would be treated per year with removal of prescribed burning. Pile burning under the VMP would still be allowed. All other plans would be implemented as described in the proposed Program.

Rationale for Full Analysis and Relationship to Program Objectives

This alternative is brought forward for full analysis as it would result in implementation of the VMP, Wildland Fire Pre-Plan, and Monitoring Plan, which would allow for the accomplishment of most of the basic objectives of the Program. Given the absence of prescribed fire work, Midpen would be unable to meet all the Program objectives as effectively as for the proposed Program, particularly those objectives related to habitat resiliency, cultural burning, and reducing wildland fire hazards.

Summary of Comparative Environmental Impacts

Overview

This alternative would avoid all impacts identified in the PFP from prescribed burning. The primary impacts reduced by this alternative are from criteria pollutant and GHG emissions. Other impacts could be reduced but would not be substantially reduced since the VMP and installation of infrastructure under the Wildland Fire Pre-Plans would still be implemented in the same manner as described for the proposed Program.

Impacts to ecosystem health and resiliency would be potentially greater under this alternative, since it does not include any prescribed fire. Prescribed fire promotes fire-adapted vegetation,

reduces fuel loads to control the severity of wildland fires, and reduces invasive non-native plants.

Lessened Impacts

Aesthetics

Significant and unavoidable visual impacts associated with the appearance of burn scars in the year after the burn would be avoided by this alternative. Other significant visual impacts would remain, however, from the creation of new fuelbreaks and other VMAs. Most visual impacts would be the same as for the Program, as they are associated with the VMP and Wildland Fire Pre-Plan, which would be implemented in the same manner under this alternative. Overall, visual impacts would remain significant and unavoidable, although somewhat reduced.

Air Quality

The No PFP alternative would greatly reduce the air quality impacts as evaluated in this Program EIR. Most of the air quality emissions exceedances under the Program are from prescribed burning in the PFP (see Section 4.3: Air Quality, Table 4.3-7). Emissions across all parameters would be well below thresholds even without mitigation under this alternative. Potential health impacts on workers from prescribed burns would not occur, although health risks from pile burns could still occur and would be reduced through the same mitigation as identified for the Program. Asbestos impacts would be similar and would require the same mitigation as for the Program.

GHG Emissions

Similar to criteria pollutant emissions, prescribed burning is the largest contributor of GHG emissions under the Program. Under this alternative, total GHG emissions per year would be less than 750 $MTCO_2e$[1] (see Section 4.7: Greenhouse Gas Emissions, Table 4.7-7) as compared with 10,174 $MTCO_2e$ generated by the Program as proposed. Carbon sequestration likely would not substantially change under this alternative as large trees are not affected by prescribed burns. Mostly understory and grasses are burned, and these areas could be treated manually or mechanically under this alternative.

Similar Environmental Impacts

Biological Resources

Potential impacts on rare plant and special-status wildlife species and sensitive natural communities may be slightly reduced under this alternative since prescribed burning would not occur. Most actions that have the potential for effects on plant and wildlife species (i.e., implementation of the VMP and infrastructure under the Wildland Fire Pre-Plans) would be performed in the same way under the Program as under this alternative. Impacts would be reduced to less than significant by the same mitigation as identified for the Program. Overall

habitat impacts may be greater than for the proposed Program in the long term with this alternative since the ecosystem resiliency and wildland fire hazard reduction benefits of prescribed burning would not be realized.

Cultural and Tribal Cultural Resources

Impacts on cultural resources and tribal cultural resources would be similar and potentially slightly reduced. While prescribed burning may result in a slightly lower potential to damage or destroy previously undiscovered historic and archaeological resources (buried resources) than mechanical removal, the likelihood is still so remote that the impact is relatively the same for both the Program and this alternative. Most impacts could occur from other manual and mechanical methods of vegetation removal across the Program area, and the same mitigation as identified for the rest of the Program activities would reduce impacts of this alternative on cultural and tribal cultural resources to less than significant.

Geology, Soils, and Hydrology

This alternative would reduce the area that could potentially be subject to erosion and sedimentation from prescribed fire. In both the Program and this alternative, vegetation would be removed under the VMP, and root strength could be affected, resulting in topsoil loss and erosion and subsequent sedimentation of waterways. Installation of infrastructure under the Wildland Fire Pre-Plan could also result in erosion and sedimentation. Mitigation to reduce impacts would be the same for the alternative as the Program to reduce impacts of the VMP and infrastructure under the Wildland Fire Pre-Plan. All other aspects of vegetation removal would be the same and would require the same mitigation to reduce impacts to less than significant.

Fire Hazards

Fire hazards would decrease slightly under this alternative. The safety hazard to the public and structures from proximity to prescribed burns would be avoided. Risks of wildland fire spread from loss of control of a prescribed burn would be avoided, although under the Program as proposed would be very remote and was found to be less than significant. Similar mitigation for risks from pile burning would reduce impacts to less than significant. The benefits of prescribed fire to reduce the potential severity of a wildland fire in the future (and reduce the potential severity of impacts of a wildland fire), should one occur, would not be realized.

Hazardous Materials

Accidental spills of hazardous materials would be slightly reduced as compared with the Program under this Alternative since prescribed burning would not occur. Hazardous spills or exposures from fuels and lubricants from prescribed burning would not occur. Impacts from exposure to hazardous materials from ground disturbance within the Almaden AFS would be the same under both the Program and the alternative as would exposures from implementation of the VMP and installation of infrastructure under the Wildland Fire Pre-Plan. Mitigation for the Program would also be applicable to this alternative to reduce impacts to less than significant.

Noise
Noise impacts would be somewhat reduced for this alternative since noise associated with prescribed burns would not occur. Noise impacts would be the same for the rest of the plans under the Program for this alternative and would be mitigated to less than significant by the same measures.

Recreation and Transportation
Recreational impacts and transportation impacts would be slightly reduced since trails and roads would not need to be closed without the PFP. Overall impacts on recreation and transportation would be very similar and would be mostly related to recreationalists' or vehicular safety when using the same trails and roads as heavy equipment under the VMP and Wildland Fire Pre-Plan. Mitigation defined for the Program would also mitigate significant impacts of this alternative to less than significant.

New or Greater Environmental Impacts
The overall ecosystem benefits of this alternative would be reduced as compared with those of the Program as evaluated under this Program EIR. While it is imperative to try to reduce the occurrences of catastrophic wildland fires, fire is necessary for the proper functioning of forest ecosystems. Fire is infinitely complex. It burns in a mosaic of different intensities depending on topography, weather conditions, type and amount of fuels, season, and other parameters. Mosaic patterns are natural and help create a heterogeneous forest of different age classes, successional stages, and species diversity. Fire in mixed-conifer forests, for example, recycles nutrients, prepares the seedbed for plants to regenerate, facilitates germination in some species, opens up the forest for pioneer species to establish, affects wildlife in numerous ways, creates a mosaic of habitats, and influences pest populations and disease development. While manual and mechanical methods of vegetation control can meet some of these goals, they do not replace the fire process that has evolved in the forest that has only been suppressed in the modern era (Forestland Steward, 2013). Interior areas of the OSPs may not be treated without the PFP, and as such, may experience larger effects if a wildland fire were to occur.

Conclusions
This alternative reduces two of the significant and unavoidable impacts associated with air quality and GHG emissions from the Program. Several other impacts would be somewhat reduced since prescribed fire would not be implemented, but would not be substantially reduced. The Program, which includes the PFP, provides more benefits to overall ecosystem health than this alternative, as carefully planned prescribed burning has benefits to soil health, plant regeneration, understory growth, and species diversity over time.

This alternative, notably, does not meet the second objective of integrating Native American traditional ecological knowledge practices related to prescribed fire. It would also limit the effectiveness of the Program towards meeting the first objective of managing vegetation to establish resilient ecosystems and the third objective of the Program regarding managing vegetation on Midpen lands to reduce the harmful effects of wildland fire on people, property, and natural and cultural resources. The VMP includes activities that would improve ecosystem

resiliency and reduce wildland fire hazards, but reintroducing prescribed fire would allow for meeting both objectives to a greater extent through preservation and enhancement of existing significant biological resources by mimicking lost or diminished ecosystem processes from fire and by reducing excess fuel over large areas of the landscape that could otherwise result in a more intensive and damaging wildland fire.

6.4.3 Reduced Program – Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management

Description of Alternative

Vegetation management under this alternative would focus on natural resources. The creation of ecosystem resiliency VMAs would be the same as for the proposed Program, but the total acreage of enhanced fire management VMAs (e.g., fuelbreaks) would be reduced. The size criteria used to establish the VMAs for enhanced fire management would be reduced under this alternative. Strikeout and underline are used to show the changes in the criteria for establishment of reduced VMAs for enhanced fire management, as compared with the Program:

a. Adjacent to or near existing or planned fuels treatment areas;
b. Identified by Midpen or other fire management or vegetation management professional staff as important areas for fuels treatment;
c. Up to ~~300~~ 100 feet from vulnerable populations (school, hospital, nursing home);
d. Up to 100 feet from existing occupied Midpen buildings;
e. Up to ~~200~~ 100 feet from emergency response infrastructure (communications tower, fire station, police station, medivac location, evacuation center, critical water infrastructure, such as storage tanks and pumps for fire suppression);
f. ~~Up to 200 feet from a designated expanded fire response/fire monitoring clearing zone (safety zone, parking area, staging area, helicopter landing zone, lookout);~~
g. Within ~~200~~ 100 feet of sensitive resources or other Midpen High Value Asset that would benefit from and/or respond favorably to treatment or at risk of loss in the event of a wildland fire;
h. Within ~~200~~ 100 feet of a designated Midpen evacuation route;
i. Within 10-25 feet (depending on flame length) of primary Midpen designated emergency access roads accessible by a Wildland Type 3 fire engine; and
j. ~~Areas that enhance the ability to efficiently conduct fire suppression by providing infrastructure (e.g. staging areas, disc lines) and ingress/egress of fire suppression equipment.~~

The total acreage of VMAs for enhanced fire management purposes under this reduced Program alternative has not been mapped or calculated but is expected to reduce the total acreage of VMAs for enhanced fire protection by at least 20 percent. The potential maximum acreages of VMAs for enhanced fire management could be reduced each year as shown in Table 6.4-2. Strikeout and underline are used to show the changes in maximum acreages treated, as compared with the Program.

Table 6.4-2 Maximum Annual Treatments under the Reduced Program – Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management

Activity	Treatment Type	Unit	Create New or Maintain Existing	Maximum Annual Treatments
Shaded Fuelbreaks	Manual, mechanical, herbicide, prescribed herbivory	Acre	New	~~50~~ 25
			Maintain	~~100~~ 50
Non-Shaded Fuelbreaks	Mechanical, herbicide, prescribed herbivory	Acre	New	5
			Maintain	80
Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	Manual, mechanical, herbicide, prescribed herbivory	Acre	New	~~400~~ 200
			Maintain	~~400~~ 200
Target Hazards Fuelbreaks	Manual, mechanical, herbicide, prescribed herbivory	Acre	New	20
			Maintain	20
Fire Agency New Recommended Fuelbreaks	Manual, mechanical, herbicide, prescribed herbivory	Acre	New	100
			Maintain	N/A
Ingress/Egress Route Fuelbreaks	Mechanical, herbicide, prescribed herbivory	Acre	New	25
			Maintain	25
Disclines	Mechanical, herbicide	Acre	New	10
			Maintain	60
Midpen Structures and Facilities Defensible Space	Manual, mechanical, herbicide	Acre	New	As needed
			Maintain	175
Fire Management Logistics Areas	Manual, mechanical	Acre	New	~~100~~ 50
			Maintain	~~30~~ 15
Eucalyptus and Acacia Removal	Manual, mechanical, herbicide	Acre	New	20
			Maintain	10
Fuel Reduction Areas	Manual, mechanical, herbicide, prescribed herbivory	Acre	New	500
			Maintain	500
Total			**New**	**~~1,230~~ 955 acres**
			Maintain	**~~1,400~~ 1,135 acres**

Notes:

Monitoring actions will be determined by Midpen staff annually. Prescribed burning units and maximum burns per year will be defined through development of the PFP.

Rationale for Full Analysis and Relationship to Program Objectives

This alternative is brought forward for full analysis because it would reduce impacts associated with more intensive vegetation management activities associated with the creation and maintenance of VMAs for enhanced fire management. The Program would reduce the total acreage of enhanced fire management VMAs as well as the total acreages treated per year, while still providing a program that balances fuel management areas and ecosystem resiliency areas. It is a feasible alternative and would reduce environmental impacts of the Program associated with creation and maintenance of various types of fuelbreaks and defensible spaces.

This alternative meets most of the objectives of the Program but is not as effective as the Program at meeting the third objective of the Program regarding managing vegetation infrastructure on Midpen lands to reduce the harmful effects of wildland fire on people, property, and natural resources.

Summary of Comparative Environmental Impacts

Overview

This alternative would reduce the extent of impacts associated with VMP activities for enhanced fire management, which are more intensive than creation of FRAs for ecosystem resiliency. Overall impacts for several parameters would be reduced each year and over the life of the Program. The primary potentially significant impact that would be lessened would be direct and indirect impacts to special status-species and sensitive natural communities, since less acreages would be subject to the intensive fuelbreak treatments. Visual impacts could also be lessened.

Lessened Impacts

Aesthetics

Visual impacts from fuelbreak creation would be lessened under this alternative by lessening the number of locations where fuelbreaks that degrade of scenic quality as viewed from scenic roads, trails, corridors, or viewpoints occur. While the number of locations where a significant visual impact could occur would be reduced, the impact would remain significant and unavoidable.

Other visual impacts would be similar to the Program, including from dust, and significant and unavoidable impacts from prescribed burning and from installation of infrastructure under the Wildland Fire Pre-Plans.

Biological Resources

Implementation of this alterative would reduce both annual and total potential impacts to rare plants, special-status species, and sensitive communities by reducing the total acreage of enhanced fire management VMAs. Impacts could still occur and the same mitigation as identified for the Program would remain applicable to reduce the potentially significant impacts to biological resources. The intensity of impacts is anticipated to be less, commensurate with the reduction in areas treated (assumed to be approximately 20 percent less). For example, potential impacts to all plant and wildlife species and sensitive habitats identified in Section 4.4:

Biological Resources could still occur, since all Program activities would still occur under this alternative. While the intensity or potential for impacts may be reduced, impacts could still be significant. Mitigation to reduce impacts to species would need to be applied but may need to be used less often since less acreage may be impacted.

Impacts to biological resources from all other actions (i.e., creation of FRAs, implementation of the PFP, installation of infrastructure) would be the same as for the Program, with the same mitigation applicable for reduction of impacts to less than significant.

Geology, Soils, and Hydrology

Potentially significant impacts associated with slope stability, erosion, and sedimentation from soils exposures and loss of root strength would be reduced under this alternative. Enhanced fire management VMAs, such as fuelbreaks have the greatest potential of the activities identified in the Program for creating slope instability from loss of root strength. The likelihood is not high, but by reducing the areas treated by approximately 20 percent, the total risks of soil impact would be reduced by a commensurate percentage. Impacts could still occur and would be reduced with the mitigation identified in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures. The impacts and mitigation for creation of ecosystem resiliency VMAs, implementation of the PFP, and for installation of new firefighting infrastructure under the Wildland Fire Pre-Plan would be the same as for the Program.

Similar Environmental Impacts

Air Quality and GHG Emissions

Air quality and GHG emissions would be similar to those described for the Program. Criteria pollutant emissions for fuelbreak work would be reduced by an amount commensurate with the reduction in activities associated with enhanced fire management VMA creation and maintenance, but these impacts were already less than significant for the Program, as shown in Section 4.3: Air Quality, Table 4.3-7 and Section 4.7: Greenhouse Gas Emissions, Table 4.7-7. The potentially significant air quality and GHG impacts of the Program are primarily caused by prescribed fire, which would be performed in the same manner under this alternative. The significant unavoidable impacts from prescribed fire would be the same as for the Program.

Cultural and Tribal Cultural Resources

Impacts on cultural resources would be similar, although potentially significant impacts to cultural and tribal cultural resources could be slightly reduced through a reduction in maximum fuelbreak creation and maintenance each year and over the life of the Program. Fuelbreak creation has some potential to impact known and previously undiscovered resources; however, the likelihood is small as many resources are not anticipated in these limited areas. The impact is relatively the same for both the Program and this alternative. All impacts identified for the Program could still occur and the same mitigation as identified in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures would also reduce impacts to cultural and tribal cultural resources from implementation of this alternative to less than significant.

Hazardous Materials and Wildland Fire
Potentially significant impacts associated with hazardous materials accidental spills and exposure would be similar, although slightly reduced for this alternative. The likelihood and severity of a spill is low, even for the Program, so a reduction in total acreages treated for enhanced fire management VMAs by approximately 20 percent would not substantially reduce the risks as compared with the Program. The same impacts and mitigation measures would apply as identified for the Program to reduce effects to less than significant. Impacts and mitigation associated with all other aspects of the Program (i.e., the ecosystem resiliency FRAs, the PFP, and installation of firefighting infrastructure under the Wildland Fire Pre-Plan) would be the same as for the Program.

Reducing the amount of people and equipment needed each year by reducing acreage treated by approximately 20 percent would reduce the potential for accidental ignition of wildland fire when conducting activities; however, risks would still occur from the remaining activities. The same mitigation would be required to minimize these risks as identified for the Program.

Noise
Noise impacts would be similar to the Program. While the total number of sensitive receptors that could be exposed to noise could be reduced with a reduced acreage of enhanced fire management VMAs being treated each year, similar noise impacts could occur, requiring implementation of the same mitigation to ensure no violations of local noise ordinances through excessive and unnecessary noise generation.

Recreation and Transportation
Recreation and transportation impacts would be similar to the Program. There would be some reduction in safety impacts and impacts associated with emergency access with less acreage treated per year. The other activities in the Program would still generate the same impacts and would require mitigation. Impacts are relatively minor across the program, such that a reduction in total acreages treated by 20 percent would not constitute a substantial lessening of the potential impacts.

New or Greater Environmental Impacts
Reducing the total acreage and number of enhanced fire management VMAs created would not result in any greater direct environmental impacts than for the Program. This alternative may have greater potential for effects to environmental resources if a wildland fire were to occur on Midpen lands, as compared with the Program. Enhanced fire management VMAs under the Program provide protection to ingress and egress routes, firefighting equipment and staging, and allow for more locations to fight a fire. Reducing these areas would reduce the overall effectiveness of the Program.

Conclusions
This alternative provides some degree of reduction of potentially significant impacts to aesthetic and biological resources and reductions to geologic and hydrologic impacts associated with slope instability, erosion, and sedimentation by reducing fuelbreak acreages by approximately

20 percent. Many other resource parameters would see some reductions in impacts, but reductions would be minor. In all cases, mitigation measures proposed for the Program would reduce potentially significant impacts to less than significant. Because this alternative includes the PFP, impacts from criteria pollutant emissions and GHGs would remain significant and unavoidable. Aesthetics impacts would also remain significant and unavoidable.

This alternative meets most of the objectives of the Program but is not as effective at meeting the third objective of the Program regarding managing vegetation on Midpen lands to reduce the harmful effects of wildland fire on people, property, and natural resources. Impacts to life and property, should a wildland fire occur, could be greater under this alternative than under the proposed Program due to the reduction in fuelbreaks in this alternative.

6.4.4 Reduced Program – No Acacia or Eucalyptus Removal and Limit Treatments in Sensitive Communities to Fuel Reduction Areas

Description of Alternative

This alternative would eliminate the acacia and eucalyptus removal and would include conducting FRA-level of work in sensitive communities identified in this Program EIR, instead of full intensity fuelbreaks in these communities.

The approximately 200 acres of eucalyptus and acacia that could be removed under the Program would be eliminated under this alternative. Annual grassland series would be mowed, similar to treatment under the Program (up to 788 acres). The list below identifies the number of acres of sensitive communities that would be treated with FRAs instead of more intensive enhanced fire management VMAs (i.e., fuelbreaks):

- Coastal scrub: Up to 112 acres
- Chaparral: Up to 76 acres
- Oak savanna: Up to 12 acres
- Hardwood forest: Up to 325 acres
- Conifer forest: Up to 85 acres
- Aquatic: Up to 4.6 acres

Enhanced fire management VMAs for these areas under the Program include fuelbreaks, shaded fuelbreaks, disclines, and defensible space. Converting treatment to FRAs would significantly reduce the intensity of treatments and would eliminate disclines in these communities.

The total acreages treated per year would remain the same as for the Program; however, annual FRA treatments and maintenance would increase in the same proportion as the decrease in the enhanced fire management VMA treatments and maintenance.

Rationale for Full Analysis and Relationship to Program Objectives

This alternative is brought forward for full analysis because it would reduce potentially significant aesthetic and erosion impacts. It would also reduce potential impacts to sensitive

butterfly and avian species by leaving potential nesting habitat, and would reduce impacts to sensitive communities by reducing the intensity of vegetation removal and treatments in these communities.

This alternative is feasible and meets most of the objectives of the Program. This alternative is not, however, as effective at meeting the third objective of the Program regarding managing vegetation (including invasive, fire prone trees) on Midpen lands to reduce the harmful effects of wildland fire on people, property, and natural and cultural resources. Eucalyptus trees can carry fire long distances through wind-blown embers, are believed to be combustible, and create extensive dead leaf and branch matter that is also highly combustible. Acacias are also fire prone invasive species that create extensive, combustible debris. Leaving these invasive fire prone trees would make the Program less effective at reducing wildland fire hazards. Reducing the intensity of treatments in sensitive communities may also reduce the effectiveness of the alternative at meeting the third Program objective to reduce wildland fire hazards and resultant effects on property, and natural and cultural resources. Enhanced fire management VMAs may not function optimally where treatment intensity is reduced to the level of an FRA, particularly near ingress and egress routes and in defensible space.

Summary of Comparative Environmental Impacts

Lessened Environmental Impacts

Aesthetics

Significant visual impacts from enhanced fire management VMAs would be lessened under this alternative by avoiding the potentially significant and unavoidable impacts of removal of eucalyptus groves in areas, and by reducing the intensity of fuelbreak treatments in some habitat types (i.e., sensitive plant communities). Other visual impacts would be similar to the Program. Significant visual impacts from creation of fuelbreaks outside of sensitive communities, from prescribed burning, and from installation of new infrastructure would remain significant and unavoidable under this alternative.

Biological Resources

Potentially significant impacts to sensitive communities would be substantially reduced under this alternative. FRAs would be designed to minimize effects to sensitive natural communities where fuel treatments would occur in these communities. The need for compensatory mitigation for treatments in sensitive communities would be avoided. Similarly, impacts to special-status wildlife and plants that could occur in these communities would be reduced by decreasing the intensity of vegetation treatment and tree removal. Potentially significant impacts to monarch butterflies and nesting birds would be reduced by eliminating removal of acacia and eucalyptus from the Program. The same mitigation as identified for the Program would apply to this alternative to reduce other remaining impacts to less than significant.

Geology, Soils, and Hydrology

Potentially significant impacts associated with slope stability, erosion, and sedimentation from soils exposures and loss of root strength would be reduced under this alternative. Enhanced fire management VMAs, such as fuelbreaks, have the greatest potential of the activities identified in

the Program for creating slope instability from loss of root strength. Reducing the intensity of treatments in sensitive communities would reduce the potential for these impacts.

Impacts could still occur and would be reduced with the mitigation identified in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures. The remaining impacts and mitigation for creation of ecosystem resiliency VMAs, implementation of the PFP, and for installation of new firefighting infrastructure under the Wildland Fire Pre-Plan would be the same as for the Program.

Similar Environmental Impacts

Air Quality and GHG Emissions

Air quality and GHG emissions would be similar to those described for the Program as similar acreages would be treated per year as identified for the Program. Criteria pollutant emissions would be somewhat reduced by converting enhanced fire management VMA creation and maintenance in sensitive communities to FRAs that involve less intensive vegetation management, but these impacts were already less than significant for the Program, as shown in Section 4.3: Air Quality, Table 4.3-7 and Section 4.7: Greenhouse Gas Emissions, Table 4.7-7. The potentially significant air quality and GHG impacts of the Program are primarily caused by prescribed fire, which would be performed in the same manner under this alternative. The significant unavoidable impacts would be the same as for the Program.

Cultural and Tribal Cultural Resources

Impacts on cultural resources would be similar, although potentially significant impacts to cultural and tribal cultural resources could be slightly reduced through a reduction in intensive treatments in sensitive natural communities. The same total areas of treatments would occur, and thus, the potential for impacts would be similar to the Program. All impacts identified for the Program could still occur and the same mitigation as identified in Chapter 4: Environmental Setting, Impacts, and Mitigation Measures would also reduce impacts to cultural and tribal cultural resources from implementation of this alternative to less than significant.

Hazardous Materials and Wildland Fire

Potentially significant impacts associated with hazardous materials accidental spills and exposure would be similar for this alternative. The likelihood and severity of a spill is low, even for the Program, so a reduction in intensity of treatments in sensitive natural communities would not substantially reduce the risks as compared with the Program. The same impacts and mitigation measures would apply as for the Program to reduce effects to less than significant. Impacts and mitigation associated with all other aspects of the Program (i.e., the ecosystem resiliency FRAs, the PFP, and installation of firefighting infrastructure under the Wildland Fire Pre-Plan) would be the same as for the Program.

Reducing the intensity of treatments in sensitive natural communities and eliminating eucalyptus and acacia removal would slightly reduce the potential for accidental ignition of wildland fire when conducting activities; however, risks would still occur from the remaining

activities. The same mitigation would be required to minimize these risks as identified for the Program.

Noise

Noise impacts would be similar to the Program. While the duration that sensitive receptors exposed to noise could be reduced with a conversion of enhanced fire management VMAs in sensitive communities to FRAs, similar noise impacts could occur, requiring implementation of the same mitigation to ensure no violations of local noise ordinances through excessive and unnecessary noise generation.

Recreation and Transportation

Recreation and transportation impacts would be similar to the Program as the same total acreages and areas would be treated. There would be some reduction in safety impacts and impacts associated with emergency access by not removing acacia or eucalyptus and reducing intensity of treatments in sensitive natural communities. The other activities in the Program, however, would still generate the same impacts requiring mitigation. Impacts are relatively minor across the Program, such that a reduction in some intensity of treatments would not constitute a substantial lessening of the potential impacts.

New or Greater Environmental Impacts

Reducing the total enhanced fire management VMAs by converting them into FRAs in sensitive natural communities would reduce their effectiveness, and thus result in a greater potential for effects to life and property if a wildland fire were to occur on Midpen lands, as compared with the Program. The enhanced fire management VMAs provide protection to ingress and egress routes, firefighting equipment and staging, and allow for more locations to fight a fire. Reducing the intensity of treatments in these areas would reduce the overall effectiveness of the alternative as compared with the Program. Leaving eucalyptus and acacia could also increase fire risks as compared with the Program, due to general higher flammability of eucalyptus. As invasive trees, removal under the Program provides benefits to ecological resiliency and native habitat (consistent with the Midpen's RM Policies). These benefits would not be realized under this alternative.

Conclusions

This alternative provides reductions to potentially significant impacts to biological resources and reductions to geologic and hydrologic impacts associated with slope instability, erosion, to visual impacts, and from sedimentation by reducing intensities of treatments in sensitive natural communities and by not removing acacia and eucalyptus. Many other resource parameters would see some reductions in impacts, but reductions would be minor. Mitigation as proposed for the Program would reduce potentially significant impacts to less than significant for this alternative. This alternative includes the PFP, and as such, impacts from criterial pollutant emissions and GHGs would remain significant and unavoidable, as would some visual impacts.

This alternative meets most of the objectives of the Program but is not as effective at meeting the third objective of the Program regarding managing vegetation infrastructure on Midpen lands to reduce the harmful effects of wildland fire on people, property, and natural resources, including elimination of some disclines and defensible space treatments where they would occur in sensitive natural communities. Enhanced fire management VMAs may not function optimally where treatment intensity is reduced to the level of an FRA, particularly near ingress and egress routes and in defensible space. As a result, if a wildland fire were to occur, the effects of that fire could be more severe under this alternative than if the Program as proposed were implemented.

6.5 Comparison of Alternatives

Table 6.5-1 includes a summary comparing the Program and the three alternatives by each impact statement within Chapter 4: Environmental Setting, Impacts, and Mitigation Measures of this Program EIR.

Table 6.5-1 Comparison of Alternatives

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
Impact Aesthetics-1: The proposed Program could have a substantial adverse effect on a scenic vista, or substantially degrade the existing visual character or quality of public views of the site and its surroundings.	Potentially significant	Potentially significant and unavoidable	Temporary degradation of public views from implementation of vegetation management activities would be avoided. Similar to the Program for installation of firefighting infrastructure may be significant.	Reduced impacts from no prescribed burning, with overall impacts remaining significant and unavoidable.	Reduced impacts from reducing the total acreage of enhanced fire management VMAs, with overall impacts remaining significant and unavoidable.	Reduced impacts from elimination of acacia or eucalyptus removal and reduced intensity of vegetation management in sensitive natural communities, with overall impacts remaining significant and unavoidable.
Impact Aesthetics-2: The proposed Program could substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	Less than significant	N/A	No impact	Slightly reduced impacts from no prescribed burning and less than significant.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs and less than significant.	Slightly reduced impacts from elimination of acacia or eucalyptus removal and reduced intensity of vegetation management in sensitive natural communities, less than significant.
Impact Aesthetics-3: The proposed Program could create a new source of substantial light or glare that	Less than significant	N/A	Similar to the Program for installation of firefighting	Slightly reduced impacts from no prescribed	Similar to the Program and less than significant.	Similar to the Program and less than significant.

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
would adversely affect day or nighttime views in the area.			infrastructure and less than significant.	burning and less than significant.		
Impact Air Quality-1: The proposed Program could conflict with or obstruct implementation of the applicable air quality plan.	Potentially significant	Potentially Significant and unavoidable	Less than significant because of no prescribed burning.	Less than significant because of no prescribed burning.	Significant and unavoidable because of prescribed burning, similar to the Program.	Significant and unavoidable because of prescribed burning, similar to the Program.
Impact Air Quality-2: The proposed Program could result in a cumulatively considerable net increase of any criteria pollutant for which the program region is non-attainment under an applicable federal or state ambient air quality standard.	Potentially significant	Potentially Significant and unavoidable	Less than significant because of no prescribed burning.	Less than significant because of no prescribed burning.	Significant and unavoidable because of prescribed burning, similar to the Program.	Significant and unavoidable because of prescribed burning, similar to the Program.
Impact Air Quality-3: The proposed Program could expose sensitive receptors to substantial pollutant concentrations.	Potentially significant	Potentially Significant and unavoidable	Less than significant because of no prescribed burning.	Less than significant because of no prescribed burning.	Similar to the Program and significant and unavoidable.	Slightly reduced impact from reduced intensity of vegetation management in sensitive natural communities, but significant and unavoidable.
Impact Air Quality-4: The proposed Program could result in other	Potentially significant	Potentially significant	Less than significant	Less than significant	Similar to the Program and	Slightly reduced impact from and reduced

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
emissions (such as those leading to odors) adversely affecting a substantial number of people.		and unavoidable	because of no prescribed burning.	because of no prescribed burning.	significant and unavoidable.	intensity of vegetation management in sensitive natural communities, but significant and unavoidable.
Impact Biological Resources-1: The proposed Program could have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Reduced intensity of impacts from reducing the total acreage of enhanced fire management VMAs but less than significant with mitigation.	Reduced impacts from elimination of acacia and eucalyptus removal and reduced intensity of vegetation management in sensitive natural communities, but less than significant with mitigation.
Impact Biological Resources-2: The proposed Program could have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS, or State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal,	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Reduced intensity of impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Less than significant from elimination of acacia and eucalyptus removal and only FRA-level work in sensitive natural communities.

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
filling, hydrological interruption, or other means.						
Impact Biological Resources-3: The proposed Program could interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Reduced intensity of impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Reduced impacts from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Biological Resources-4: The proposed Program could conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, or adopted HCP, Natural Community Conservation Plan (NCCP), or other approved local, regional, or State HCP.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Reduced intensity of impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Reduced impacts from elimination of acacia and eucalyptus removal, but less than significant with mitigation.
Impact Cultural Resources-1: The proposed Program could cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to CEQA Guidelines Section 15064.5.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less	Slightly reduced impact from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, but less

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
					than significant with mitigation.	than significant with mitigation.
Impact Cultural Resources-2: The proposed Program could disturb human remains, including those interred outside of formal cemeteries.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Slightly reduced impacts from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Cultural Resources-3: The proposed Program could cause a substantial adverse change in the significance of a tribal cultural resource that is listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC § 5020.1(k); or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC § 5024.1.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Slightly reduced impact from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
Impact Geology and Soils-1: The proposed Program could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; ii) Strong seismic ground shaking; iii) Seismic-related ground failure, including liquefaction; or iv) Landslides.	Less than significant	N/A	Similar to the Program for installation of infrastructure and less than significant.	Reduced impacts from no prescribed burning and less than significant.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs and less than significant.	Slightly reduced impacts from elimination of acacia and eucalyptus removal, and less intensive vegetation management for FRAs, and less than significant.
Impact Geology and Soils-2: The proposed Program could result in substantial soil erosion or the loss of topsoil.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Reduced impacts from no prescribed burning, but less than significant with mitigation.	Reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Reduced impacts from elimination of acacia and eucalyptus removal, and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Geology and Soils-3: The proposed Program could be located on a geologic unit or soil that is unstable, or that would become	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and	Reduced impacts from no prescribed burning, but less	Reduced impacts from reducing the total acreage of enhanced fire	Reduced impacts from elimination of acacia and eucalyptus removal and only FRA-level work in

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
unstable as a result of the proposed plan, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.			less than significant with mitigation.	than significant with mitigation.	management VMAs, but less than significant with mitigation.	sensitivity natural communities, but less than significant with mitigation.
Impact Geology and Soils-4: The proposed Program could be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), or a corrosive soil creating substantial direct or indirect risks to life or property.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Reduced impacts from no prescribed burning, but less than significant with mitigation.	Reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Reduced impacts from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Geology and Soils-5: The proposed Program area could have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.	No impact	N/A	No impact	No impact	No impact	No impact
Impact Geology and Soils-6: The proposed Program could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Less than significant	N/A	Similar to the Program for installation of infrastructure and less than significant.	Same impacts and less than significant	Reduced impacts from reducing the total acreage of enhanced fire management VMAs and less than significant.	Reduced impacts from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, and less than significant.

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
Impact GHG-1: The proposed Program could generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	Potentially significant	Potentially significant and unavoidable	Less than significant because of no prescribed burning.	Less than significant because of no prescribed burning.	Significant and unavoidable because of prescribed burning, similar to Program.	Significant and unavoidable because of prescribed burning, similar to Program.
Impact GHG-2: The proposed Program could conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.	Less than significant	N/A	Less than significant because of no prescribed burning.	Less than significant because of no prescribed burning.	Similar to Program and less than significant.	Similar to Program and less than significant.
Impact Hazards-1: The proposed Program could create a significant hazard to the public or the environment through emission of or exposure to hazardous materials.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Slightly reduced impacts from elimination of acacia and eucalyptus removal, and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Hazards-2: The proposed Program could be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Similar to the Program and less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less	Similar to the Program and less than significant with mitigation.

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
hazard to the public or the environment.					than significant with mitigation.	
Impact Hazards-3: For a proposed Program located within an area covered by an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the Program area.	No impact	N/A	No impact	No impact	No impact	No impact
Impact Hazards-4: The proposed Program could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Similar to the Program and less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Similar to the Program and less than significant with mitigation.
Impact Hazards-5: The proposed Program could expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Slightly reduced impacts from no prescribed burn, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less	Slightly reduced impacts from elimination of acacia or eucalyptus removal and only FRA-level work in sensitivity natural communities, but less

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
					than significant with mitigation.	than significant with mitigation.
Impact Hazards-6: Due to slope, prevailing winds, and other factors, the proposed Program could exacerbate wildland fire risks, and thereby expose project occupants to pollutant concentrations from a wildland fire or the uncontrolled spread of a wildland fire.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Slightly reduced impacts from no prescribed burn, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Slightly reduced impacts from elimination of acacia or eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Hazards-7: The proposed Program could require the installation or maintenance of associated infrastructure (such as roads, fuelbreaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Similar to the Program and less than significant with mitigation.	Similar to the Program and less than significant with mitigation.	Similar to the Program and less than significant with mitigation.
Impact Hazards-8: The proposed Program could expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant	Slightly reduced impacts from no prescribed burn, but less than significant with mitigation	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less	Reduced impacts from elimination of acacia or eucalyptus removal and only FRA-level work in sensitivity natural communities, but less

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
					than significant with mitigation	than significant with mitigation.
Impact Hydrology-1: The proposed Program could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality, or substantially alter the existing drainage pattern of the area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on or off site.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Slightly reduced impacts from no prescribed burn, but less than significant with mitigation.	Reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Reduced impacts from elimination of acacia and eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Hydrology-2: The proposed Program could substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Program may impede sustainable groundwater management of the basin.	Less than significant	N/A	Similar to the Program and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.
Impact Hydrology-3: The proposed Program could substantially alter the existing drainage pattern of the site or area, including through the	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and	Slightly reduced impacts from no prescribed burning, but less	Reduced impacts from reducing the total acreage of enhanced fire	Reduced impacts from elimination of acacia and eucalyptus removal, and only FRA-level work in

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alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; ii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iii) impede or redirect flood flows.			less than significant with mitigation.	than significant with mitigation.	management VMAs, but less than significant with mitigation.	sensitivity natural communities, but less than significant with mitigation.
Impact Hydrology-4: The proposed Program could risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones.	Less than significant	N/A	Similar to the Program for installation of infrastructure and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.
Impact Hydrology-5: The proposed Program could conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Slightly reduced impacts from no prescribed burn, but less than significant with mitigation.	Reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less	Reduced impacts from elimination of acacia and eucalyptus removal, and only FRA-level work in sensitivity natural communities, but less

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
					than significant with mitigation	than significant with mitigation.
Impact Noise-1: The proposed program could result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the program in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation	Reduced impacts from no prescribed burning, but less than significant with mitigation.	Similar to the Program and less than significant with mitigation.	Similar to the Program and less than significant with mitigation.
Impact Noise-2: The proposed program could result in generation of excessive groundborne vibration or groundborne noise levels.	Less than significant	N/A	Similar to the Program for installation of infrastructure and less than significant.	Reduced impacts from no prescribed burn and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.
Impact Noise-3: For a program located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, the proposed program could expose people residing or working in the project area to excessive noise levels.	No impact	N/A	No impact	No impact	No impact	No impact

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
Impact Recreation-1: The proposed Program could increase the use of existing recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated or necessitate construction or expansion of recreational facilities.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation	Slightly reduced impacts from elimination of acacia or eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation
Impact Transportation-1: The proposed Program could substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) or conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant	Slightly reduced impacts from no prescribed burn, but less than significant with mitigation	Slightly reduced impacts from reducing the total acreage of enhanced fire management VMAs, but less than significant with mitigation.	Slightly reduced impacts from elimination of acacia or eucalyptus removal and only FRA-level work in sensitivity natural communities, but less than significant with mitigation.
Impact Transportation-2: The proposed Program could conflict with or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).	Less than significant	N/A	Similar to the Program and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.	Similar to the Program and less than significant.

Impact Description	Program		No Program Alternative[a, b]	No Prescribed Fire Plan Alternative	Reduced Program - Reduced Acreages of Vegetation Management Areas for Enhanced Fire Management	Reduced Program - No Acacia or Eucalyptus and Limit Treatments in Sensitive Communities to Fuel Reduction Areas
	Before Mitigation	After Mitigation				
Impact Transportation-3: The proposed Program could result in inadequate emergency access.	Potentially significant	Less than significant	Similar to the Program for installation of infrastructure and less than significant with mitigation.	Slightly reduced impacts from no prescribed burning, but less than significant with mitigation.	Similar to the Program and less than significant with mitigation.	Similar to the Program and less than significant with mitigation.

Notes:

[a] CEQA reviews would be conducted on an individual basis for firefighting infrastructure. The anticipated effects of similar types of firefighting infrastructure as those analyzed under the Program are assumed for the comparative analysis.

[b] The comparison under the No Program Alternative is focused on direct effects avoided by not implementing the proposed Program or the action alternative. Should a wildland fire occur, impacts to many resources would likely be greater under the No Program Alternative than they would be should a wildland fire occur on treated areas under the proposed Program. The potentially increased impacts of wildland fire on untreated lands are described in Section 6.4.1

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6.6 Environmentally Superior Alternative

CEQA requires the identification of the environmentally superior alternative among the alternatives to the Program that were evaluated in detail, or, to identify if the Program is environmentally superior to the alternatives. The environmentally superior alternative must be an alternative to the Program that reduces some of the environmental impacts of the Program, regardless of the financial costs associated with the alternative, otherwise the Program could be determined to be environmentally superior. Identification of the environmentally superior alternative is an informational procedure. The alternative identified as the environmentally superior alternative may not be that which best meets the goals or needs of the Program. Determination of the environmentally superior alternative does not preclude the Program or the other alternatives from being selected for implementation. The lead agency may adopt a statement of overriding considerations, which expresses the agency's views on the merits of approving a program despite its significant adverse environmental impacts. The statement of overriding considerations provides the justification for proceeding with a program despite its environmental impacts. The statement reflects the balancing of competing public objectives including factors such as environmental concerns, legal issues, technical, social, and economic factors.

The No Prescribed Fire Plan Alternative is environmentally superior by eliminating the significant and unavoidable impact on air quality and GHG emissions, although the significant and unavoidable impact on scenic resources would remain. The potential for a prescribed fire to become out of control and the risk to the public and structures from prescribed burns would also be eliminated, although these risks are very small given the controls and safety measures incorporated in practice into prescribed fires. This alternative, notably, does not meet the second objective of integrating Native American traditional ecological knowledge practices related to prescribed fire. It would also limit the effectiveness of the Program towards meeting the first objective of managing vegetation to establish resilient ecosystems and the third objective of reducing wildland fire risks to reduce the harmful effects off wildland fire on people, property, and natural resources. The VMP includes activities that would improve ecosystem resiliency, and reintroducing prescribed fire would meet this objective to a greater extent through mimicking lost or diminished ecosystem processes from fire to preserve and enhance existing significant biological resources. Prescribed fire would also reduce excess fuel over large areas of the landscape that could otherwise result in a more intensive and damaging wildland fire.

Prescribed burning is becoming an important tool for land managers to address fuel loading and habitat enhancement. The emissions and carbon release from prescribed burning in areas of a natural landscape under controlled conditions would be considerably less than the emissions released if the area were subject to a wildland fire. If a wildland fire were to occur on Midpen lands, the air quality impacts are expected to be much greater under a scenario where no treatment or reduced treatments are implemented, or where prescribed burning is not implemented, than if the proposed Program were implemented. When comparing impacts from

a wildland fire to prescribed burning, a greater quantity of carbon is lost per acre and higher particulate matter emissions rates occur in a wildland fire. Wildland fires typically burn an order of magnitude more land than any prescribed burning effort would undertake at one time (CARB, 2017d; Liu, et al., 2017). In general, two to four times more fuel is consumed during a wildland fire compared to a prescribed fire (Ottmar, 2013). During a wildland fire, fuels are generally drier, tree crowns are typically ignited, much or all of the fuel load present in an area (including live vegetation) may be consumed, and ignition generally occurs during very windy periods. Prescribed burns, however, are low intensity fires that burn less of the fuel load available, typically dead, and low-lying vegetation. Regular, low-intensity prescribed burns can reduce fuel loads that could otherwise contribute to the intensity and spread of a wildland fire (CNRA, 2018), even though prescribed burns also have emissions. It is expected that a wildland fire on Midpen lands would have many times greater criteria pollutant and GHG emissions than prescribed burning and would likely burn a larger area, due to the uncontrolled nature of wildland fires. Although the total emissions from pre-treatment and prescribed burn activities, in addition to a post-treatment wildland fire may be equivalent to a wildland fire ignited prior to treatment, based on modeling, the avoidance of a catastrophic wildland fire reduces human exposure to air pollutants. This is primarily because prescribed burning is conducted during optimal weather conditions to limit smoke and air quality impacts on nearby communities (Hyde & Strand, 2019).

The benefits of prescribed burning may outweigh the cost of temporary but significant and unavoidable emissions during the burn.

7 Document Preparation

7.1 Report Preparation

This section lists those individuals who either prepared or participated in the preparation of this Program EIR.

7.1.1 Midpeninsula Regional Open Space District

Midpen was the CEQA lead agency for preparation of this Program EIR. The following individuals listed in Table 7.1-1 were involved in the preparation of this Program EIR.

Table 7.1-1 Midpeninsula Regional Open Space District Team

Contributor	Title
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Aaron Peth	Planner III
Ana Ruiz	General Manager
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Julie Andersen	Senior Resource Management Specialist
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Meredith Manning	Senior Planner
Michael Gorman	Area Manager
Michael Jurich	Land and Facilities Manager (Retired)
Nathan Greig	Data Analyst II

7.1.2 Consultant Team

Panorama Environmental, Inc., prepared this Program EIR for and under the direction of Midpen. The following staff listed in Table 7.1-2 contributed to this Program EIR.

Table 7.1-2 Consultant Team

Contributor	Title	Role/Resource Section
Tania Treis	Project Manager	Project Management, Quality Control/Document Review and Revision of all Resource Sections, Project Description, Alternatives
Caitlin Gilleran	Deputy Project Manager	Project Description, Aesthetics, Air Quality, Biological Resources, Energy Use, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Noise, Recreation, Transportation
Rita Wilke	Senior Environmental Scientist	Hydrology and Water Quality, Geology and Soils, Other CEQA Considerations
Whitney Broeking	Senior Environmental Scientist	Cumulative Impacts, Technical Editing
Corey Fong	GIS Specialist/ Cartographer	GIS, Graphics
Madeleine Jones	Environmental Analyst	Cultural/Tribal Cultural Resources, Geology and Soils, Hydrology and Water Quality, Cumulative Impacts, Document Production, Technical Editing
Kathleen Cuschieri	Environmental Analyst	Technical Editing
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Carol Rice	Fire Management Specialist	Pile and Prescribed Burn Modeling

Subconsultant Authors

The following subconsultants listed in Table 7.1-3 contributed to the preparation of the Program EIR.

Table 7.1-3 Subconsultants

Contributor	Firm	Resource Section Support
Mike Ratte	RCH Group Rancho Cordova, California	Air Quality, Greenhouse Gas Emissions
Heath Bartosh	Nomad Ecology Martinez, California	Biological Resources
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Melody Tannam	Basin Research Associates San Leandro, California	Cultural Resources, Tribal Cultural Resources
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7.2 Agencies, Organizations, and Tribes Consulted

The following parties and agency representatives listed in Table 7.2-1 were contacted during preparation of this Program EIR.

Table 7.2-1 Parties Consulted During Preparation of Program EIR

Parties Consulted	
Agencies and Organizations	
• California Air Resources Board • California Coastal Commission (North Central Coast and Central Coast District) • California Department of Conservation • California Department of Fish and Wildlife Region 3 • California Department of Food and Agriculture • California Department of Forestry and Fire Protection • California Department of Parks and Recreation • California Department of Pesticide Regulation • California Department of Toxic Substances Control	• California Department of Transportation District 4 & 5 • California Highway Patrol • California Native American Heritage Commission • California Natural Resources Agency • California Regional Water Quality Control Board Regions 2 & 3 • California State Water Resources Control Board • National Oceanic and Atmospheric Administration • United States Army Corps of Engineers • United States Fish and Wildlife Service
Tribes	
• Amah Mutsun Tribal Band • Amah Mutsun Tribal Band of Mission San Juan Bautista • Costanoan Ohlone Rumsen-Mutsun Tribe • Costanoan Rumsen Carmel Tribe	• Indian Canyon Mutsun Band of Costanoan • Muwekma Ohlone Indian Tribe of the San Francisco Bay Area • North Valley Yokuts Tribe • Ohlone Indian Tribe

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APPENDICES

Appendix 1.0-1	Notice of Preparation
Appendix 1.0-2	Glossary of Terms
Appendix 3.0-1	Vegetation Management Maps
Appendix 3.0-2	Applicable Best Management Practices
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APPENDIX 1.0-1 NOTICE OF PREPARATION

Notice of Preparation

Midpeninsula Regional Open Space District

Wildland Fire Resiliency Program

San Mateo, Santa Clara, and Santa Cruz Counties, California

Date:	April 27, 2020
To:	Agencies and Interested Parties
From:	Midpeninsula Regional Open Space District
Subject:	Notice of Preparation of a Draft Program Environmental Impact Report for the Proposed Wildland Fire Resiliency Program
Review Period:	April 27, 2020 to May 28, 2020

Introduction

The Midpeninsula Regional Open Space District (Midpen) is initiating the process of preparing a Program Environmental Impact Report (EIR) for the Wildland Fire Resiliency Program (Program) to satisfy the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.). Midpen will serve as the lead agency for CEQA compliance.

In accordance with the State CEQA Guidelines (Title 14 California Code of Regulations [CCR] Section 15082), Midpen has prepared this Notice of Preparation (NOP) to inform agencies and interested parties that a Program EIR will be prepared for the above-referenced project. The purpose of a NOP is to provide sufficient information about a project and its potential environmental impacts to allow agencies and interested parties the opportunity to provide a meaningful response related to the scope and content of the EIR, including mitigation measures that should be considered and alternatives that should be addressed (14 CCR Section 15082[b]). Midpen is currently gathering public input regarding the scope of the Program EIR.

Midpen will hold a public scoping meeting on May 13, 2020. Invitations to the scoping meeting will be sent to all recipients of this NOP. Midpen appreciates scoping input from public agencies and individuals in response to this NOP and to the scoping meeting. The Program information, as well as Midpen contact information, are provided below.

Program Information

Title

Wildland Fire Resiliency Program

Lead Agency and Address

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022
(650)-691-1200

Contact

Coty Sifuentes-Winter, Senior Resource Management Specialist
csifuentes@openspace.org

Location

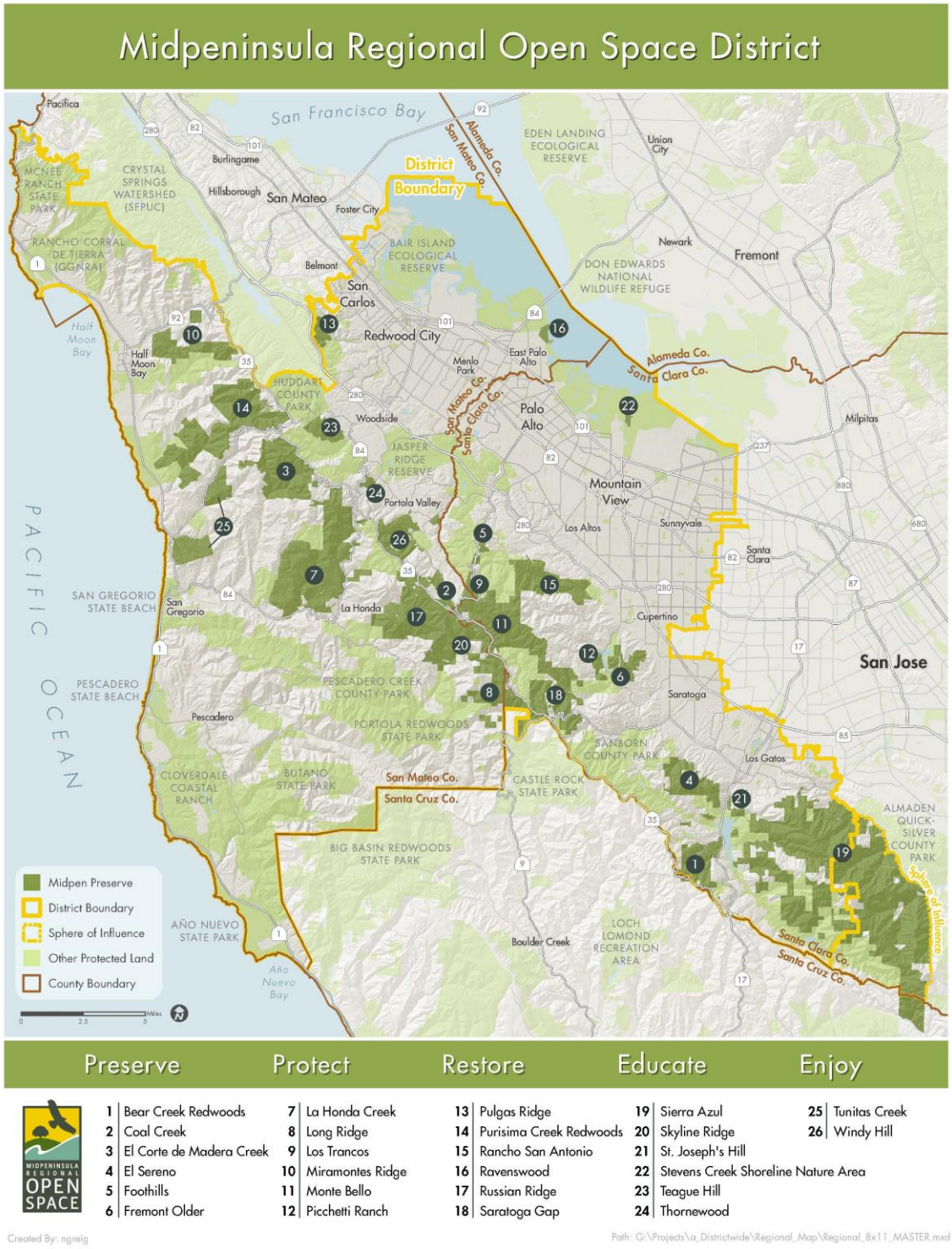
The actions under the Program would be applied on all Midpen's open space preserves (OSP) and other areas under Midpen management (collectively referred to as "Midpen lands"). Midpen is located along the western edge of the North American continent on a geologically active peninsula between the Pacific Ocean and San Francisco Bay, which limits migration of plants and animals. This unique location is contained within the Santa Cruz Mountain region. The region's Mediterranean climate is comprised of mild wet winters and long, hot, and dry summers cooled by cyclical coastal fog. Midpen's boundary extends along the San Francisco Bay from San Carlos to Los Gatos and along the Pacific coast from south of Pacifica to the Santa Cruz County line. Midpen lands permanently protect wildlife habitat, natural resources, watersheds, and a variety of ecosystems, as shown in Figure 1.

Program Setting

Midpen Lands and Recreational Resources

Midpen's purpose is to create a regional greenbelt of public open space lands to permanently protect natural resources and to provide for public use and enjoyment. In addition, through the Coastal Protection Area Service Plan, Midpen is committed to protecting coastal watershed and agricultural lands and preserving the rural character of the region. Midpen has preserved nearly 65,000 acres of open space lands, of which Midpen manages nearly 59,000 acres across 26 OSPs and through management agreements (e.g., Rancho San Antonio County Park). The remaining acreage that was preserved through Midpen action is managed by other entities. Each OSP ranges from 55 to over 18,000 acres. Of the total 26 OSPs, 24 are open to the public, 365 days a year from sunrise to one-half hour after sunset. The preserves are primarily visited for recreational and educational uses. Some preserves are leased for conservation grazing. There are a variety of rural residential and agricultural structures dispersed within preserves. Within the OSPs, there are over 240 miles of trails for hiking, mountain biking, nature study, and dog walking, as well as historical and cultural artifacts, horse stables and barns, a backpack campsite, scenic viewpoints, and picnic tables and benches. District visitor use regulations prohibit activities that can spark fires including possession of firearms, smoking, open campfires, and off-road vehicle use.

FIGURE 1 MIDPENINSULA REGIONAL OPEN SPACE DISTRICT OSPS AND OTHER MANAGED LANDS



Natural Resources

Located within the California Floristic Province (one of 25 internationally recognized biological hotspots), Midpen lands are rich with natural resources. Habitats found within OSPs include forested lands, grasslands, shrublands, and woodlands. Midpen lands include redwood, oak, and fir forests, chaparral-covered hillsides, riparian corridors, grasslands, and wetlands along the San Francisco Bay. Biological resources of special significance or importance, including species and habitats currently known to occur and those currently listed as sensitive or special-status by resource agencies, are found throughout Midpen lands.

Nearby Communities

Midpen's jurisdictional boundary encompasses 17 cities (Atherton, Cupertino, East Palo Alto, Half Moon Bay, Los Altos, Los Altos Hills, Los Gatos, Menlo Park, Monte Sereno, Mountain View, Palo Alto, Portola Valley, Redwood City, San Carlos, Saratoga, Sunnyvale, and Woodside) and unincorporated areas in San Mateo, Santa Clara, and northern Santa Cruz counties with a combined population of over 700,000 residents. Although use within the OSPs is primarily ecologically sensitive outdoor recreation, many of the OSPs abut low-density residential development in addition to open space owned and maintained by various agencies.

According to CALFIRE, almost 95 percent of fires in California are started by people. Many nearby communities lie within the wildland-urban interface (WUI); the area where structures meet or intermingle with undeveloped wildland vegetation. The WUI is thus an area of high human-environment interactions, and a potential source of fire ignition where fires can spread into wildland areas and impact homes located in the WUI. The majority of the WUI along the OSPs has a California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone rating of "High" or "Very High". The Program includes priority areas identified by Community Wildfire Protection Plans for fuel reduction at multiple OSPs.

Fire management enhancements on Midpen lands reduce the potential for catastrophic wildfires, as well as:

- Protect sensitive natural resources and habitat from long-lasting damage and loss;
- Benefit the local communities in the WUI by providing fuelbreaks and aiding fire suppression activities for emergency response to wildland fires; and
- Protect residents living further away and downwind who may be significantly affected by smoke and impacts to air quality within the larger Bay Area region.

Current Midpen Fuels Management Practices

Midpen undertakes several actions and activities on their lands to prepare for fire season. The actions related to fuel maintenance and reduction and fire management include:

- Maintaining existing fuelbreaks in OSPs;
- Defensible space clearing around 117 Midpen-owned structures;
- Maintaining hundreds of miles of fire roads; and
- Managing over 8,500 acres of grasslands through conservation grazing, which reduces fuel loads.

Description of Proposed Program

Purpose and Goals

Changing climatic conditions, past land uses, and years of fire suppression have increased fuel loads and fire-prone conditions that could contribute to larger and more intense wildland fires. Midpen seeks to protect the natural resources on its land and to make policy decisions that support local and state fire agencies to aid in the suppression of wildfire. The Program encompasses vegetation management, as well as planning, response, and monitoring. Vegetation management helps to restore ecosystems closer to pre-fire suppression conditions through the removal of dead and accumulated vegetation, and treatment of forest disease and invasive species. Prior to the mid- to late-20th century, landscapes in the San Francisco Bay Area were subject to periodic natural fire and Native American practices of prescribed burning that kept fuel loads down. Before European contact, the spread of invasive species that alter ecosystems and increase fire risks was a lower concern. Today, in the absence of decades of natural and prescribed fires, live and dead fuels have accumulated creating higher surface fuel loads, vegetation density, and varied species composition from what was seen prior to European contact. The Program would guide Midpen activities and be periodically updated, as needed, to adapt to changing conditions and improved knowledge. The primary objectives of the Program include the following:

1. Manage vegetation to establish healthy, resilient, fire-adapted ecosystems, furthering Midpen's mission to protect and restore the diversity and integrity of the ecological processes on Midpen lands and facilitating healthy post-fire recovery.
2. Integrate Native American cultural practices of vegetation management, particularly as they relate to prescribed fire, that promote ecological resiliency and enhance biodiversity.
3. Manage vegetation and infrastructure on Midpen lands to reduce wildland fire risks, improve wildland fire fighting capabilities and coordination, and improve overall safety to reduce the harmful effects of wildland fire on natural resources, people, and property.
4. Provide an adaptive framework for periodic review and adjustments of the Program based on a changing climate, improved knowledge, and improved technology over time. This framework will also recognize that annual implementation of the Program will need to be balanced with other competing Midpen priorities, capacity, and funding to determine the location, scale, timing, and scope of future vegetation management activities as part of annual workplans and approved fiscal year budgets.

Program Considerations

It is important to note that the Program EIR would be a programmatic document that is intended to help guide Midpen's vegetation and fuel management activities. As such, the Program provides a framework to guide decisions on the types, locations, and timing of vegetation and fuel management activities. The scope, scale, and level of focus that Midpen would be able to place on vegetation and fuel management activities would vary each year and would be dependent on other competing Midpen project and Program priorities, staffing capacity, and funding availability. Also, given the ongoing growth of Midpen land holdings, changing climate conditions that may affect fire risk levels across the landscape, and other factors, Midpen may shift their vegetation and fuel management priorities as needed in response to new or changed priority sites. Annual vegetation and fuel management projects and Program budgets would be reviewed in the context of

the larger agency-wide work plan with discretionary approval held by the Midpen Board of Directors as part of the annual budget and action plan development process.

Program Components

Program Overview

The Program would guide a comprehensive approach to vegetation management, including pre- and post-response activities to wildland fire on Midpen lands that integrates the following four plans:

1. Vegetation Management Plan (VMP)
2. Prescribed Fire Plan (PFP)
3. Wildland Fire Pre-Plan/Resource Advisor Maps
4. Monitoring Plan

The VMP and the PFP are the primary plans within the Program that could result in physical effects on the environment. In addition, the Wildland Fire Pre-Plan includes potential new infrastructure to support wildland fire response that also could result in physical effects on the environment. The Program EIR will focus on the elements of the Program that may result in physical effects on the environment.

Vegetation Management Plan

Overview

The VMP covers the creation of new vegetation treatment areas and maintenance of existing fuel treatment areas using various treatment methods (excluding the use of prescribed fire) to address ecosystem resiliency and/or to enhance fire management. Creation and maintenance of ecologically-sensitive vegetation management areas (VMAs) would reduce fuels by strategically and selectively thinning and removing vegetation to reduce the risk of extreme wildland fire behavior, slow the spread of a wildland fire, aid in the suppression and control of a wildland fire, and/or reduce the impacts of wildland fire should it occur. Treatment would also maintain healthy ecosystems, prioritizing treatment of invasive species over native species.

Although fuel reduction does not necessarily stop fires from spreading, reducing fuel loads lessens both fire intensity and severity, increasing resiliency to both the ecological and human communities. In addition, by slowing the spread of fire, additional time is afforded for fire personnel to respond and for private residents in the WUI to evacuate. The following VMAs would reduce wildland fire damage to natural resources, enhance fire suppression activities, and reduce fire spread:

- Fuel Reduction Areas (FRAs)
- Shaded and Non-Shaded Fuelbreaks
- Ingress/Egress Route Fuelbreaks
- Disclines
- Defensible Space
- Emergency Staging Areas, Emergency Landing Zones, and Other Fire Management Logistics Areas
- Eucalyptus and Acacia (Non-Native, Highly Combustible Plant) Removal

Types of VMAs

FRAs would be implemented for ecosystem resiliency. FRAs also enhance public safety when created in close proximity to the WUI and/or adjacent to existing fuelbreaks. FRAs are less permanent than fuelbreaks and are typically implemented in more natural areas (such as away from roads) where fuel load reduction achieves a combination of habitat enhancement goals and wildland fire risk reduction. Due to past land uses, fire management practices, and disease (such as Sudden Oak Death), reducing fuel loads in certain habitats can make the ecosystem more resilient to wildland fire. This reduction of fuels can reduce fire intensity, severity, and spread in case of a wildland fire. Vegetation management for ecosystem resiliency is performed at a considerably lower intensity than that for fire management.

Other types of VMAs include fuelbreaks. Fuelbreaks are linear strips of land where trees, vegetation, and dead material have been reduced or removed. A shaded fuelbreak is an area where the tree canopy would be thinned to reduce the potential for a fire to move quickly through and/or to reduce fire spread into or through the canopy. A non-shaded fuelbreak is a swath of land where fuels are reduced in areas without an existing tree canopy, typically at a change in vegetation type, such as from forest or shrubland into grassland, or within grasslands. Fuelbreaks can slow, and even stop the spread of a wildland fire because fewer fuels are present to combust. These areas also provide firefighters with zones to take a stand against or control the spread of a wildland fire, or retreat from fire if the need arises. For the purposes of the VMP, fuelbreaks encompass a range of fuel reduction intensities, depending on the resources being protected and the ecological setting. Fuelbreaks can vary in width from approximately 15 feet around minor ingress and egress routes and up to 200 feet around major routes of travel (e.g., highways) or associated with regional vegetation management treatments.

To enhance the safety of emergency staging areas and the safety of fire emergency personnel during an active wildland fire, the VMP would involve creation and maintenance of up to 200-foot shaded and non-shaded fuelbreaks around fire management areas (e.g., staging areas, landing zones), where feasible. Estimated maximum fuelbreak widths are shown in the following table.

TABLE 1 MAXIMUM FUELBREAK WIDTHS BY HABITAT TYPE

Habitat Type	Fuelbreak Width (feet)
Grass	100
Shrub	100
Oak woodland	200
Redwood or Douglas fir forest	200

An ingress/egress route fuelbreak is a 10- to 30-foot zone located on both sides of those roads identified as critical for emergency vehicle passage, typically designed to accommodate a Wildland Type 3 Fire Engine (a mid-sized fire engine built both for wildland mobility and large water capacity). Disclines are a type of mechanical vegetation treatment that would involve turning over the soil and leaving mostly a dirt surface that is intended to slow or stop progression of a fire. Defensible space is the area immediately surrounding a building(s) where vegetation management measures to reduce fuels are implemented, providing the key point of defense from an approaching wildland fire, or defense against escaping structure fires. Emergency

staging areas are key areas where fire suppression resources may safely park, gather crews, or land a helicopter during a wildland fire. These staging areas may also serve as a temporary refuge area during a wildland fire and must be of sufficient size to provide adequate safety for anticipated flame lengths, wind, and other factors. Emergency staging areas include existing parking areas and landing zones. Emergency landing zones allow helicopters to land in the event of an emergency. Eucalyptus and acacia trees would be removed from locations where these non-native and highly combustible trees pose a significant fire hazard.

Locations and Prioritization of VMAs

Several criteria would be used to determine the prioritization and location of new VMAs for both ecosystem resiliency and fire management. The criteria for ecosystem resiliency focus on natural resources, while the criteria for enhanced fire management focuses on infrastructure critical for emergency response, evacuation routes and protecting District managed structures. Prioritization will take into consideration projected staffing and financial resources to confirm long-term maintenance and management of fuel treatment areas. Each year, Midpen staff, with input from surrounding fire agencies, will identify the extent, scope, and location of the proposed VMAs to include in Annual Work Plans. The annual plan will be dependent upon numerous factors, including annual staffing capacity, funding availability, partnerships, and other resource availability, and be balanced with other Midpen priorities that also further Midpen's mission, annual *Strategic Goals & Objectives*, and the *Vision Plan*. District staff, with input from surrounding fire agencies, will annually prioritize areas for treatment and bring the anticipated budgets to the Board for review and approval as part of the annual capital improvement and action plan development process.

Cyclical Maintenance of VMAs

Frequency of maintenance can vary from annually, for vegetation management in grass-dominated vegetation types, to approximately once every 3 to 10 years depending on vegetation type, the fuel conditions, and regrowth. VMAs would be treated annually with Early Detection Rapid Response (EDRR) through Midpen's Integrated Pest Management Program (IPMP) to detect and remove invasive species that may arise. VMAs that border or traverse largely intact ecosystems still dominated by native species can be maintained with low-intensity brushing, performed as needed based on field inspections. In contrast, VMAs that are bordered or traversed by degraded ecosystems dominated by weeds need a different and more intensive maintenance prescription to reduce the spread of weeds in the VMA and into surrounding areas. VMAs with non-native species would be maintained with annual brushing, which removes invasive weeds; disposal of brush is accomplished via chipping, pile burning, or hauling. Invasive species treatment is addressed in Midpen's IPMP. The IPMP, however, does not address the acreages of mowing and the use of pesticides for VMA creation and maintenance; these are therefore included in the VMP.

Midpen annually mows over 100 miles of roadside to eliminate weeds, and unwanted vegetation and, where applicable, to allow access for Wildland Type 3 Fire Engines. These activities will continue on an annual basis, as defined in the IPMP and covered under that program and its certified EIR (2014; addendum 2019). The VMP would potentially expand on this existing treatment by creating and maintaining fuelbreaks along Wildland Type 3 ingress and egress routes and major routes, and widen the area of treatment, as appropriate.

Vegetation Management Methods for Creation and Maintenance of VMAs

As part of VMP implementation, Midpen would primarily rely on manual, mechanical, and grazing approaches to manage vegetation, consistent with existing vegetation management activities. These approaches currently account for approximately 90 percent of all vegetation management work, and similar percentages are expected to continue into the future even with the continual addition of newly protected open space acreage. Approximately 10 percent of all vegetation management work incorporates chemical methods under limited and controlled applications, supervised by State of California certified applicators. All vegetation management on Midpen lands prioritize invasive and non-native species removal over native species. Limited chemical control would involve use of the Midpen-approved pesticides listed in the IPMP and covered in the IPMP EIR and Addendum (Midpen, 2014; Midpen, 2019). For each type of vegetation management method, Midpen would continue to employ a series of best management practices (BMPs) to prevent, reduce, or mitigate potential impacts to ecological and/or human health and safety. All updates to the Board-approved pesticide list and associated BMPs would be incorporated into the Program.

Prescribed Fire Plan

The Program also includes a programmatic-level PFP. Prescribed burning is a specific activity in which fire is applied to most or all of a well-defined treatment area with discrete boundaries for the combined purpose of habitat improvement to restore and/or enhance ecosystem health and fuel load reduction. Prescribed fires would only be conducted with the agreement of the jurisdictional fire agency. Areas of Midpen land where prescribed fire would likely not be considered include those areas where burning is prohibited by law/regulation/ordinance, less than 0.25 miles of a smoke sensitive area (e.g., hospitals, schools, nursing homes), or where topography (e.g., slope, aspect) makes it unsuitable for a prescribed burn. The technique is particularly useful in grassland and oak woodland habitats, as it can both meet biological objectives by reintroducing natural ecological processes, including the regeneration of native fire-dependent vegetation, and reduce risk of wildland fire.

Prescribed fire burn plans would be utilized to identify site specific aspects of the burn. Burn units would be generally selected to take advantage of natural control lines, such as reservoirs and service roads, and changes in habitat types. Prescribed burning occurs in four distinct phases: pre-treatment, the burn event, mop-up and patrol, and rehabilitation. Pre-treatment may include removal and scattering of vegetation in addition to installation of control lines, where existing control lines do not exist. The burn event would typically be a full-day activity when fire would intentionally be applied at one or more ignition points and allowed to run between control lines across the designated unit. The fire is monitored until completely out. The prescribed burn sites would be patrolled by Midpen Early Detection Rapid Response (EDRR) crews for 1 to 5 years as needed following a burn event to protect the newly disturbed area from invasive species becoming established.

The PFP lays out the parameters, resources, and factors to guide the implementation of prescribed burns on Midpen lands, including: burn methods, fire durations, fire regimes, seasonality, exclusion zones, priority/recommended locations, vegetation types, monitoring of fuel loads, best management practices, pre- and post-fire activities, personnel, and equipment. The PFP also identifies the priority activities and mapping of burn units. Although prescribed burns would likely focus initially on grasslands, all habitat types that occur within Midpen OSPs would be evaluated and prioritized.

Wildland Fire Pre-Plan/Resource Advisor Maps

The Wildland Fire Pre-Fire Plan/Resource Advisor Maps are geographic-based documents to assist responding fire agencies during emergency response activities in the event of a wildland fire by providing information on fire suppression resources like water sources and staging areas. In addition, the maps provide information on sensitive natural and cultural resources to avoid, if possible, during fire suppression activities or to minimize harm to natural ecosystems. This component of the Program primarily describes planning actions and preparation of maps that do not have physical effects on the environment. The Wildland Fire Pre-Plans and Resource Advisor Maps include the following elements:

- Existing conditions and infrastructure that may aid fire suppression activities, including access roads, fuel breaks, structures, and water sources (hydrants, water tanks, ponds, creeks, and springs);
- Known sensitive natural and cultural resources for fire personnel to avoid, if possible, during fire suppression activities;
- Structures that are inhabited or are historically significant that should have resources committed to their defense during a wildland fire;
- Potential locations for fire suppression activities and equipment staging for Midpen lands in the event of a wildland fire;
- Suggested BMPS for wildland fire response and suppression activities;
- Areas where suppression activities should be limited (if feasible); and
- Circulation and access roads, including designated evacuation routes.

The Wildland Fire Pre-Fire Plan and Resource Advisor Maps have been and would continue to be prepared with input from the local community.

Monitoring Plan

The Monitoring Plan describes and references generally accepted protocols that monitor vegetation, water, and wildlife on Midpen lands to establish and compare pre- and post-project conditions, vegetation treatment response, and fuels inventories. Monitoring results are used to identify any adaptive management techniques that should be considered and incorporated in subsequent fuel management work. The monitoring protocols are based on best practices used by adjacent or regionally based land management agencies (e.g., National Park Service, State Parks) and supported by published research. More specifically, a monitoring plan may include the following:

- Monitoring pre-project vegetation, soil, erosion, and water quality to establish baseline conditions for post project analysis;
- Monitoring Burned Area Emergency Response/Burned Area Rehabilitation, and post fire response;
- Monitoring the response to other vegetation management activities;
- Assessing the achievement of project objectives;
- Assessing impacts to vegetation, soil, erosion, and water quality from fire or other vegetation management activities; and
- Inventorying and monitoring fuels to track fuel accumulation over time.

Monitoring Plans do not typically include elements that could result in physical effects on the environment, as they simply provide the protocols to monitor the environment.

Other Approvals Required

The Program requires approval from the Midpen Board of Directors. For the purposes of CEQA compliance and project implementation, Midpen serves as the lead agency in completing and certifying the CEQA document. Prescribed burns also require approval from the Bay Area Air Quality Management District (BAAQMD). Approval may be required by the United States Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (CDFW), the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB), and, if some activities occur within jurisdictional waters, the United States Army Corps of Engineers (USACE). Other permits and approvals may be identified during preparation of the Program EIR.

Potential Environmental Impacts

The Program EIR will describe the direct and indirect environmental impacts associated with implementation of the Program. The Program EIR will also evaluate the cumulative impacts of the Program when considered in conjunction with other related past, present, and probable future projects. All topics identified in the Appendix G Checklist of the CEQA Guidelines will be addressed in the Program EIR. Midpen expects that the Program could result in potentially significant environmental impacts in the following topic areas, which will be analyzed in the Program EIR:

Aesthetics	**Air Quality**	**Biological Resources**
Cultural Resources	**Geology and Soils**	**Greenhouse Gas Emissions**
Hazards and Hazardous Materials	**Hydrology and Water Quality**	**Noise**
Recreation	**Transportation**	**Tribal Cultural Resources**
Wildfire	**Mandatory Findings of Significance**	

Feasible mitigation measures will be identified to reduce any identified potentially significant impacts.

Alternatives to be Evaluated in the Program EIR

In accordance with the CEQA Guidelines Section 15126.6, the Program EIR will describe a reasonable range of alternatives to the proposed project that are capable of meeting most of the project's objectives but would avoid or substantially lessen any of the significant effects of the project. The Program EIR will identify any alternatives that were considered but rejected by the lead agency as infeasible and briefly explain the justification for this decision. The Program EIR will also provide an analysis of the No Project Alternative.

Documents Available for Public Review

A hard copy of the NOP is available for public review at:

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

The NOP is also available for public review online at: http://www.openspace.org/news/public_notices.asp

Opportunity for Public Comment

Interested individuals, groups, and agencies may provide Midpen with written comments on topics to be addressed in the Program EIR. Because of time limits mandated by state law, comments should be provided no later than 5:00 p.m. on May 28, 2020.

Agencies that will need to use the Program EIR when considering permits or other approvals for the proposed project should provide Midpen with the name of a staff contact person. Please send all comments to:

Midpeninsula Regional Open Space District
Attn: Coty Sifuentes-Winter, Senior Resource Management Specialist
330 Distel Circle
Los Altos, CA 94022
(650) 691-1200
Email: csifuentes@openspace.org

Comments provided by email should include "Wildland Fire Resiliency Program NOP Scoping Comment" in the subject line, and the name and physical address of the commenter in the body of the email.

All comments on environmental issues received during the public comment period will be considered and addressed in the Draft Program EIR, which is anticipated to be available for public review in summer 2020.

Public Scoping Meeting

A public scoping meeting will be held by Midpen to inform interested parties about the proposed project, and to provide agencies and the public with an opportunity to provide comments on the scope and content of the Program EIR. The meeting time and location are as follows:

May 13, 2020
5:00 p.m.
Board Room, Midpeninsula Regional Open Space District Administrative Office
330 Distel Circle, Los Altos, CA 94022
(650) 691-1200

In the event of the continuance of the Shelter-In-Place order due to COVID-19, the scoping meeting may be conducted via teleconference in accordance with the March 17, 2020 Governor issued Executive Order N-29-20. The meeting space is accessible to persons with disabilities. Individuals needing special assistive devices will be accommodated to Midpen's best ability. For more information, please contact the District Clerk at (650) 691-1200 or clerk@openspace.org at least 48 hours prior to the meeting.

APPENDIX 1.0-2 GLOSSARY OF TERMS

Term	Definition
All terrain vehicle (ATV)	Vehicles designed to be used off paved road, in all terrains. Examples include dirt bikes, 4-wheelers, side by sides, and quads.
Best management practices (BMPs)	Measures designed to broad implementation with the intent to protect many different resources, including water quality from soil erosion and runoff.
Burn Boss	Ensures that all Burn Plan specifications are met before, during, and after a prescribed fire.
Broadcast spraying	Applying an herbicide spray uniformly over an entire treated area. Broadcast spraying is not currently allowed within Midpen lands and is not proposed as part of the WFRP.
Burn Plan	Prescribed fire activities are implemented in accordance with a pre-written Burn Plan, which identifies land management goals and specific fire use strategies to safely achieve those goals, with prior approval by the applicable regulatory agencies. A Burn Plan addresses characteristics of the land being treated and specifies how the fire will be applied, by whom, and what fire control people and equipment must be on-scene before the burn can commence.
Control lines	Linear areas used to control a fire and maintained to provide wildland firefighters a location to perform wildfire suppression activities. Control lines include treatments such as disclines, and firelines. New control lines are typically 1-foot to 6-foot wide, depending on location, vegetation type, and type of equipment used to construct the line.
Cut stump	An herbicide treatment that combines physical removal of the above-ground portions of target invasive plants with chemical control of the roots. An herbicide solution is applied directly to the stump top immediately after cutting down the plant.
Critical infrastructure	Communications towers, evacuation centers, fire stations, Incident Command Posts (ICP), medivac sites, Shelter-in-Place (SIP) locations, water collection points, and water tanks. These are Federal Emergency Management Agency (FEMA) Target Hazards important for emergency response, and/or disaster recovery functions.
CWPP Priority Areas	Locations defined in Community Wildfire Protection Plans as priority areas for hazardous fuel reduction treatments.
Defensible space	The buffer created between a building and the grass, trees, shrubs, or any wildland area that surround it. This space is needed to slow or stop the spread of wildfire and it protects buildings from catching fire—either from direct flame contact or radiant heat. Defensible space is also important for the protection of the firefighters defending buildings. There are three defensible space zones with different treatment requirements; within 5 feet, within 30 feet, and within 30 to 100 feet from buildings.
Discline	A treatment of 10 feet or more created using an agricultural disc or bulldozer to create an area of bare mineral soil without flammable vegetation. See "control lines".
Ecosystem resilience	Ecological resilience is the ability of an ecosystem to maintain its normal patterns of nutrient cycling and biomass production after being subjected to damage caused by an ecological disturbance.
Emergency Staging Areas	Areas defendable from wildfire which are large enough to stage firefighting equipment, supplies, and personnel prior to deployment to a wildfire. Staging areas must be located where equipment, supplies, and personnel can reach the fireline within 1 hour.

Term	Definition
Emergency Landing Zones or Landing Zones	Areas where wildfire helicopters can land and take off safely with equipment, supplies, personnel, and water. Some landing zones are suitable for refueling and firefighting water filling.
Eucalyptus removal	Removal of trees in the genus "Eucalyptus". The most common species is Blue Gum Eucalyptus, *Eucalyptus globulus*. Control is accomplished by mechanical removal of standing trees followed by herbicide treatment.
Evacuation Routes (Primary and Secondary)	Evacuation routes were designated by the following plans: Woodside Evacuation Plan, King Hill Plan, Skyline Ridge Evacuation Plan, Redwood West Lexington Pre-Plan, Las Cumbres Evacuation Plan, Santa Clara County Plan, and East Lexington Basin Fire Pre-Plan. Some Primary and Secondary Evacuation Routes specific to Midpen Lands are designated in this plan which were not defined in another local plan.
Firelines	A break in fuel, made by cutting, scraping, or digging. See "control lines".
Fire Effects Monitor	Responsible for collecting incident status information and providing this information to the Burn Boss. The information may include fire perimeter location, on-site weather, fire behavior, fuel conditions, smoke, and fire effects information needed to assess firefighter safety and whether the fire is achieving established incident objectives and requirements.
Fire Management Logistics Areas	Locations where firefighting planning and efforts occur, including helispots, fire lookouts, safety zones, and staging areas.
Firing Boss	Leads ground ignition operations and is responsible for the safety and coordination of assigned resources on prescribed fire and wildfire incidents.
Fuelbreak	An area where fire fuels are modified to change the behavior of a fire in order to reduce the flame lengths and energy output. A fuelbreak acts as an achor point for indirect attack on wildfires, operational tool for firefighters to create backfires, and supports safer ingress/egress for emergency responders and the public. Fuelbreaks may be around Wildland Type 3 ingress/egress routes, evacuation routes, and other trails and roads.
Fuel Reduction Area (FRA)	An area where specific fuel management prescriptions are applied. FRAs are less permanent than fuelbreaks and are typically implemented in more natural areas where fuel load reduction achieves a combination of habitat enhancement goals and wildland fire risk reduction.
Helispot	See "Emergency Landing Zones".
Incident Command Post (ICP)	The location where primary command functions are executed by the Incedent Commander and his/her team.
Ingress/egress route (i.e., Wildland Type 3 ingress/egress)	Unimproved roads and trails capable of allowing transit by a Wildland Type 3 fire engine. These roads and trails are typically 8 to 12 feet wide.
Ladders fuels	Also referred to as “fuel ladders.” Shrubs, small trees, and grass that can allow a surface wildland fire to travel up into the tree canopy and turn into a crown fire.

Term	Definition
Mop Up	To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.
Non-shaded fuelbreak	A non-shaded fuelbreak is used in a swath of land where fuels are reduced in areas without a tree canopy, typically at a change in vegetation type, such as from forest or shrubland into grassland, or within grasslands. Non-shaded fuelbreaks are most often maintained in grasslands or shrublands versus wooded areas, although they can be implemented at a transition, particularly near homes if deemed critical for fire safety or necessary to meet defensible space requirements. See "fuelbreak".
Pile burn	A fuel treatment where brush and trees are cut or pushed with a machine, and then piled and burned.
Prescribed fire/burn	Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and all regulatory requirements must be met prior to ignition.
Prescribed Fire Plan (PFP)	A document that provides the prescribed fire burn information needed to implement an individual prescribed fire project.
Prescribed herbivory	A method used as pre-treatment to reduce fuel loads prior to implementation of other fuel treatment methods where livestock are allowed to consume vegetation.
Primary evacuation route	If not defined in a local plan, Primary Evacuation Routes are defined as major roadways which will channel most if not all traffic out of a large area.
Refugia	An area within an FRA where certain activities are prohibited, such as use of artificial light. A Midpen-approved biologist may designate sites within an FRA as “refugia” areas prior to the creation of the FRA.
Resource Advisor	Provides professional knowledge and expertise for the protection of natural, cultural, and other resources within an incident environment.
Safety zone	An area cleared of flammable materials used for escape in the event a fireline is outflanked or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuelbreaks; they are greatly enlarged areas which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity. See "control lines".
Secondary evacuation route	If not defined in a local plan, Secondary Evacuation Routes are defined as either local or neighborhood feeder roads or routes alternate to Primary Evacuation Routes. Generally, individual driveways are excluded; however, there are exceptions.
Shaded fuelbreak	A type of fuelbreak used in forested areas. Enough tall tree canopy is retained to maintain shade, reduce the potential for rapid re-growth of shrubs and sprouting hardwoods, and minimize erosion. Ladder fuels and woody understory vegetation are thinned out. The purpose of a shaded fuelbreak is to reduce ladder fuels and increase base canopy height of trees for the purpose of preventing fires from spreading from the forest floor into the forest canopy. See "fuelbreak".

Term	Definition
Smoke management plan	A plan submitted to the BAAQMD that specifies the “smoke prescription,” which is a set of air quality, meteorological, and fuel conditions needed before burn ignition may be allowed.
Spot spray	Applying an herbicide spray to individual weeds directly, or in "spots," rather than applying a product to the entire area (see “broadcast spray”).
Staging area	A location set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.
Structure Type 1 (tender) Route	Roads and trails capable of allowing transit by a Type 1 (or Class A) fire engine. A Type 1 fire engine is most common in a metropolitan communities. Large cities rely on Type 1 fire apparatus based on flexibility, staffing, and the ability to operate at homes, apartments, businesses, and high rise buildings. Technically, a Type 1 fire engine is designed for structural firefighting. It will typically include a pump that operates at 1,000 gallons per minute (GPM) and includes a 400 gallon tank, 1,200 feet of 2 1/2-inch hose, 400 feet of 1 1/2-inch hose, 200 feet of 1-inch hose, 20+ feet of ladder, a 500 GPM Master Stream, and minimum staffing of typically four firefighters.
Target hazards	Facilities in either the public or private sector that provide essential products and services to the general public, are otherwise necessary to preserve the welfare and quality of life in the community, or fulfill important public safety functions. Target hazards include assisted living facilities, campsites, hospitals, community centers, schools, and mobile home parks.
Traditional ecological knowledge	The evolving knowledge acquired by indigenous and local peoples over hundreds or thousands of years through direct contact with the environment. This knowledge is specific to a location and includes the relationships between plants, animals, natural phenomena, landscapes and timing of events that are used for lifeways, including but not limited to hunting, fishing, trapping, agriculture, and forestry.
Vegetation management (fuel management)	The practice of removing or modifying live and dead vegetation to reduce the potential spread of wildland fire ignitions, overall rates of wildland fire spread, flame lengths, and catastrophic fire severity. Vegetation management activities typically occur within vegetation management areas (see below).
Vegetation management area (VMA)	A broad area where vegetation management is implemented. Types of VMAs include defensible space, disclines, FRAs, and fuelbreaks.
Vegetation Management Plan (VMP)	A document intended to mitigate the risk of wildfire by reducing flammable vegetation in wildlands and around structures in the WUI. For the Wildland Fire Resiliency Program, the VMP defines the suite of vegetation management activities that Midpen may implement to reduce the potential for ecologically-catastrophic wildland fires while also preserving biodiversity and minimizing effects on the environment. This VMP focuses on what is referred to as “non-fire” vegetation management. Only manual, mechanical, conservation grazing, and limited chemical methods of vegetation management are considered
Wildland Fire Pre-Plan/Resource Advisor Maps	Map-based documents that can aid CAL FIRE and other firefighting agencies in their firefighting efforts in the event of a wildland fire.

Term	Definition
Wildland Type 3 Fire Engine	A Type 3 fire engine is the most popular fire engine in California due to the easy road access of most fires. A Type 3 fire engine traditionally has four-wheel drive to make driving over rough terrain easier, but can also be produced with standard rear wheel drive. The cab can either be two- or four-door holding up to five people. Type 3 fire engines are required to have a minimum of 500 gallons of water and be able to pump 150 gallons per minute at a pressure of 250 pounds per square inch (1,700 kPa). They have a typical gross vehicle weight rating (GVWR) of 26,000 pounds.
Wildland-urban interface (WUI)	The area where houses and other structures are built close to, or intermingled with, undeveloped wildlands. The WUI poses significant concern in the event of fire, as it combines the characteristics of wildlands (where larger fires generally occur) and developed areas (where lives, homes, and property are vulnerable).

APPENDIX 3.0-1 VEGETATION MANAGEMENT MAPS

Appendix 3.0-1a Existing and Potential Treatments (Overlaid on Topographic Maps)

Appendix 3.0-1b Tier 1 and Tier 2 Prioritized Treatments (Overlaid on Topographic Maps)

Appendix 3.0-1a Existing and Potential Treatments (Overlaid on Topographic Maps)

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These maps are for reference only. Although every effort has been made to ensure the accuracy of information, errors and conditions originating from physical sources used to develop the data may be reflected on this map. Midpeninsula Regional Open Space District shall not be liable for any errors, omissions, or damages that result from inappropriate use of this document.

Existing and Potential Treatments
Miramontes Ridge

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Non-Shaded Fuelbreak

Potential Fuels Treatments

- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

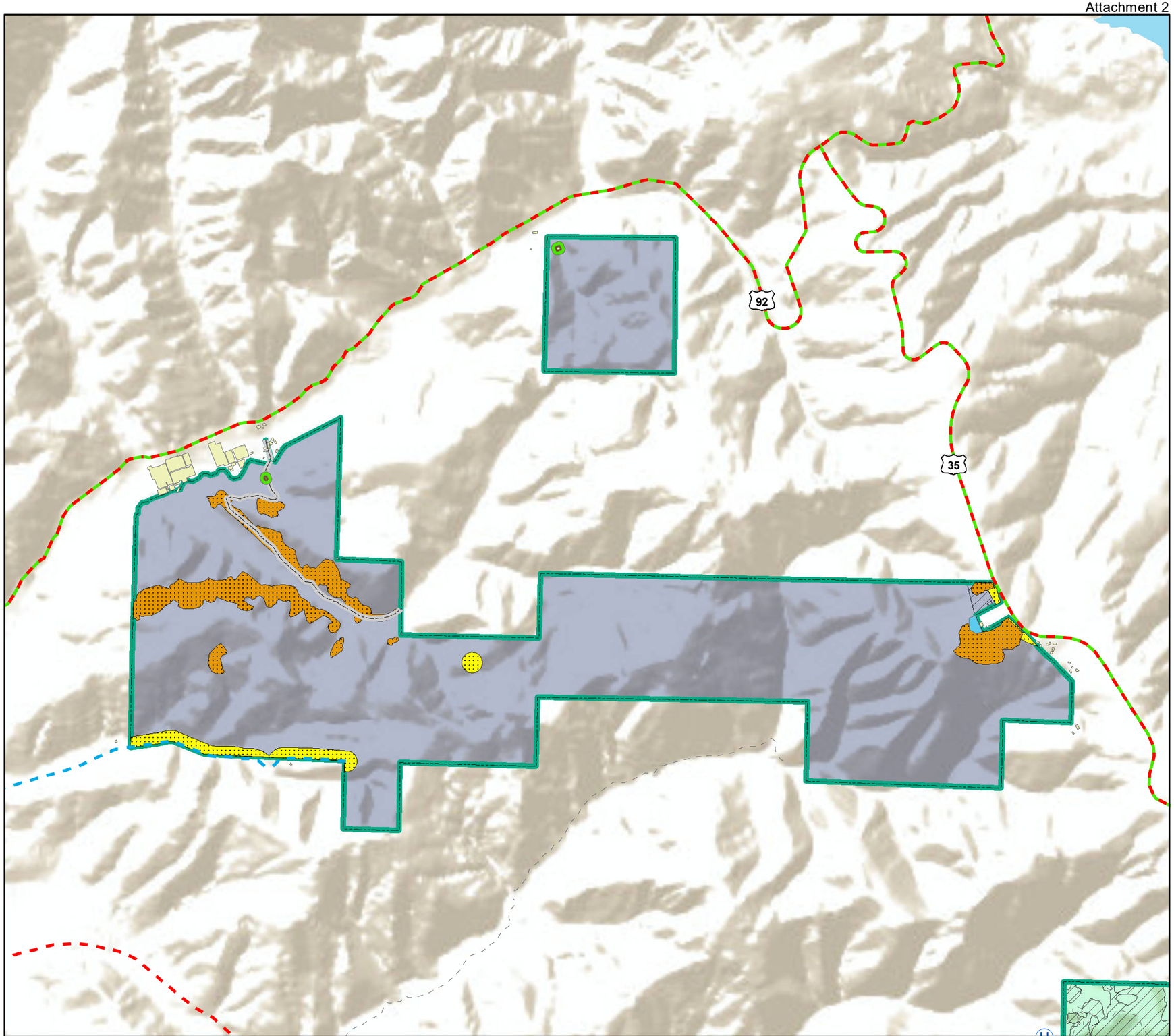
- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail

Fire Management Logistics

- (H) Helispot

OSP & Managed Properties

- Boundary
- Miramontes Ridge
- Purisima Creek Redwoods



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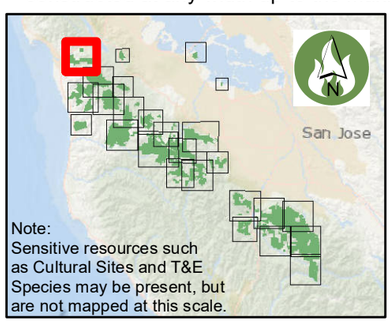

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Existing and Potential Treatments
Pulgas Ridge

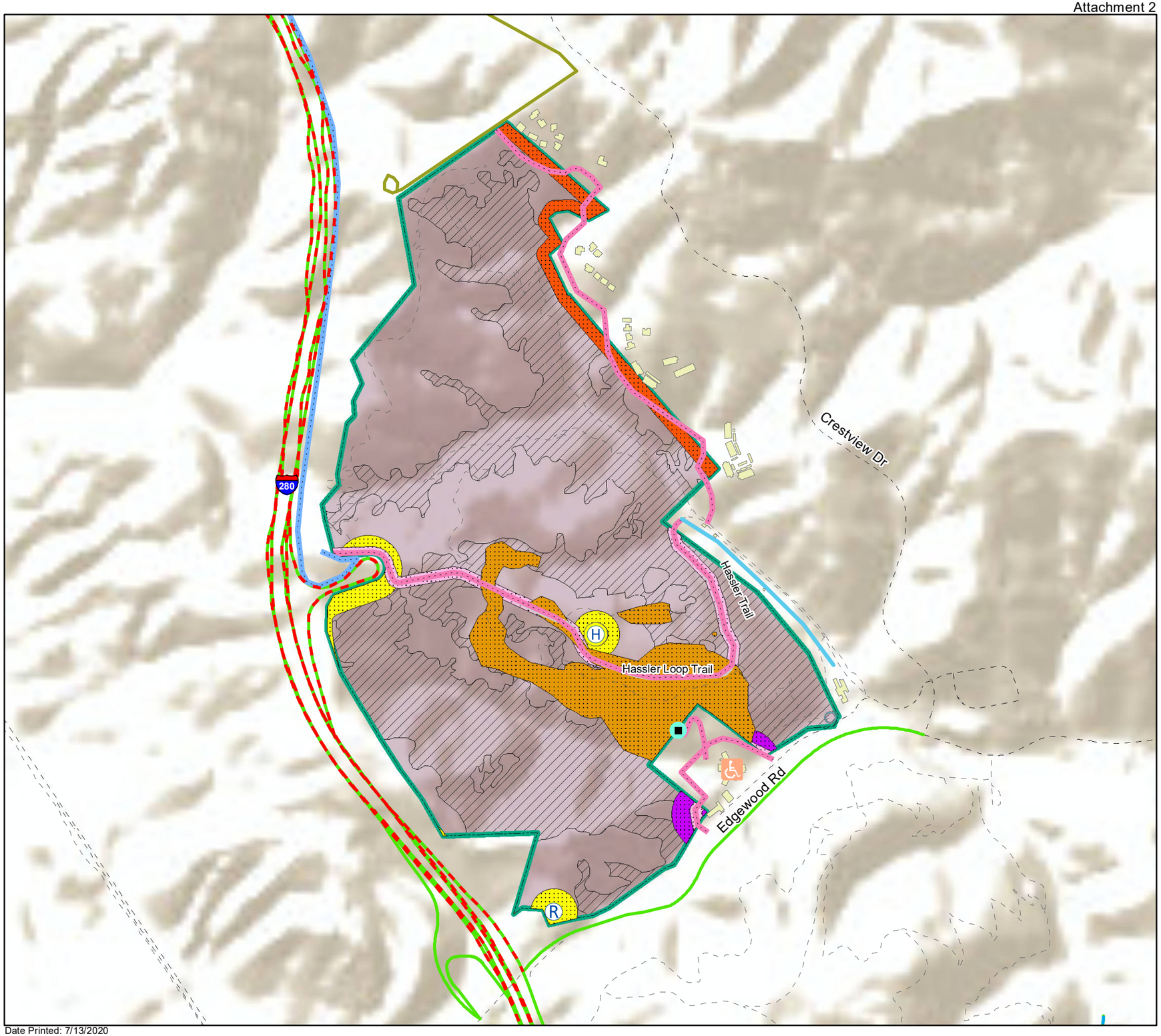
Existing Treatments
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Discline

Potential Fuels Treatments
- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Water Tank

Target Hazards
- Assisted Living Facility

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Pulgas Ridge



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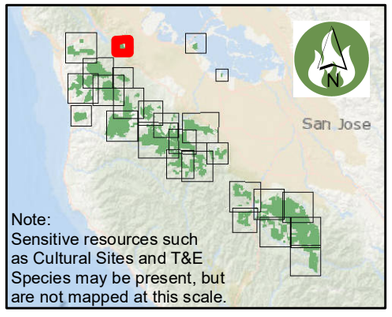

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Existing and Potential Treatments
Purisima Creek Redwoods

Existing Treatments
- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak

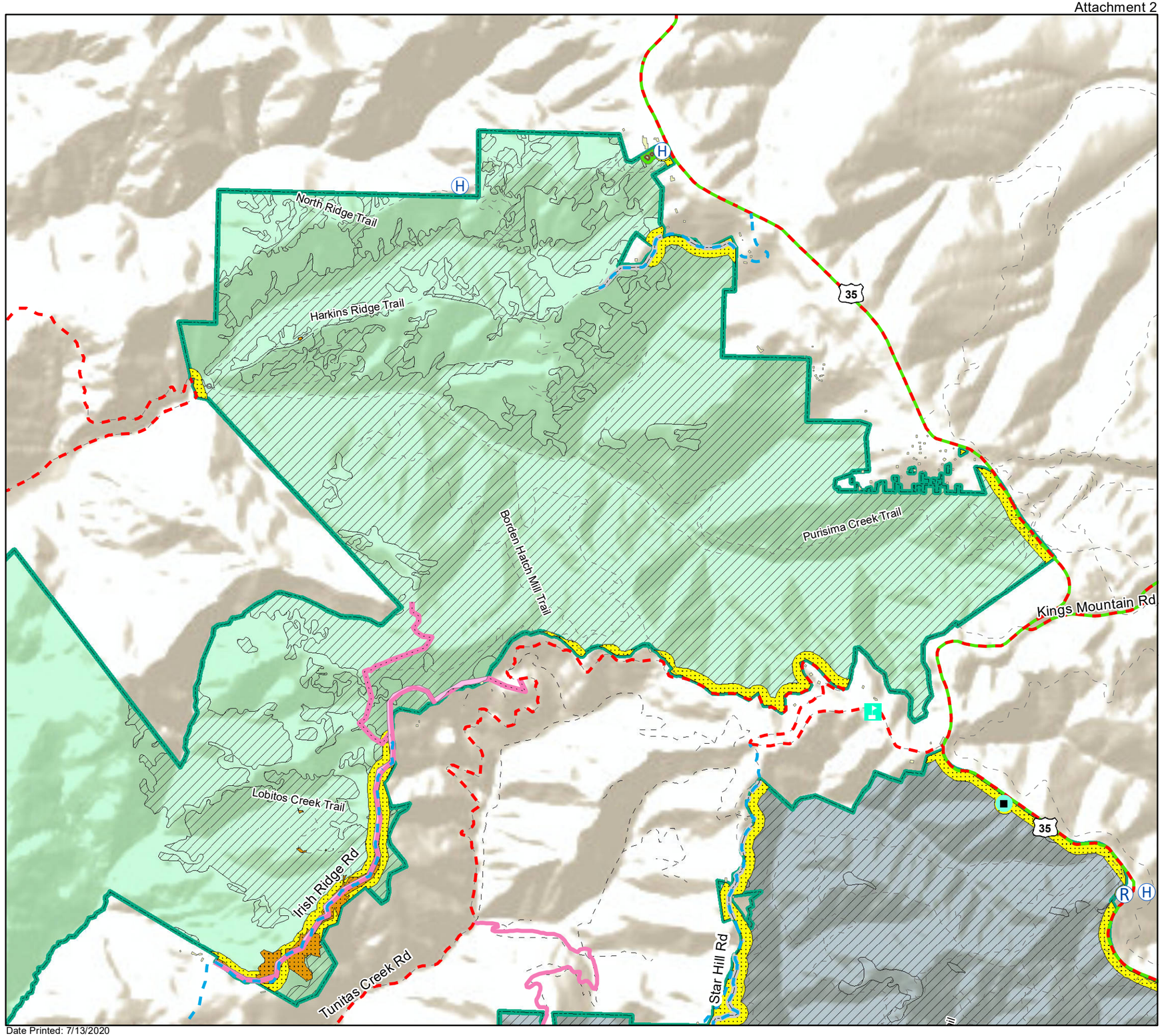
Potential Fuels Treatments
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail
- Communication
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- El Corte de Madera Creek
- Purisima Creek Redwoods



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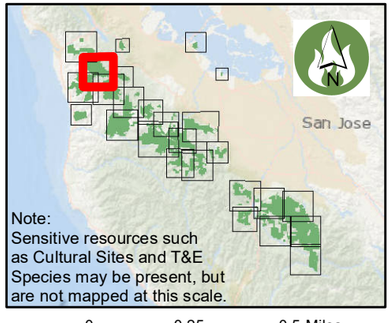

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Existing and Potential Treatments
Purisima Creek/Tunitas Creek

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Shaded Fuelbreak

Potential Fuels Treatments

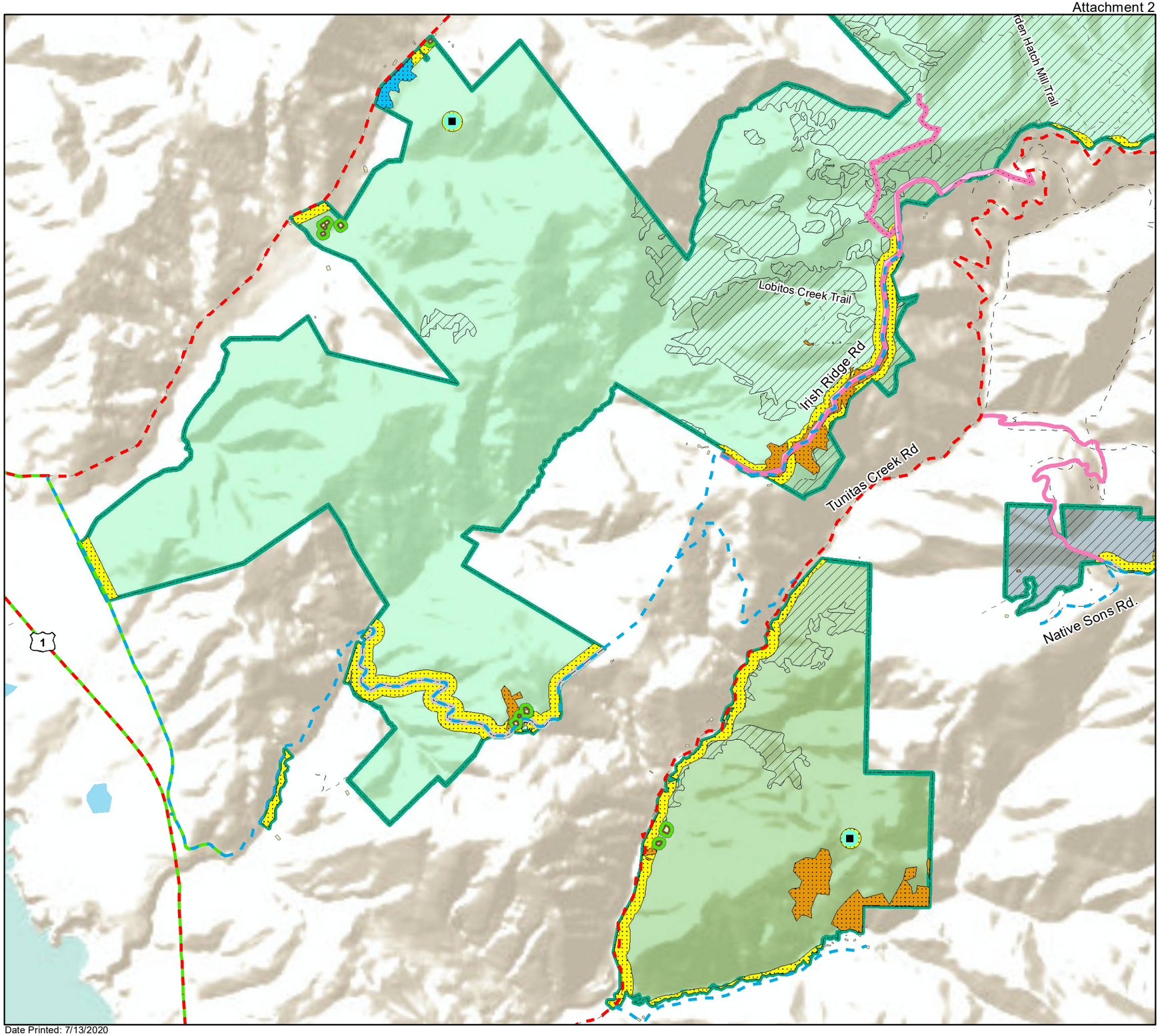
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail
- Water Tank

OSP & Managed Properties

- Boundary
- El Corte de Madera Creek
- Purisima Creek Redwoods
- Tunitas Creek



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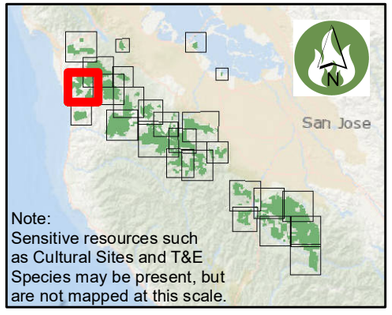

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Existing and Potential Treatments
Tunitas Creek

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Non-Shaded Fuelbreak

Potential Fuels Treatments

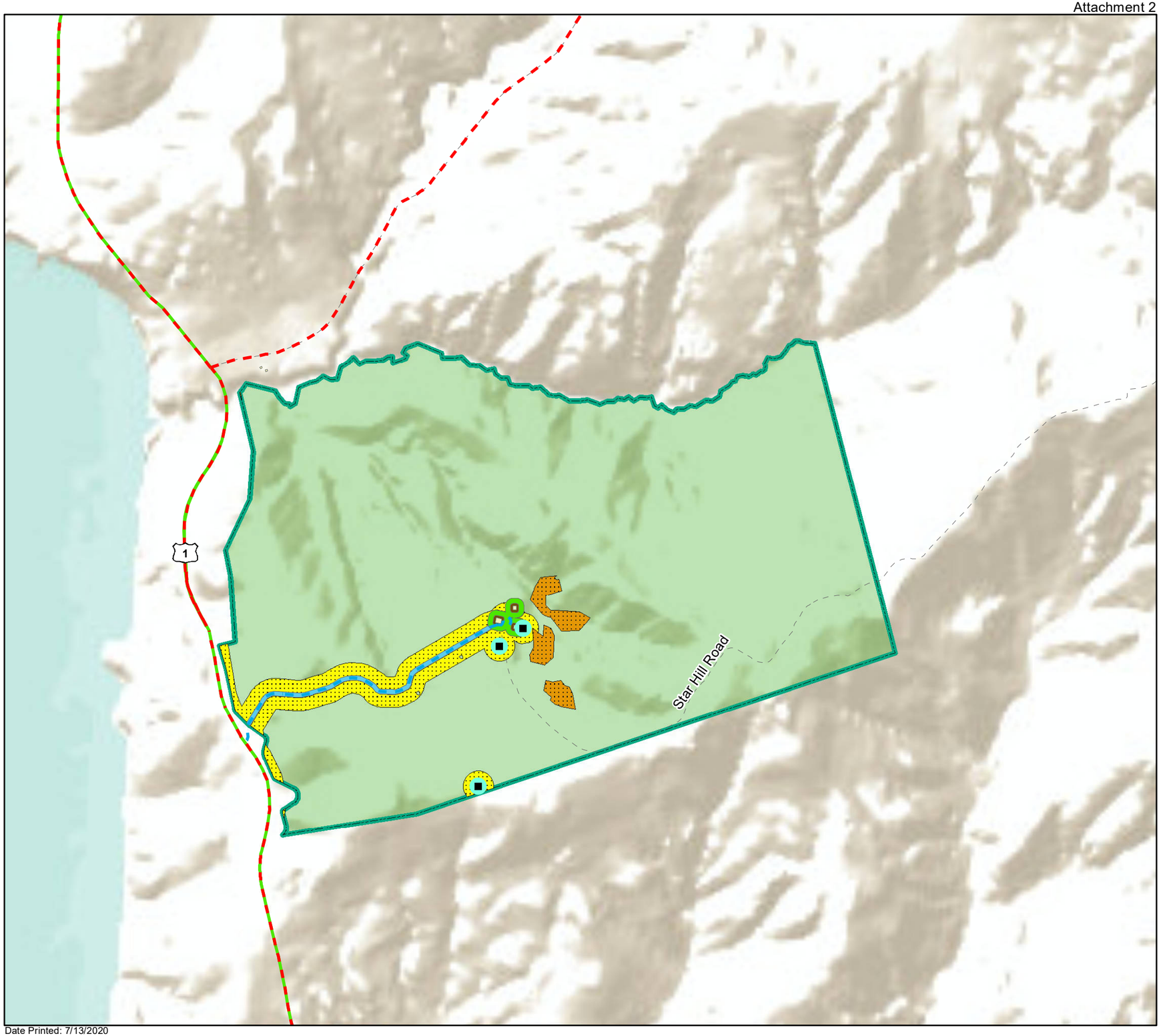
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail
- Water Tank

OSP & Managed Properties

- Boundary
- Tunitas Creek



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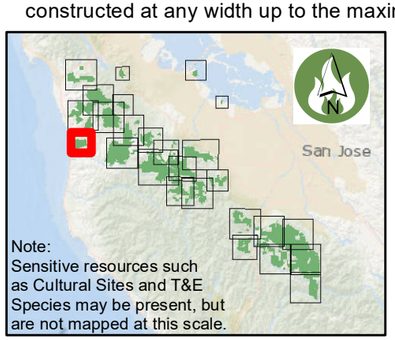


0 0.25 0.5 Miles

Existing and Potential Treatments
Teague Hill

Existing Treatments

- Shaded Fuelbreak

Potential Fuels Treatments

- Fuelbreak 200-foot
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency

Critical Infrastructure

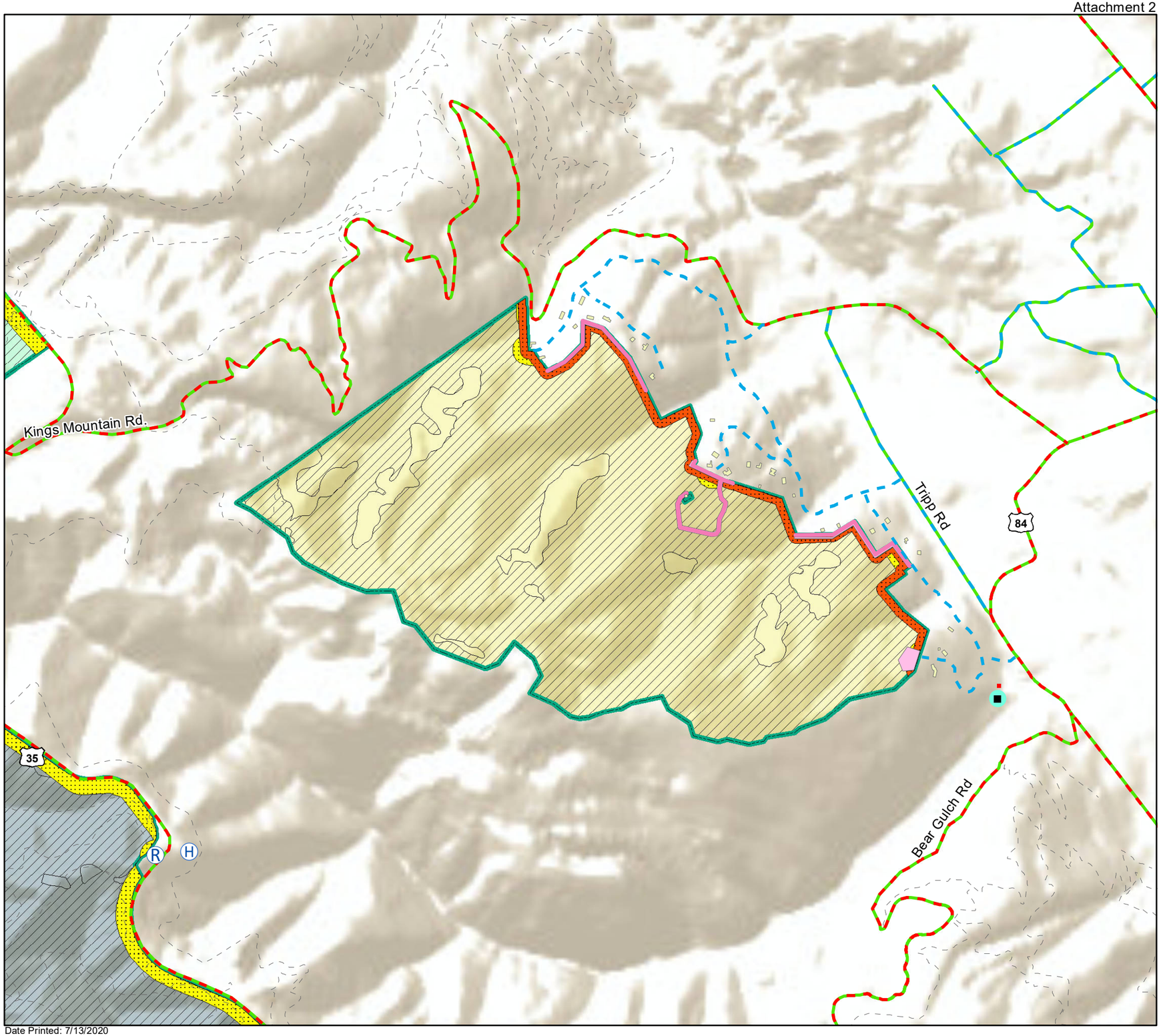
- Secondary Evacuation Route
- Road or Trail
- Communication
- Water Tank

Fire Management Logistics

- Helispot

OSP & Managed Properties

- Boundary
- El Corte de Madera Creek
- Purisima Creek Redwoods
- Teague Hill



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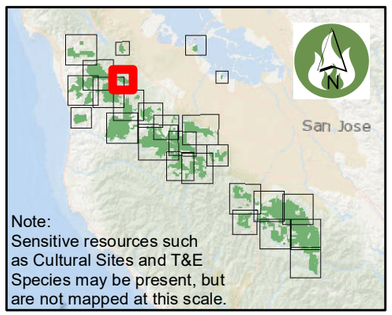

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Existing and Potential Treatments
El Corte de Madera Creek

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak

Potential Fuels Treatments

- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Communication
- Water Tank

Target Hazards

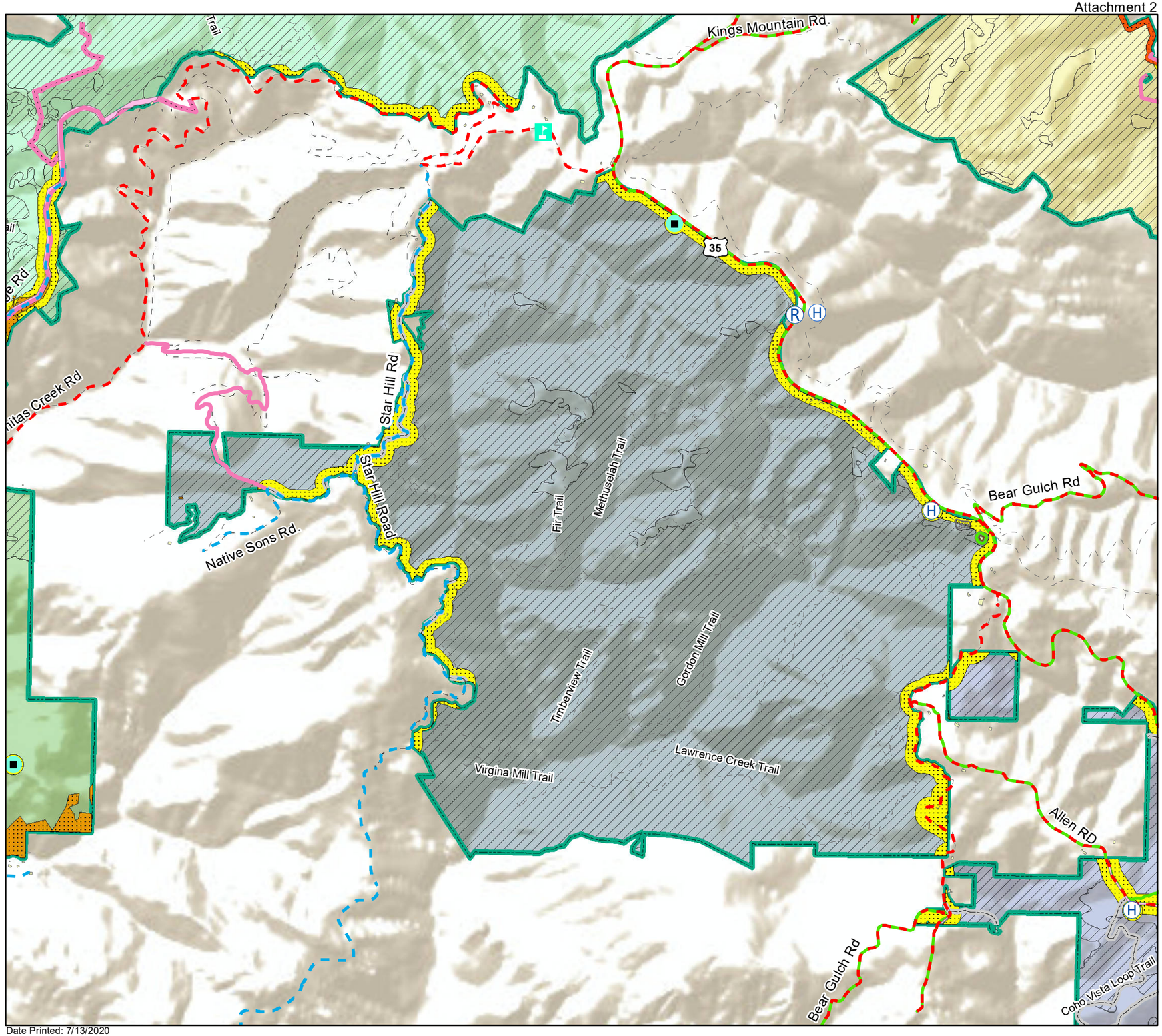
- School/Day Care

Fire Management Logistics

- Helispot

OSP & Managed Properties

- Boundary
- El Corte de Madera Creek
- La Honda Creek
- Purisima Creek Redwoods
- Teague Hill
- Tunitas Creek



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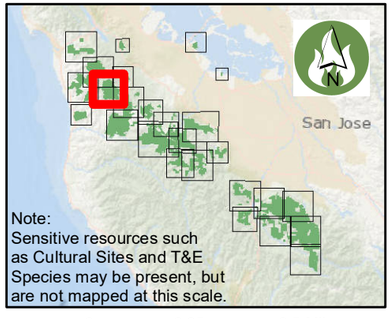


0 0.25 0.5 Miles

Existing and Potential Treatments
La Honda Creek/Thornewood

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Water Tank

Target Hazards

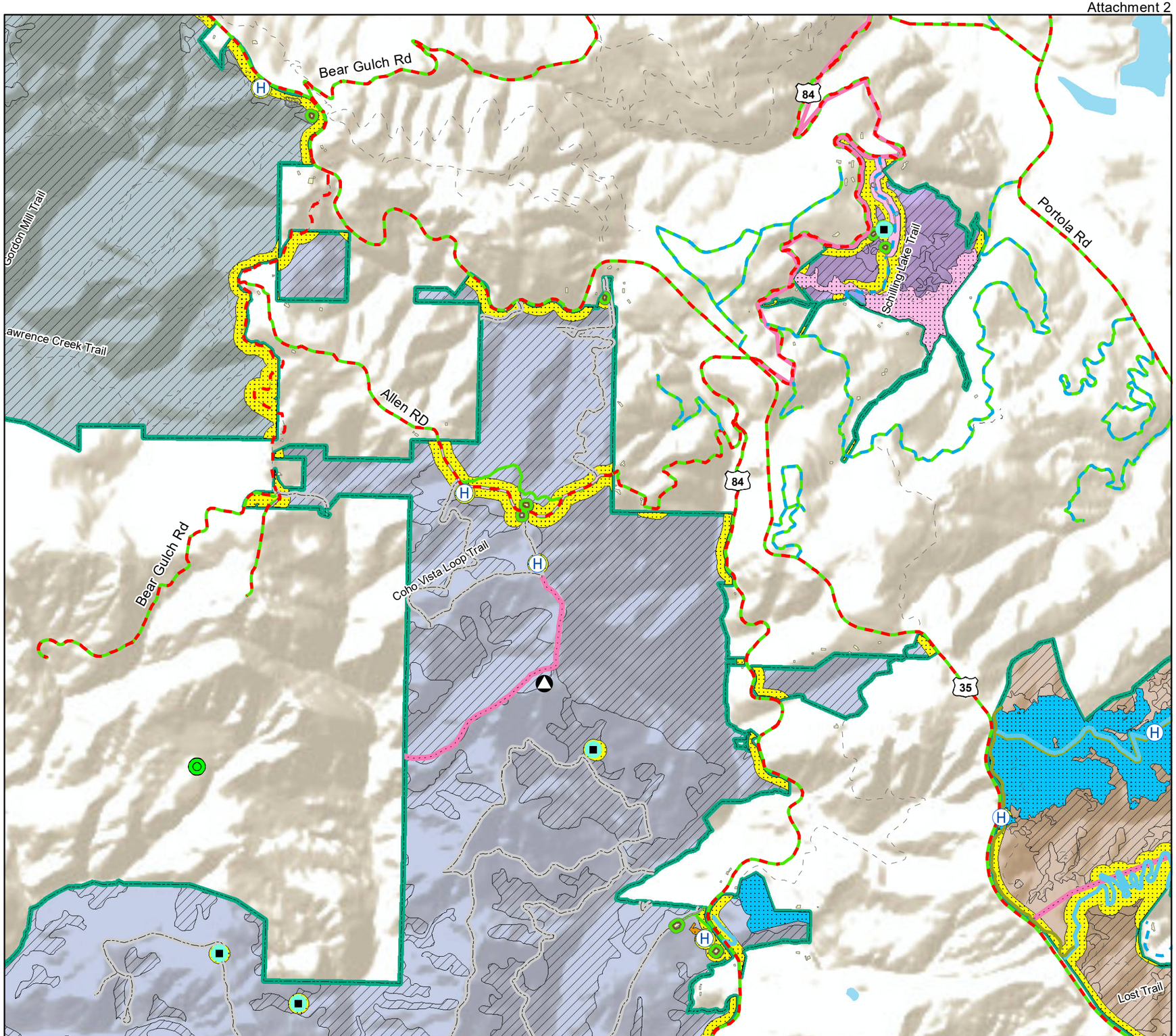
- Community Center

Fire Management Logistics

- Helispot
- Lookout

OSP & Managed Properties

- Boundary
- El Corte de Madera Creek
- La Honda Creek
- Thornewood
- Windy Hill



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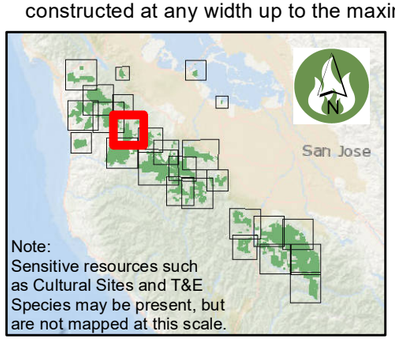


0 0.25 0.5 Miles

Existing and Potential Treatments
La Honda Creek

Existing Treatments
- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak

Potential Fuels Treatments
- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency
- Discline
- Wildland Type 3 Ingress/Egress

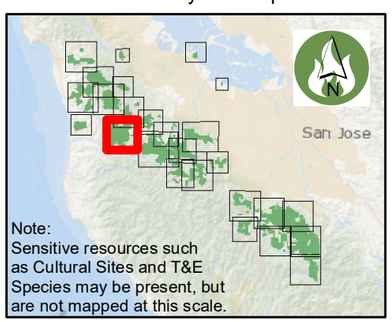
Critical Infrastructure
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Water Tank

Target Hazards
- School/Day Care
- Mobile Home Park

Fire Management Logistics
- Helispot
- Lookout
- Staging

OSP & Managed Properties
- Boundary
- La Honda Creek
- Russian Ridge

* See Table of Contents page for additional symbology.
** Fuel break widths are maximums. Fuelbreaks may be constructed at any width up to the maximum width.



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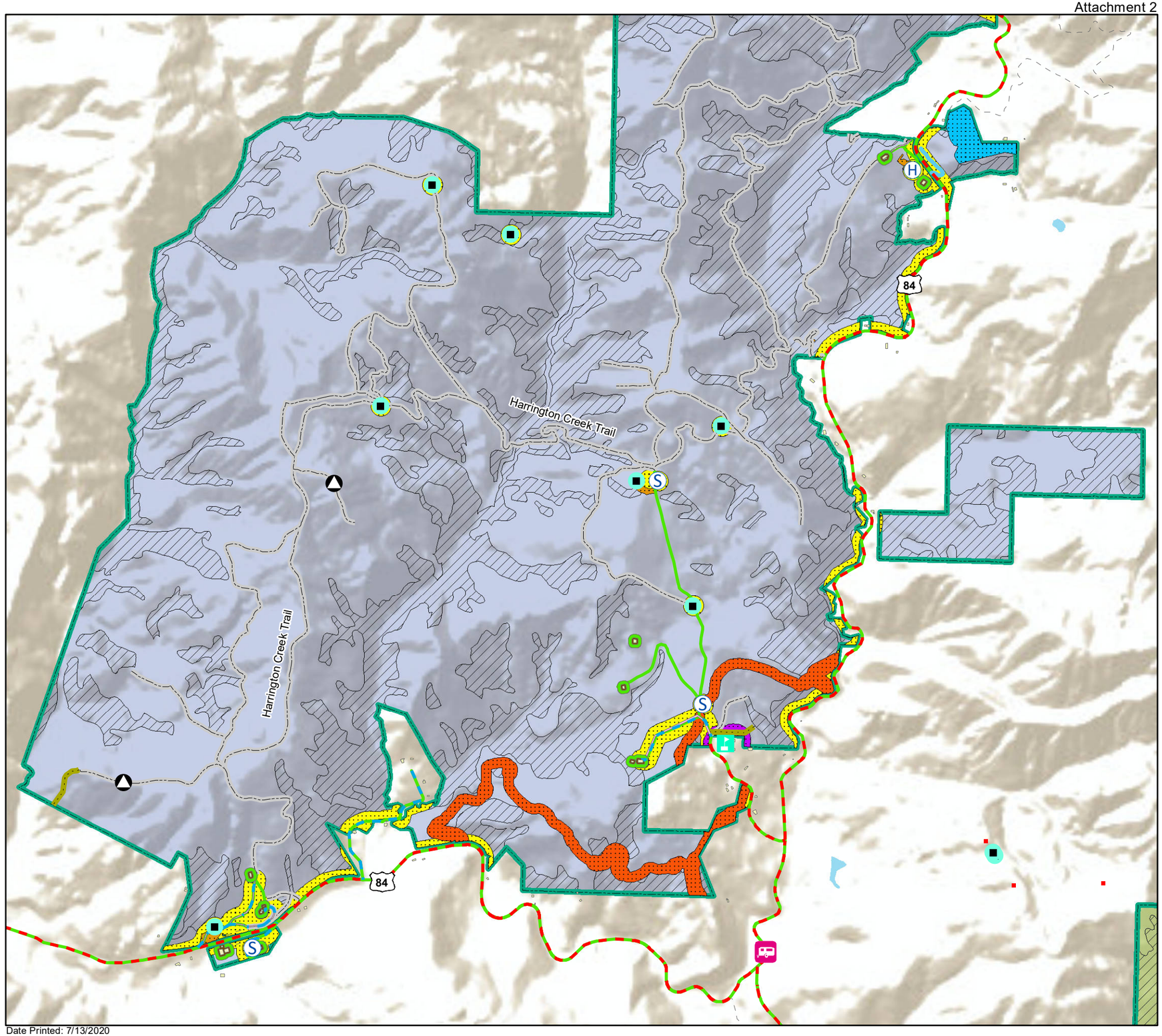

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Existing and Potential Treatments
Windy Hill

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- SIP — Shelter-in-Place
- Water Tank

Target Hazards

- Assisted Living Facility
- School/Day Care

Fire Management Logistics

- Helispot

OSP & Managed Properties

- Boundary
- Coal Creek
- La Honda Creek
- Russian Ridge
- Windy Hill

* See Table of Contents page for additional symbology.
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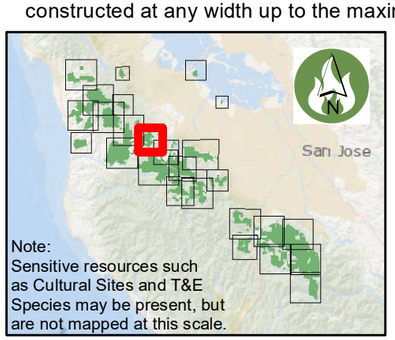

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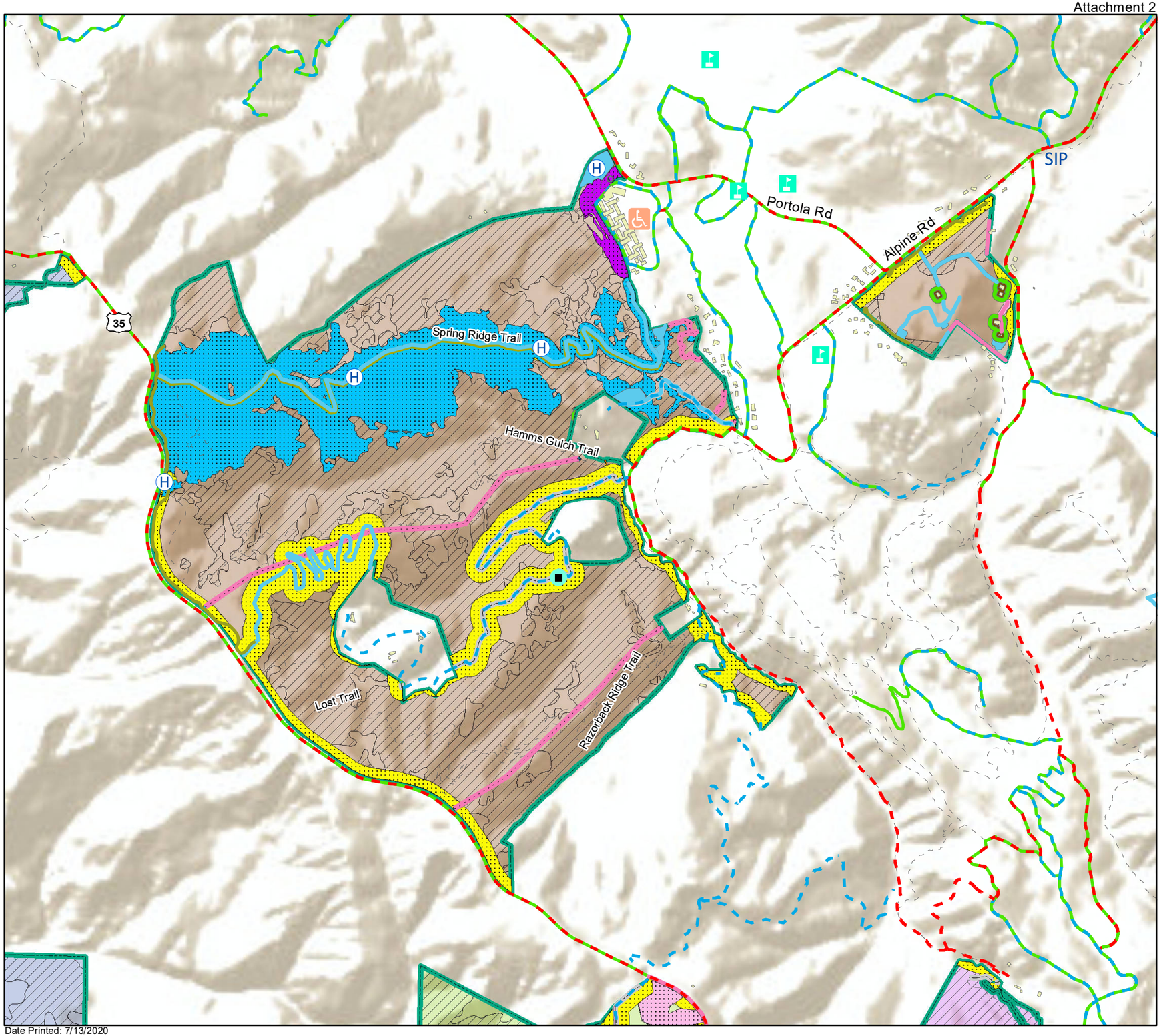

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Existing and Potential Treatments
Russian Ridge/Coal Creek/Skyline Ridge

Existing Treatments
- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

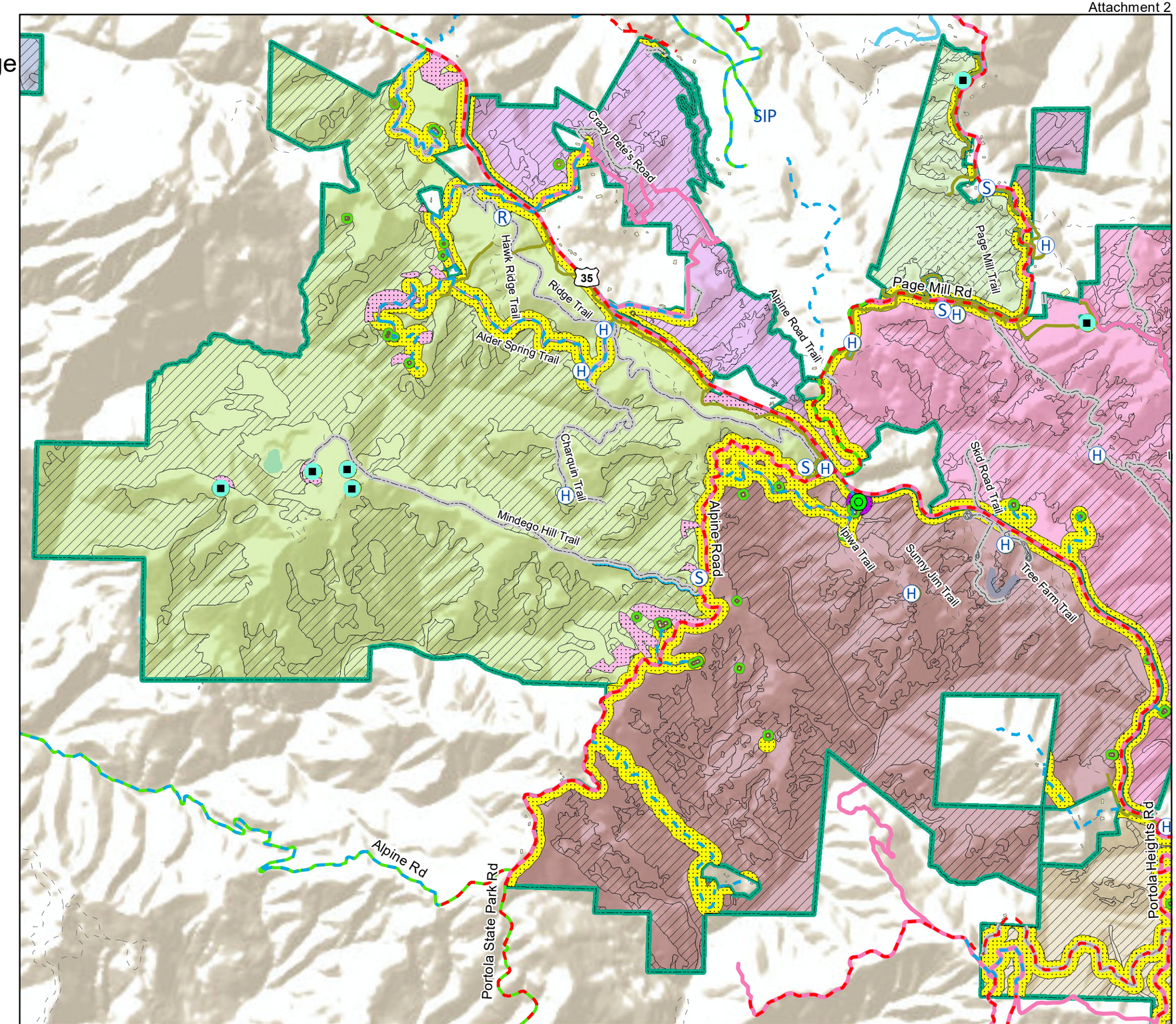
Potential Fuels Treatments
- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- (R) Communication
- SIP Shelter-in-Place
- Water Tank

Target Hazards
- Community Center

Fire Management Logistics
- (H) Helispot
- (S) Staging Area

OSP & Managed Properties
- Boundary
- Coal Creek
- Foothills
- La Honda Creek
- Long Ridge
- Los Trancos
- Monte Bello
- Russian Ridge
- Skyline Ridge



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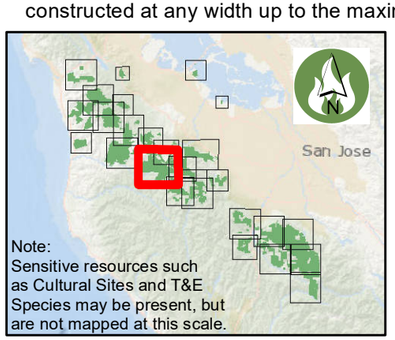


0 0.25 0.5 Miles

Existing and Potential Treatments
Coal Creek/Foothills/Los Trancos

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

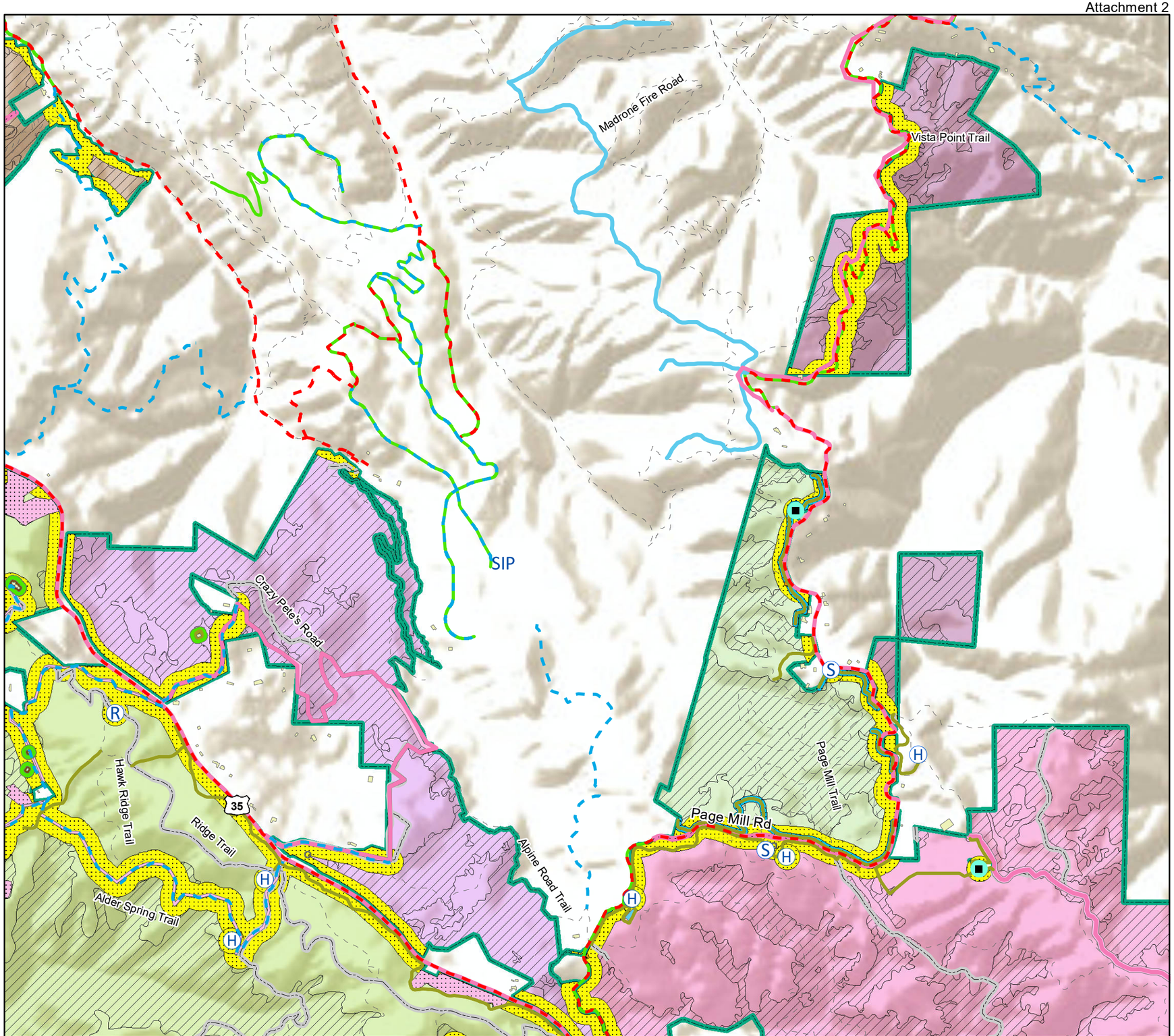
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- (R) Communication
- SIP Shelter-in-Place
- Water Tank

Fire Management Logistics

- (H) Helispot
- (S) Staging Area

OSP & Managed Properties

- Boundary
- Coal Creek
- Foothills
- Los Trancos
- Monte Bello
- Russian Ridge
- Windy Hill



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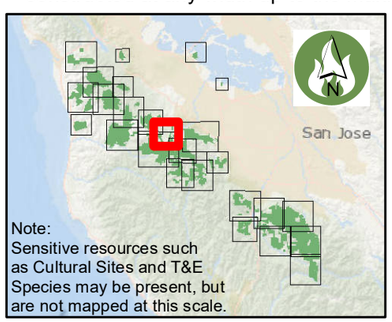

0 0.25 0.5 Miles

Existing and Potential Treatments
Rancho San Antonio

Existing Treatments
- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments
- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Eucalyptus and Acacia Removal
- Non-Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Discline
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- (R) Communication

Target Hazards
- Assisted Living Facility
- Community Center
- School/Day Care

Fire Management Logistics
- (H) Helispot
- Lookout
- (S) Staging Area

OSP & Managed Properties
- Boundary
- Monte Bello
- Rancho San Antonio
- Rancho San Antonio County Park

* See Table of Contents page for additional symbology.
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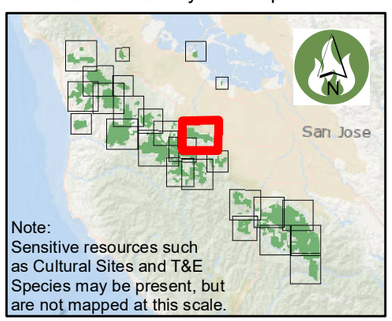

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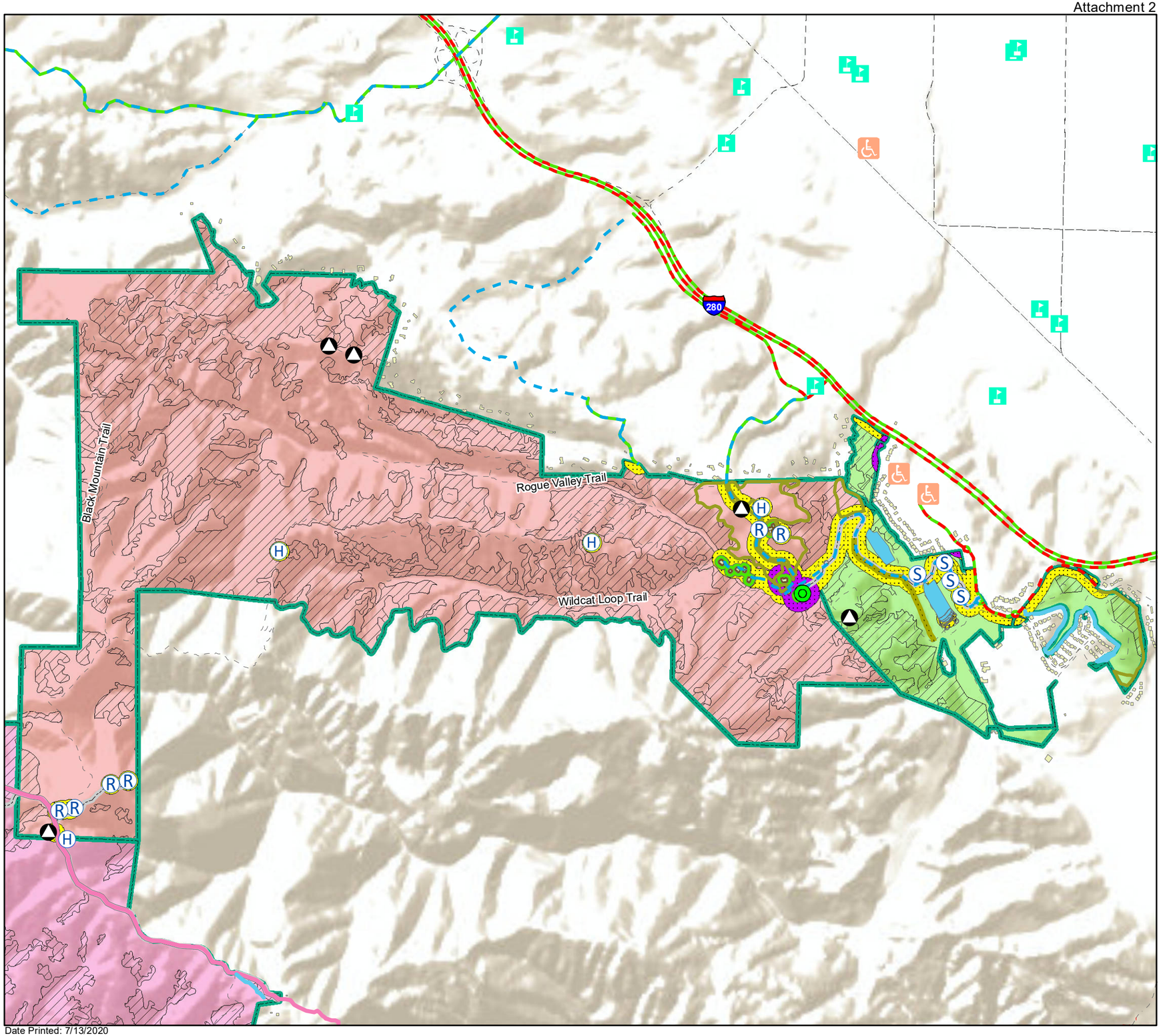

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Existing and Potential Treatments
Monte Bello

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail
- Communication
- Shelter-in-Place
- Water Tank

Target Hazards

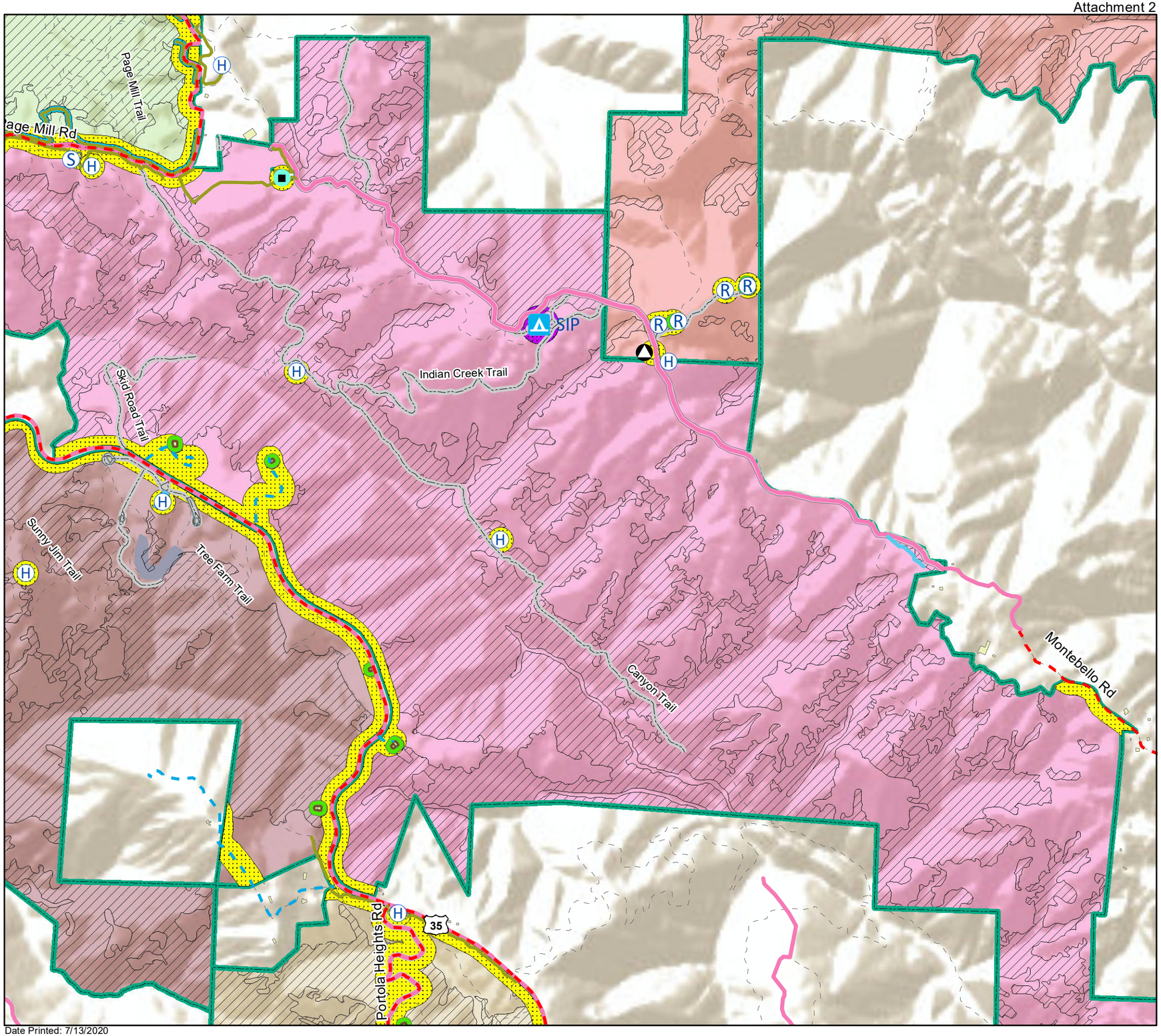
- Camp Site

Fire Management Logistics

- Helispot
- Lookout
- Staging Area

OSP & Managed Properties

- Boundary
- Foothills
- Long Ridge
- Los Trancos
- Monte Bello
- Rancho San Antonio
- Skyline Ridge



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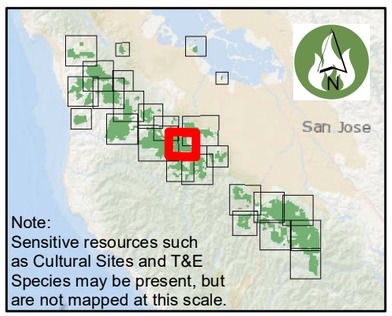


0 0.25 0.5 Miles

Existing and Potential Treatments
Long Ridge

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail

Target Hazards

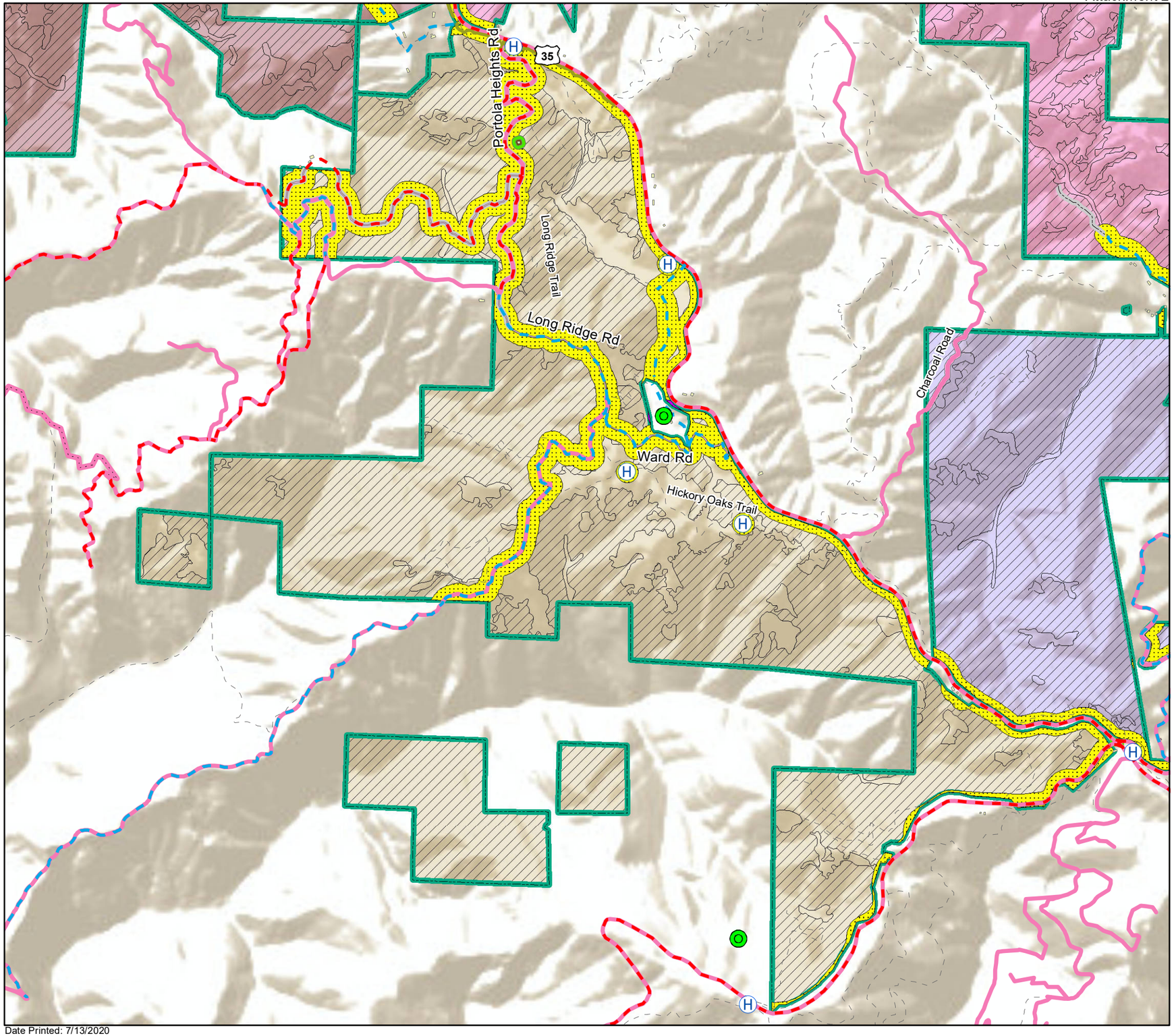
- Community Center

Fire Management Logistics

- Helispot

OSP & Managed Properties

- Boundary
- Long Ridge
- Monte Bello
- Saratoga Gap
- Skyline Ridge



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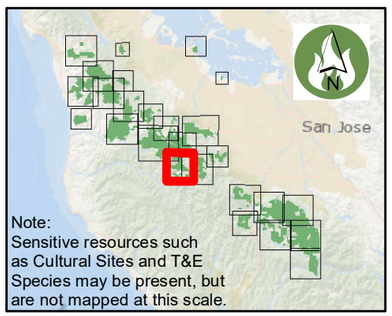


0 0.25 0.5 Miles

Existing and Potential Treatments
Saratoga Gap/Monte Bello/Long Ridge

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Fuelbreak 300-foot
- Eucalyptus and Acacia Removal
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Road or Trail

Target Hazards

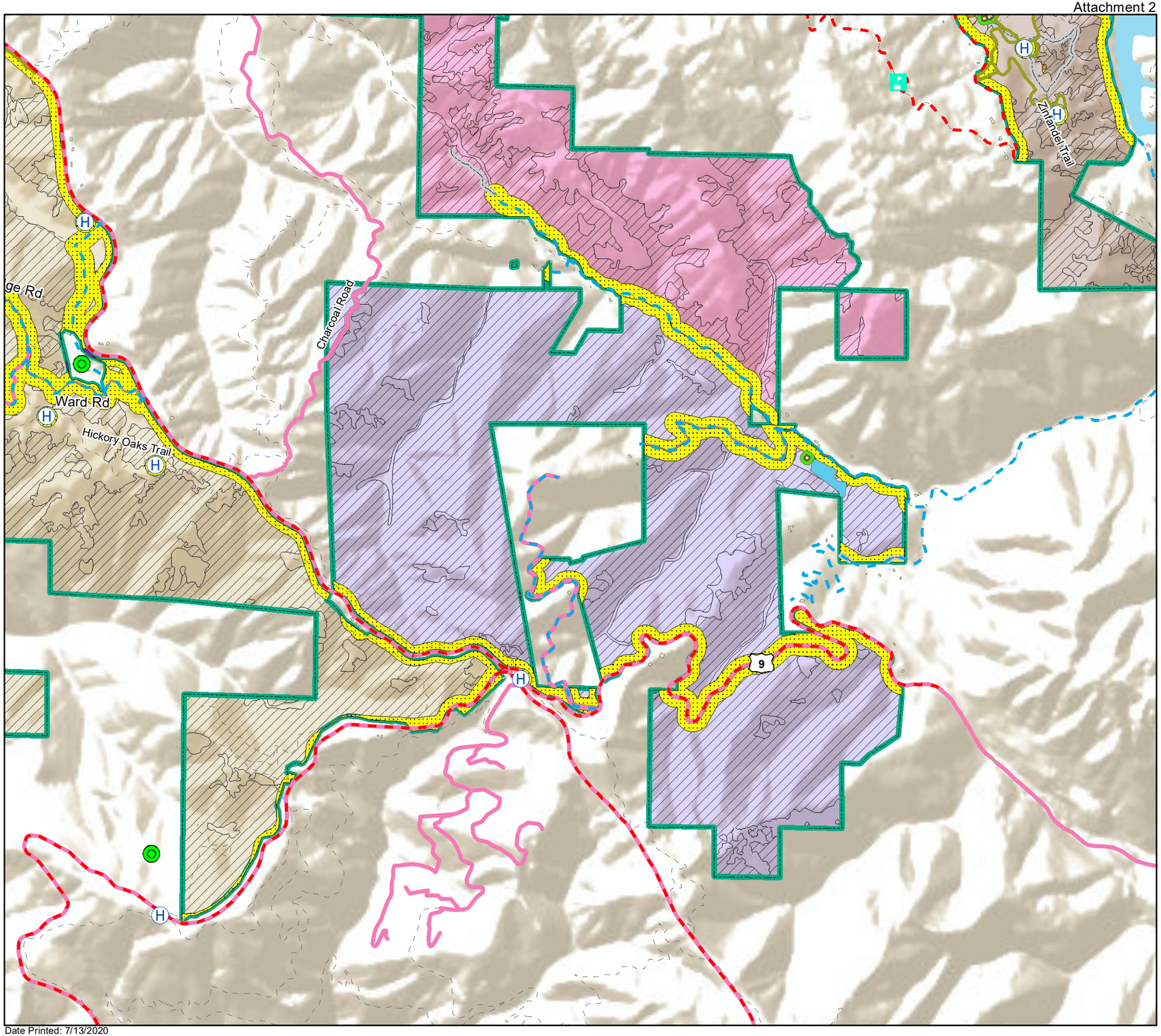
- Community Center
- School/Day Care

Fire Management Logistics

- Helispot

OSP & Managed Properties

- Boundary
- Long Ridge
- Monte Bello
- Picchetti Ranch
- Saratoga Gap



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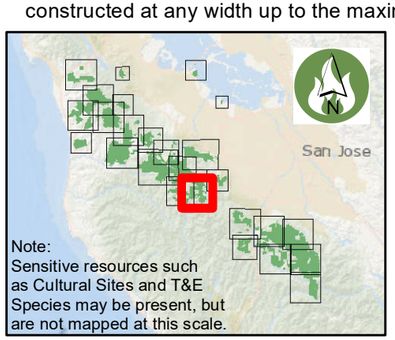


0 0.25 0.5 Miles

Existing and Potential Treatments
Fremont Older/Picchetti Ranch

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

Potential Fuels Treatments

- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Water Tank

Target Hazards

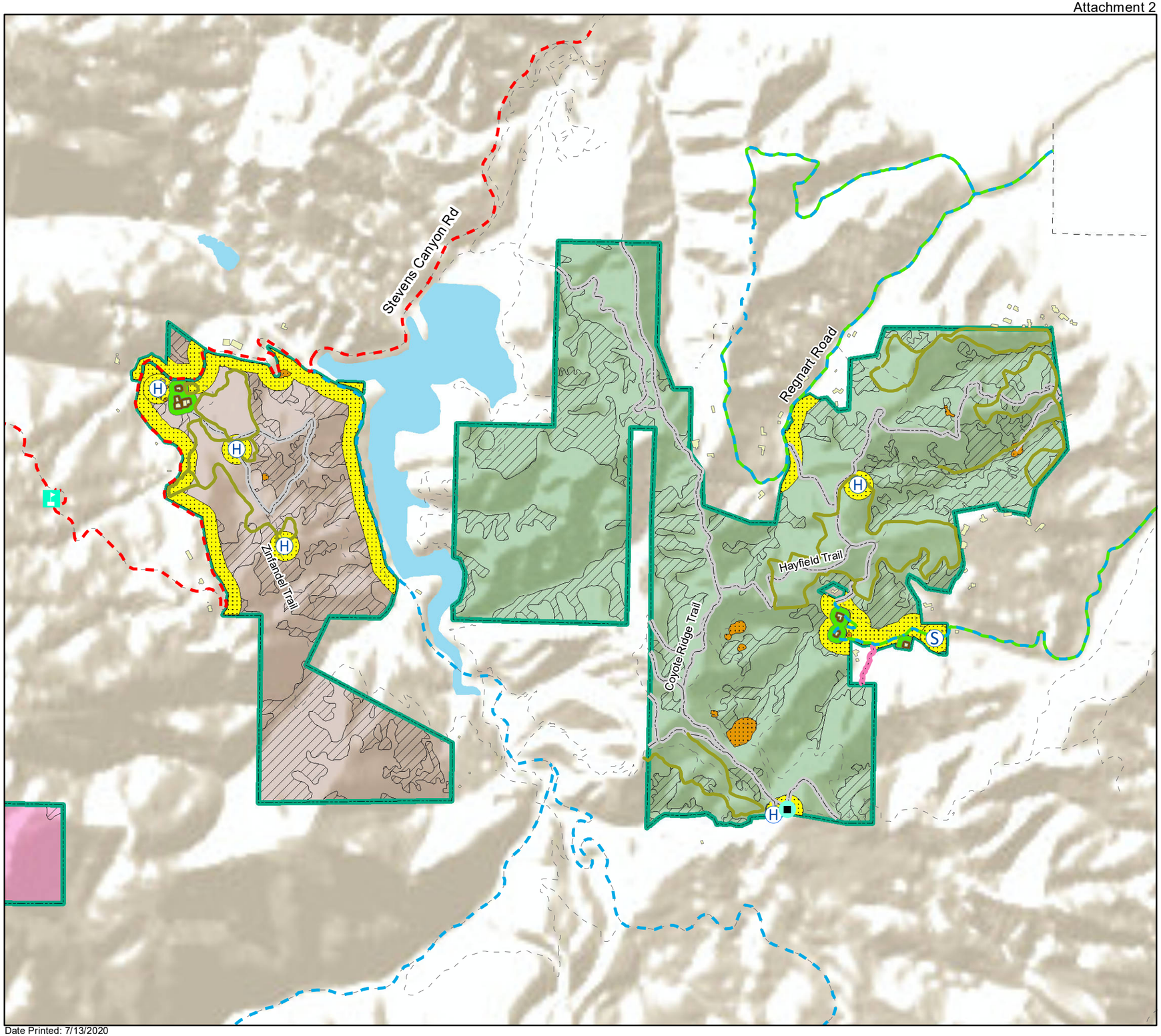
- School/Day Care

Fire Management Logistics

- Helispot
- Staging Area

OSP & Managed Properties

- Boundary
- Fremont Older
- Monte Bello
- Picchetti Ranch



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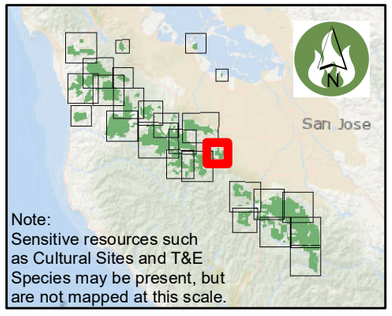

0 0.25 0.5 Miles

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Existing and Potential Treatments
El Sereno/Felton Station/St. Joseph's Hill

Existing Treatments
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline
- Wildland Type 3 Ingress/Egress

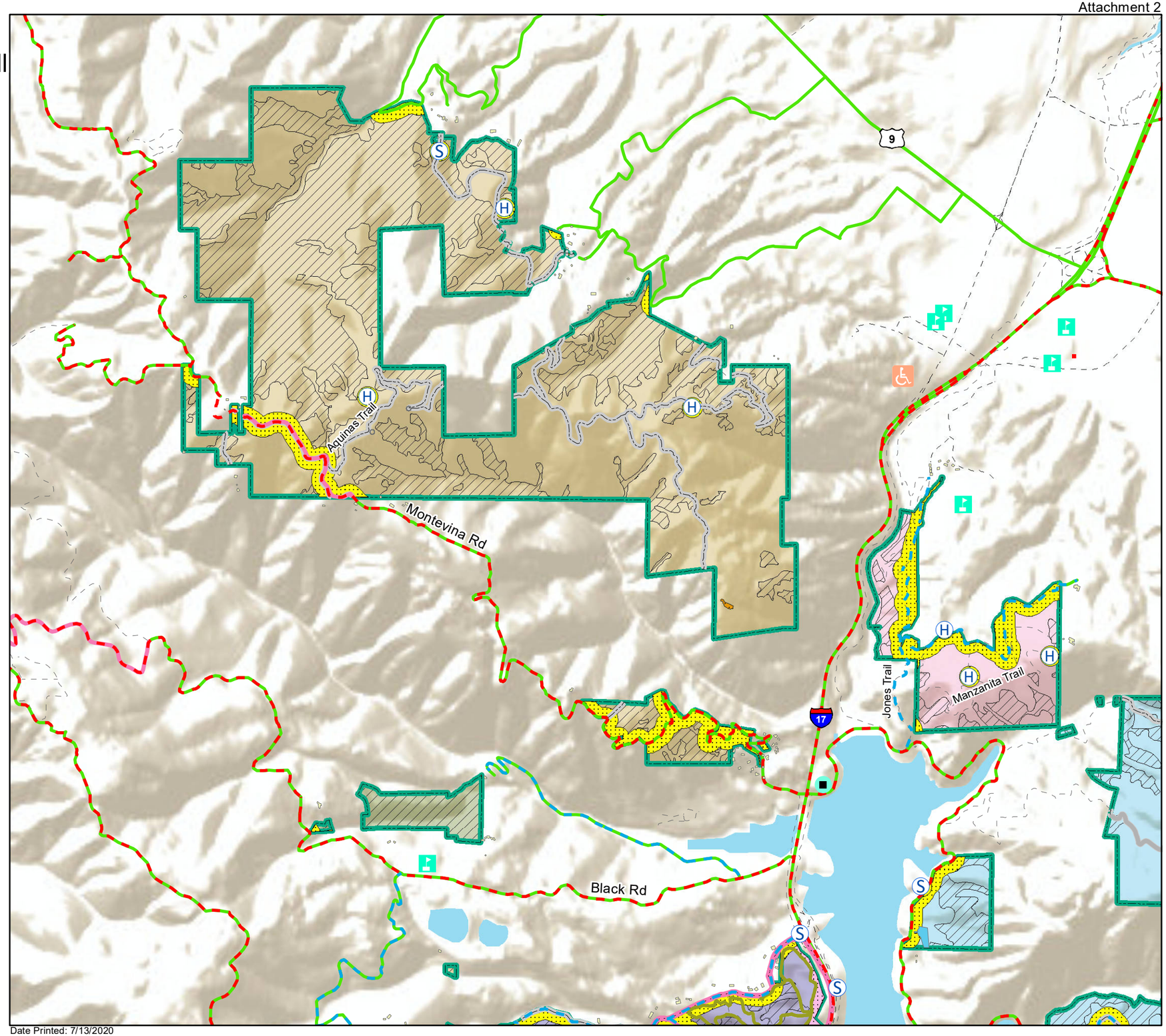
Potential Fuels Treatments
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Water Tank

Target Hazards
- Assisted Living Facility
- School/Day Care

Fire Management Logistics
- Helispot
- Staging Area

OSP & Managed Properties
- Boundary
- Bear Creek Redwoods
- El Sereno
- Felton Station
- Sierra Azul
- St. Joseph's Hill



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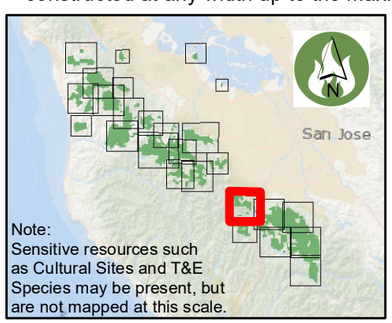

0 0.25 0.5 Miles

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Existing and Potential Treatments
Bear Creek Redwoods

Existing Treatments
- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline

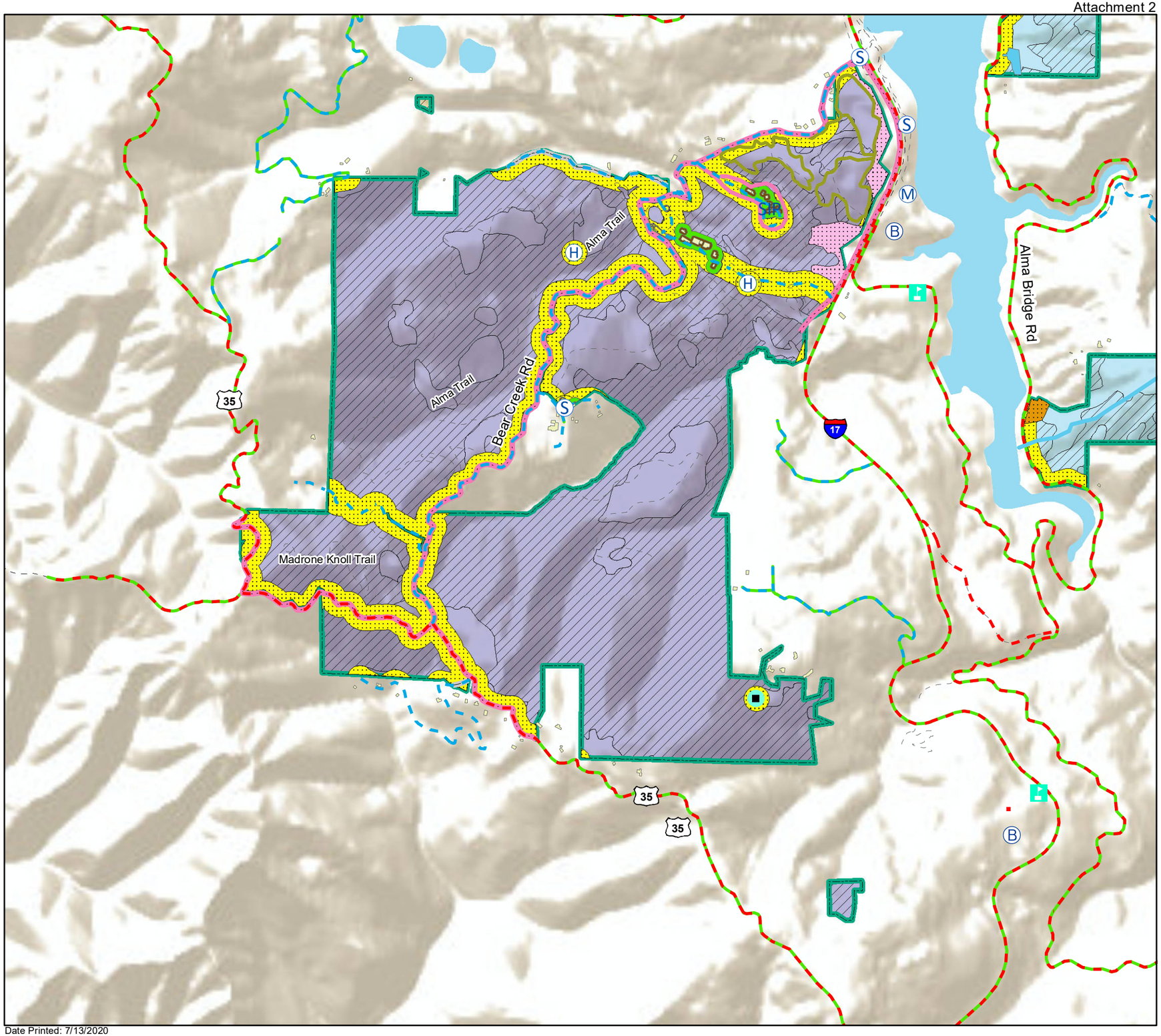
Potential Fuels Treatments
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Ⓑ Incident Command Post
- Ⓜ Medivac Site
- SIP Shelter-in-Place
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Ⓗ Helispot
- Ⓢ Staging Area

OSP & Managed Properties
- Boundary
- Bear Creek Redwoods
- El Sereno
- Sierra Azul



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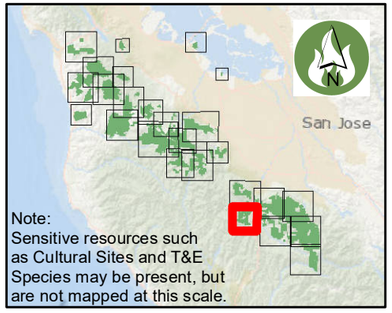


0 0.25 0.5 Miles

Existing and Potential Treatments
Sierra Azul (1 of 5)

Existing Treatments
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline
- Wildland Type 3 Ingress/Egress

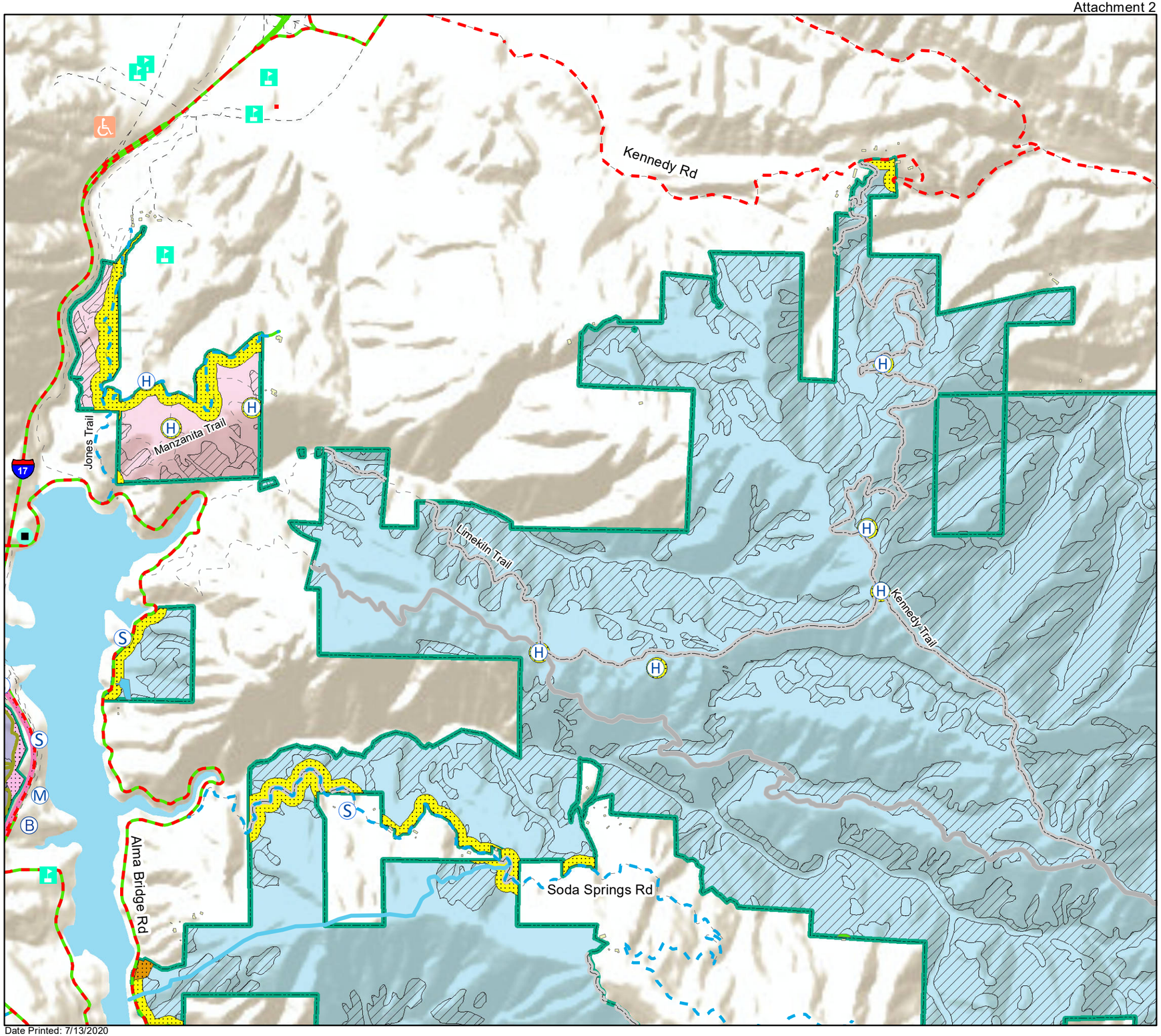
Potential Fuels Treatments
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Incident Command Post
- Medivac Site
- Water Tank

Target Hazards
- Assisted Living Facility
- School/Day Care

Fire Management Logistics
- Helispot
- Staging

OSP & Managed Properties
- Boundary
- Bear Creek Redwoods
- Sierra Azul
- St. Joseph's Hill



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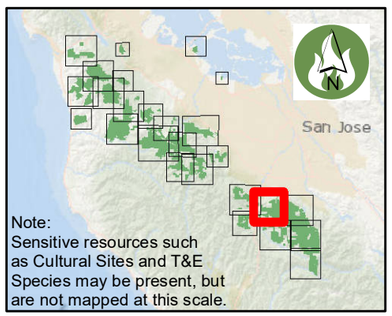

0 0.25 0.5 Miles

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Existing and Potential Treatments
Sierra Azul (2 of 5)

Existing Treatments
- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Discline
- Wildland Type 3 Ingress/Egress

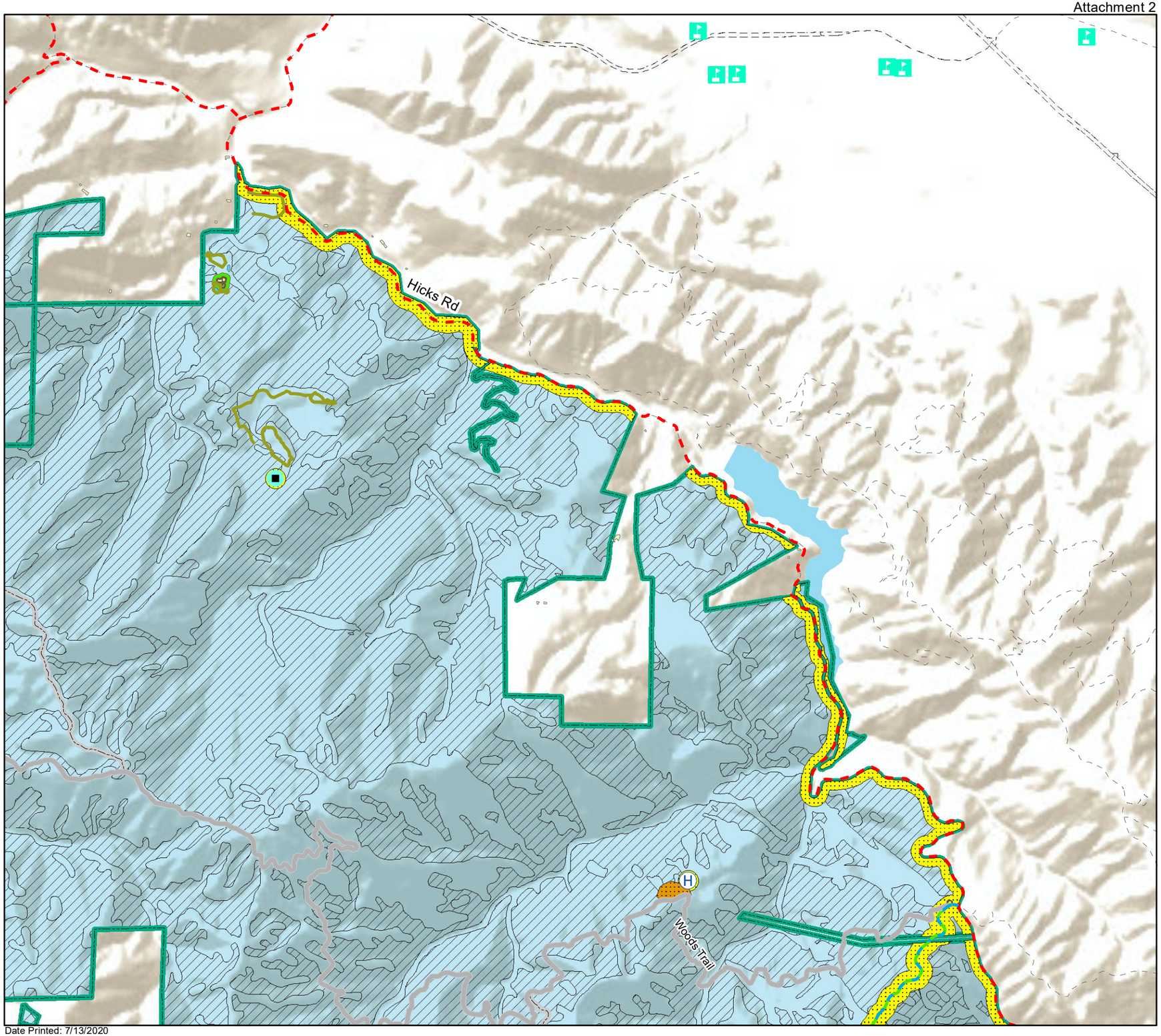
Potential Fuels Treatments
- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Sierra Azul



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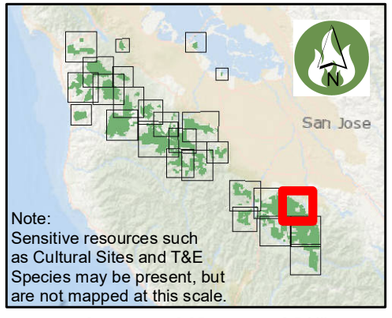


Existing and Potential Treatments
Sierra Azul (3 of 5)

Existing Treatments
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Wildland Type 3 Ingress/Egress

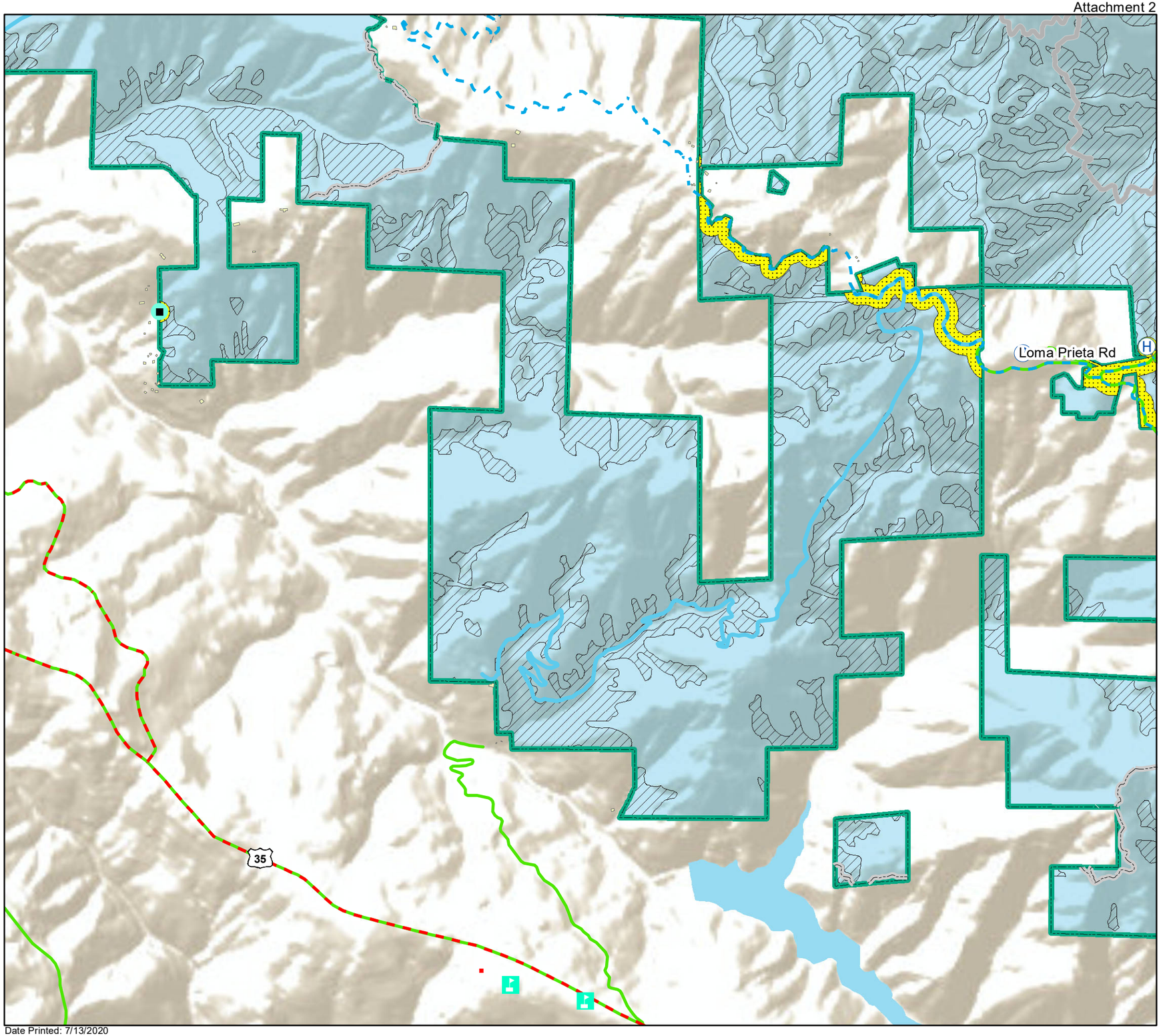
Potential Fuels Treatments
- Fuelbreak 200-foot
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Communication
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Sierra Azul



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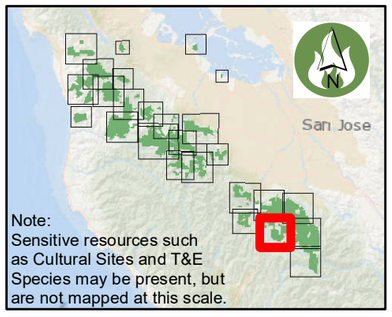


Existing and Potential Treatments
Sierra Azul (4 of 5)

Existing Treatments

- Defensible Space 30-foot
- Defensible Space 100-foot
- Fuelbreak 200-foot
- Non-Shaded Fuelbreak
- Shaded Fuelbreak
- Wildland Type 3 Ingress/Egress

Potential Fuels Treatments

- Fuelbreak 200-foot
- Eucalyptus and Acacia Removal
- Shaded Fuelbreak
- Fire Agency Recommended
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress

Critical Infrastructure

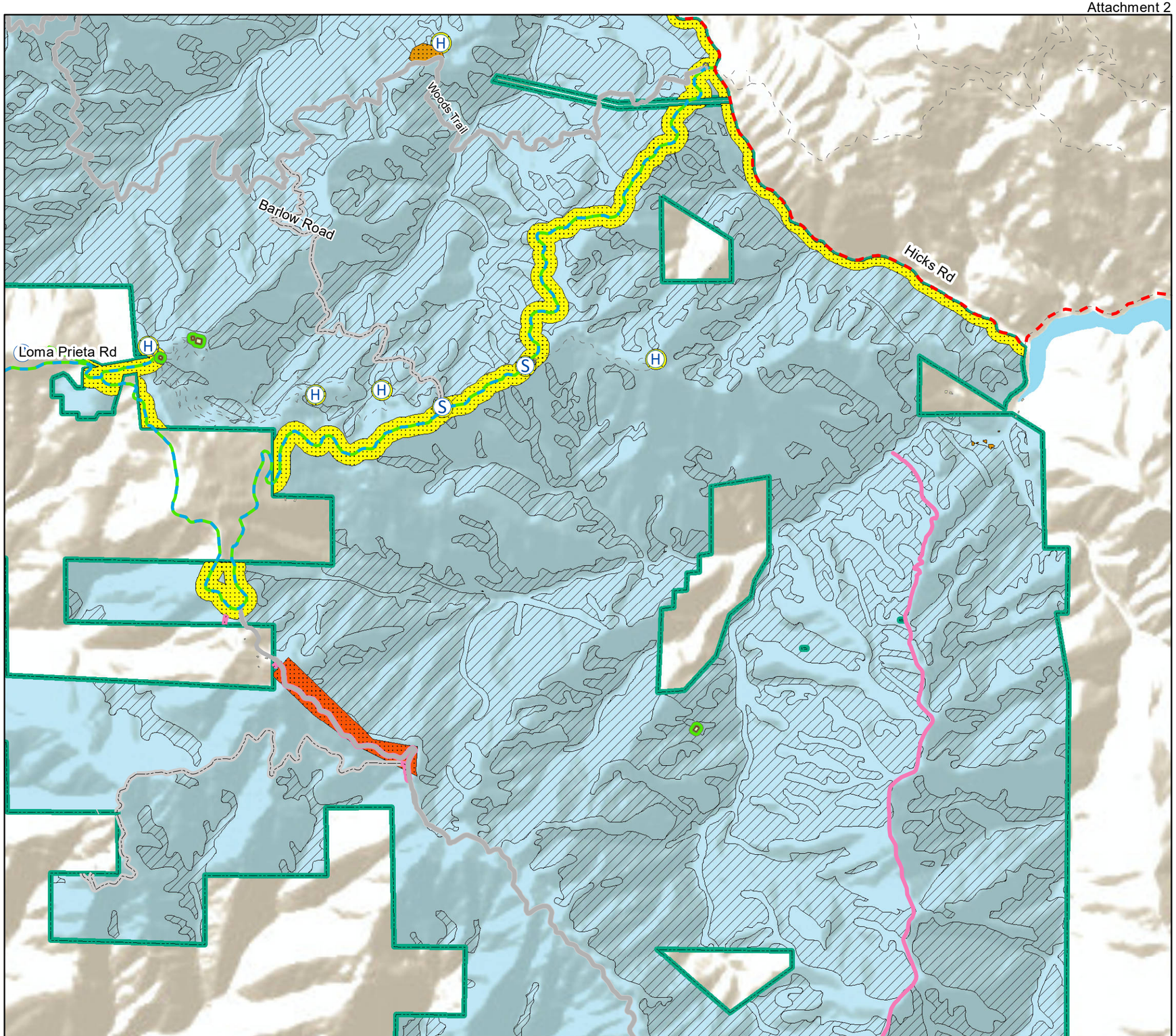
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Communication

Fire Management Logistics

- Helispot
- Staging Area

OSP & Managed Properties

- Boundary
- Sierra Azul



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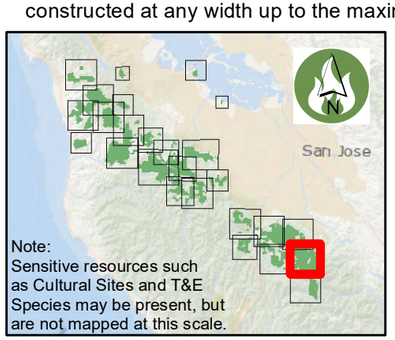


0 0.25 0.5 Miles

Existing and Potential Treatments
Sierra Azul (5 of 5)

Existing Treatments

- Shaded Fuelbreak
- Wildland Type 3 Ingress/Egress

Potential Fuels Treatments

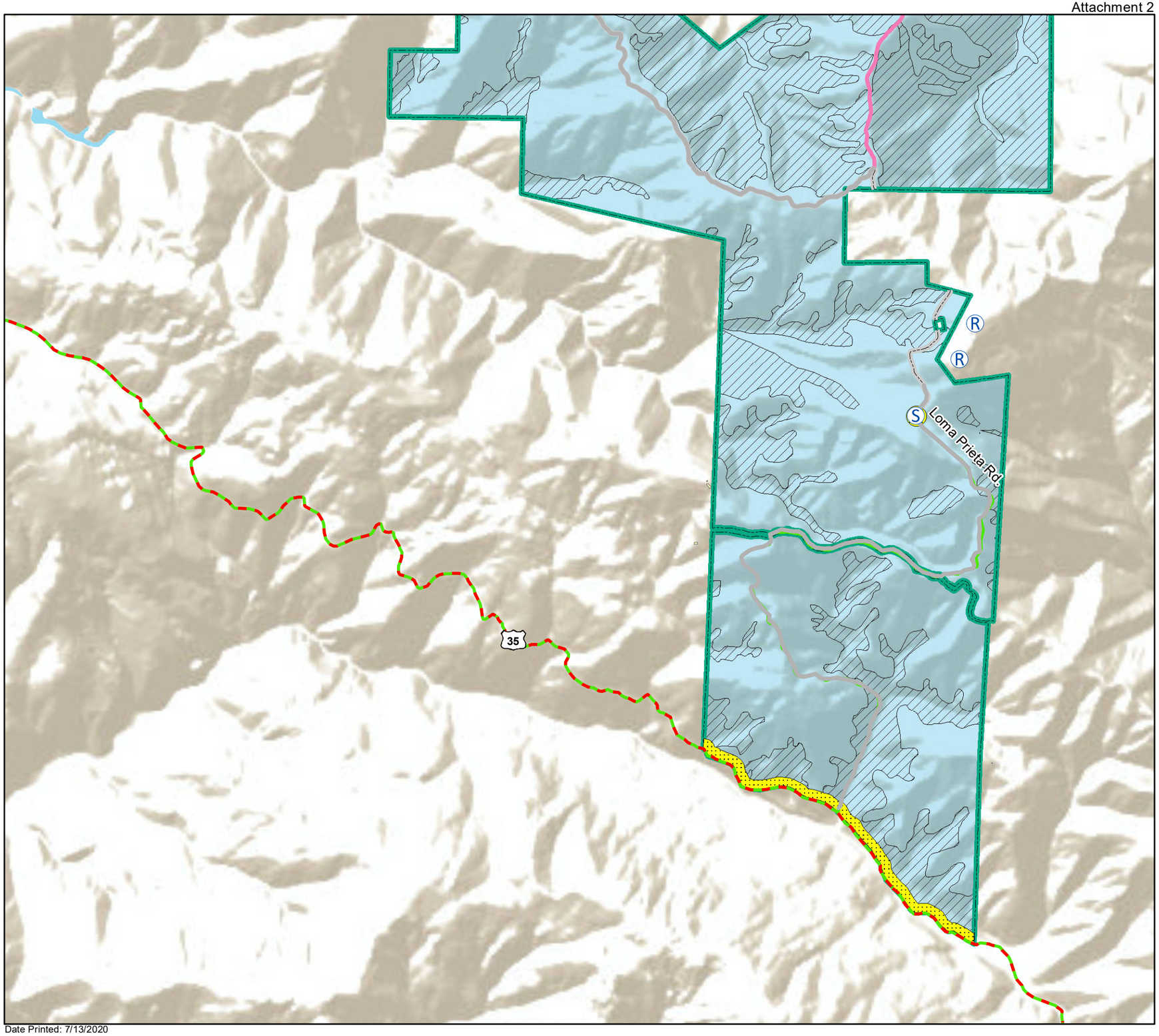
- Fuelbreak 200-foot
- Potential FRAs for Ecosystem Resiliency
- Wildland Type 3 Ingress/Egress
- Structure Type 1 (Tender)
- Ⓡ Communication

Fire Management Logistics

- Ⓢ Staging Area

OSP & Managed Properties

- Boundary
- Sierra Azul



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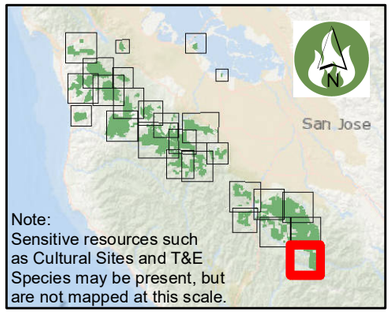

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Existing and Potential Treatments
Ravenswood

Road or Trail

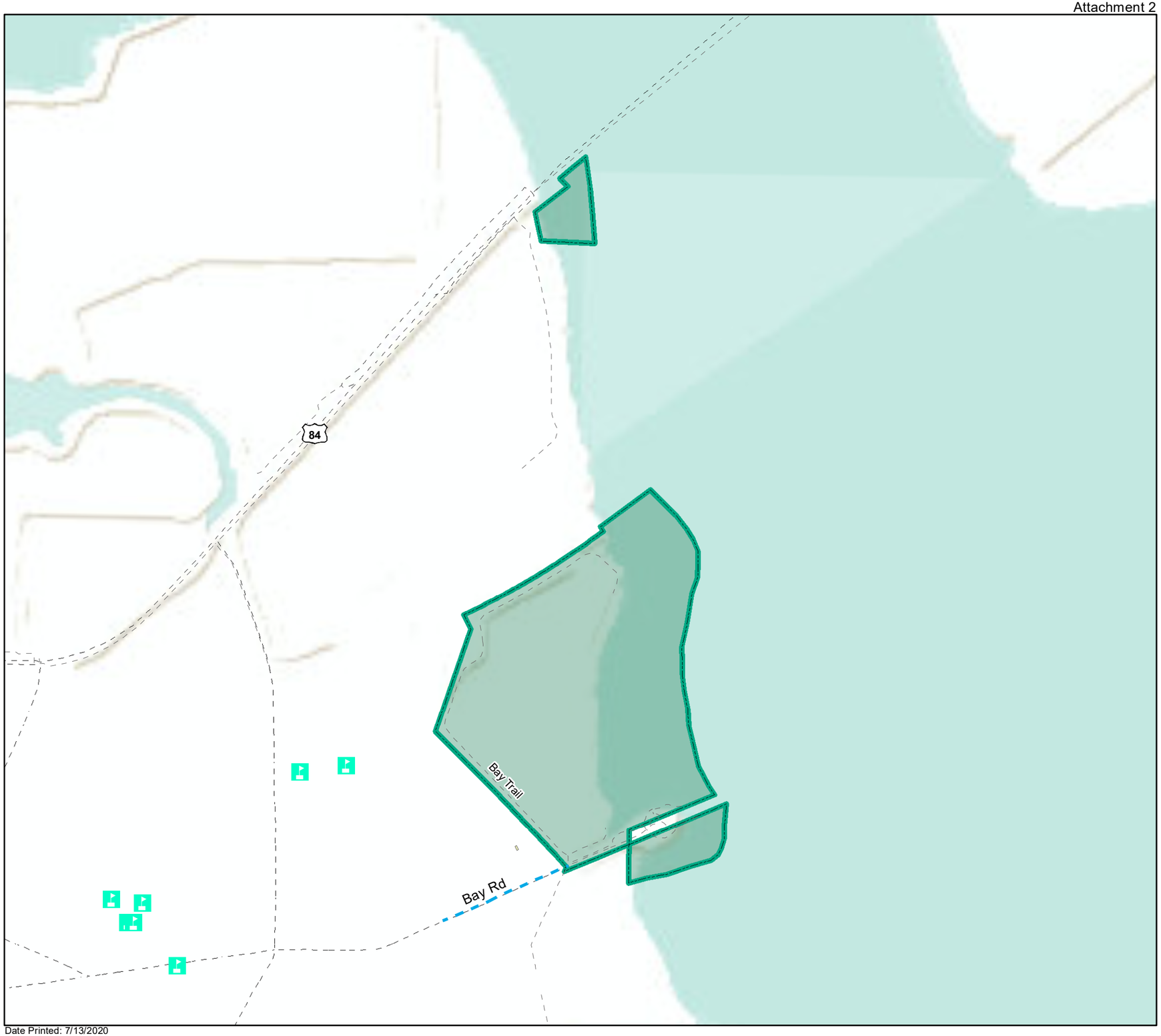
Target Hazards

School/Day Care

OSP & Managed Properties

Boundary

Ravenswood



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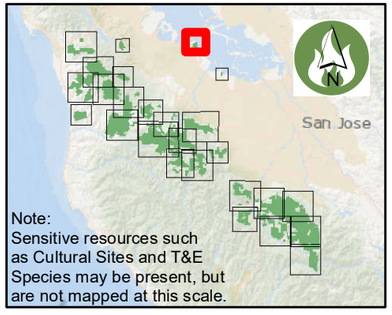

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Existing and Potential Treatments
Stevens Creek Shoreline NSA

Road or Trail

OSP & Managed Properties

Boundary

Stevens Creek Shoreline Nature Study Area



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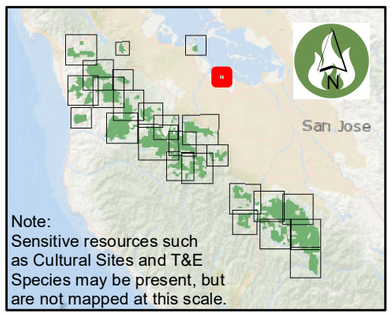

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Appendix 3.0-1b Tier 1 and Tier 2 Prioritized Treatments (Overlaid on Topographic Maps)

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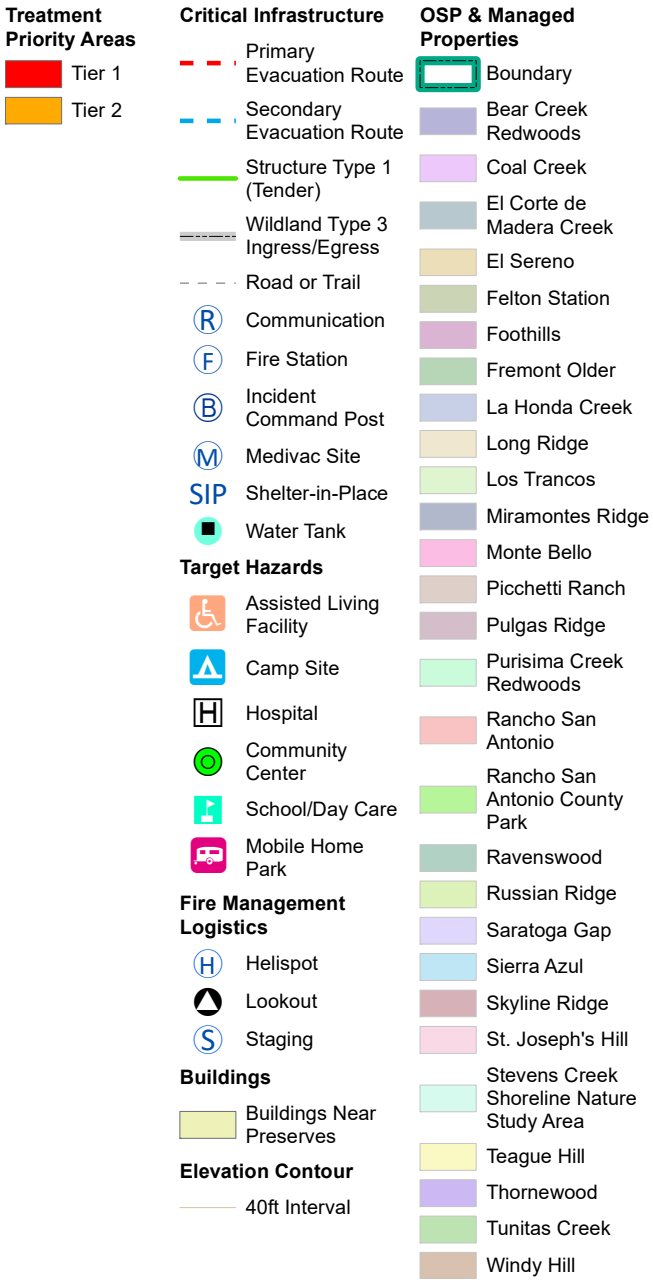


These maps are for reference only. Although every effort has been made to ensure the accuracy of information, errors and conditions originating from physical sources used to develop the data may be reflected on this map. Midpeninsula Regional Open Space District shall not be liable for any errors, omissions, or damages that result from inappropriate use of this document.

Treatment Priorities
Miramontes Ridge

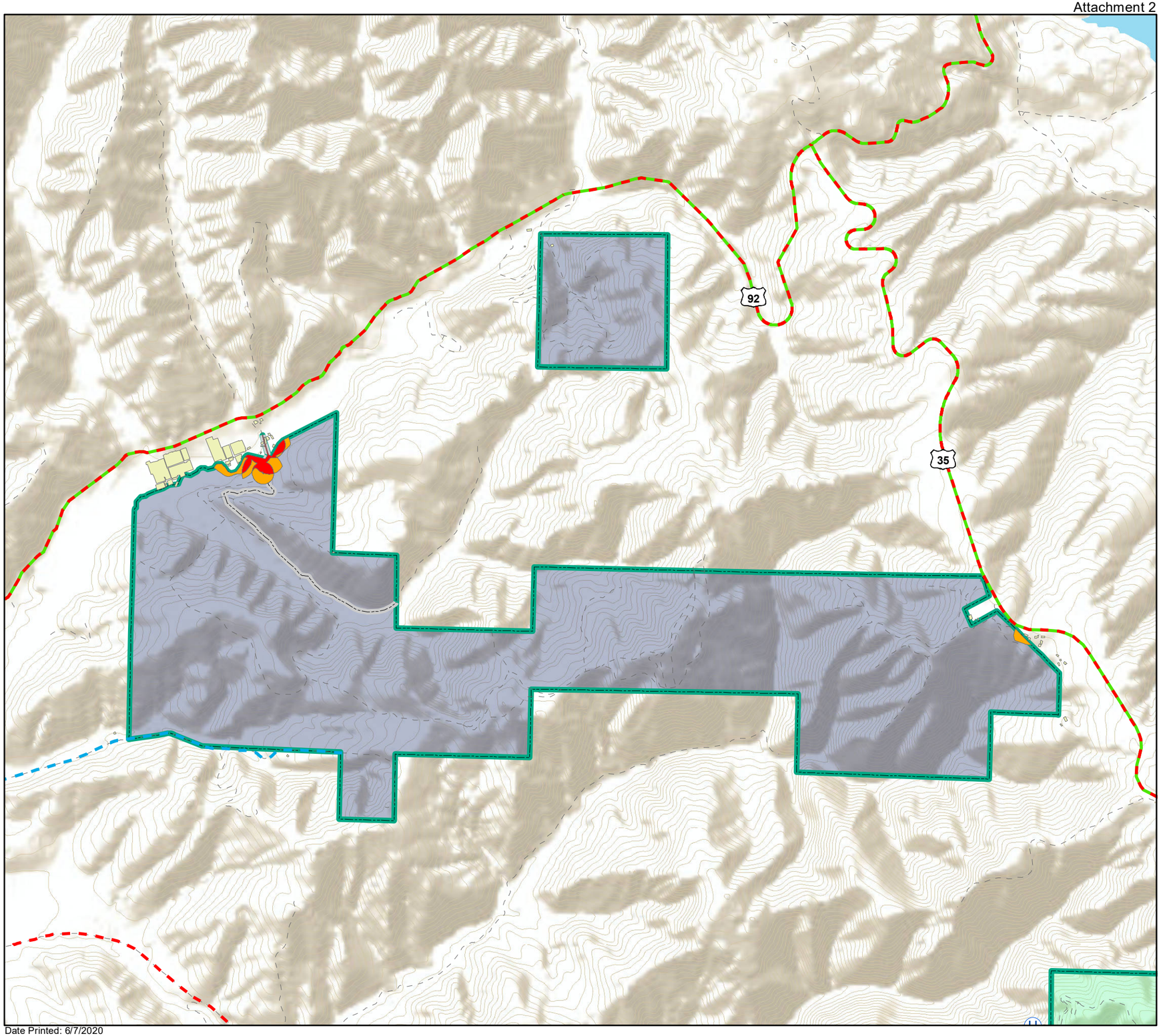
Treatment Priority Areas
- Tier 1
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Miramontes Ridge
- Purisima Creek Redwoods



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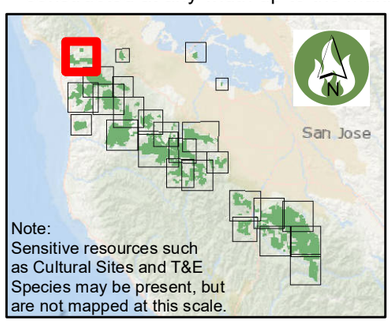

0 0.25 0.5 Miles

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Treatment Priorities
Pulgas Ridge

Treatment Priority Areas
- Tier 1
- Tier 2

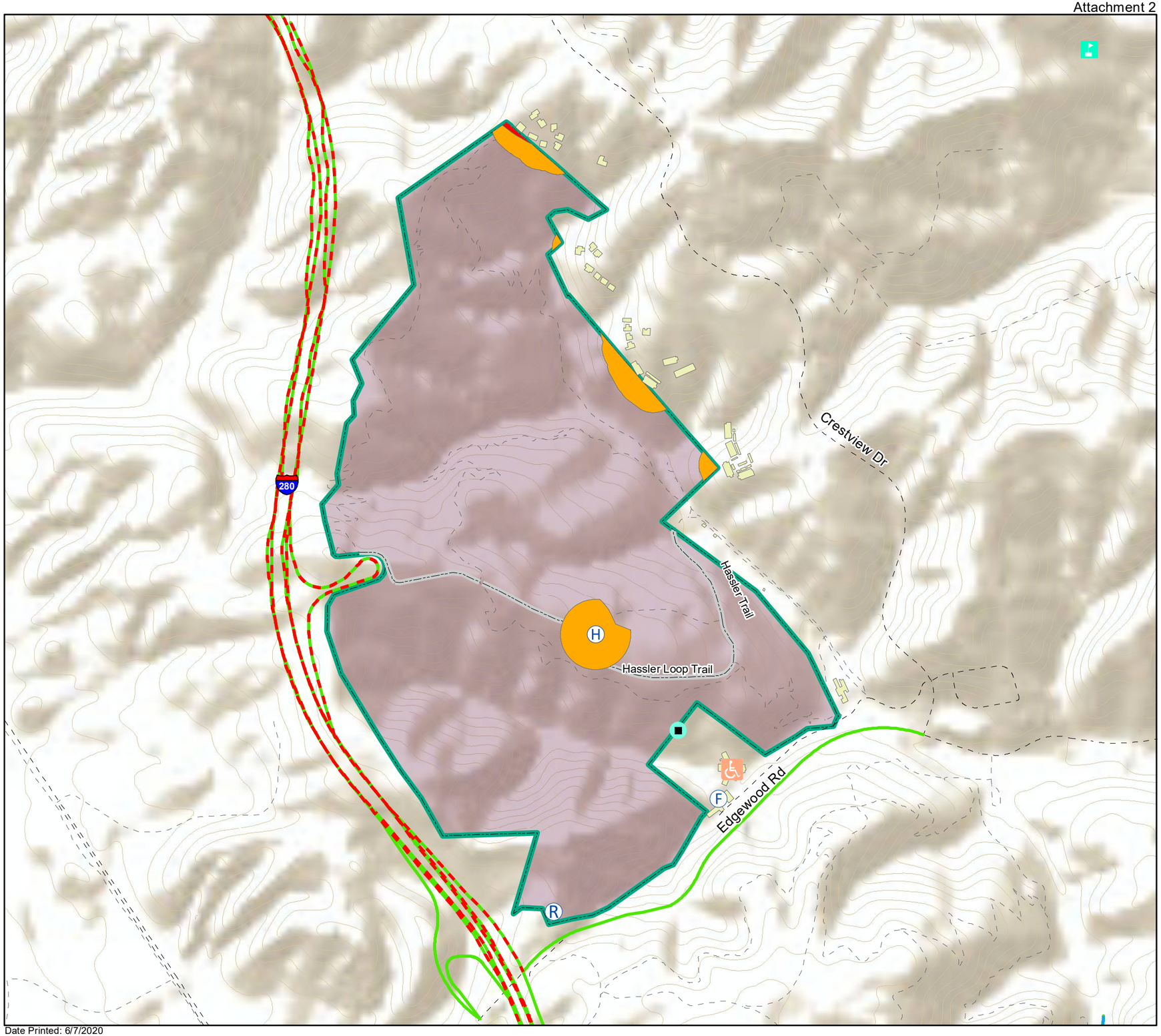
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Fire Station
- Water Tank

Target Hazards
- Assisted Living Facility
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Pulgas Ridge



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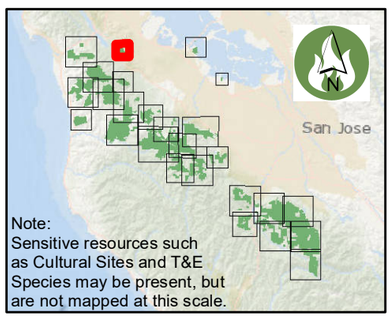

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Treatment Priorities
Purisima Creek Redwoods

Treatment Priority Areas
- Tier 1
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Fire Station
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- El Corte de Madera Creek
- Purisima Creek Redwoods

* See Table of Contents page for additional symbology.
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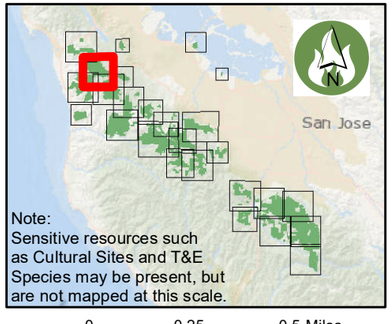

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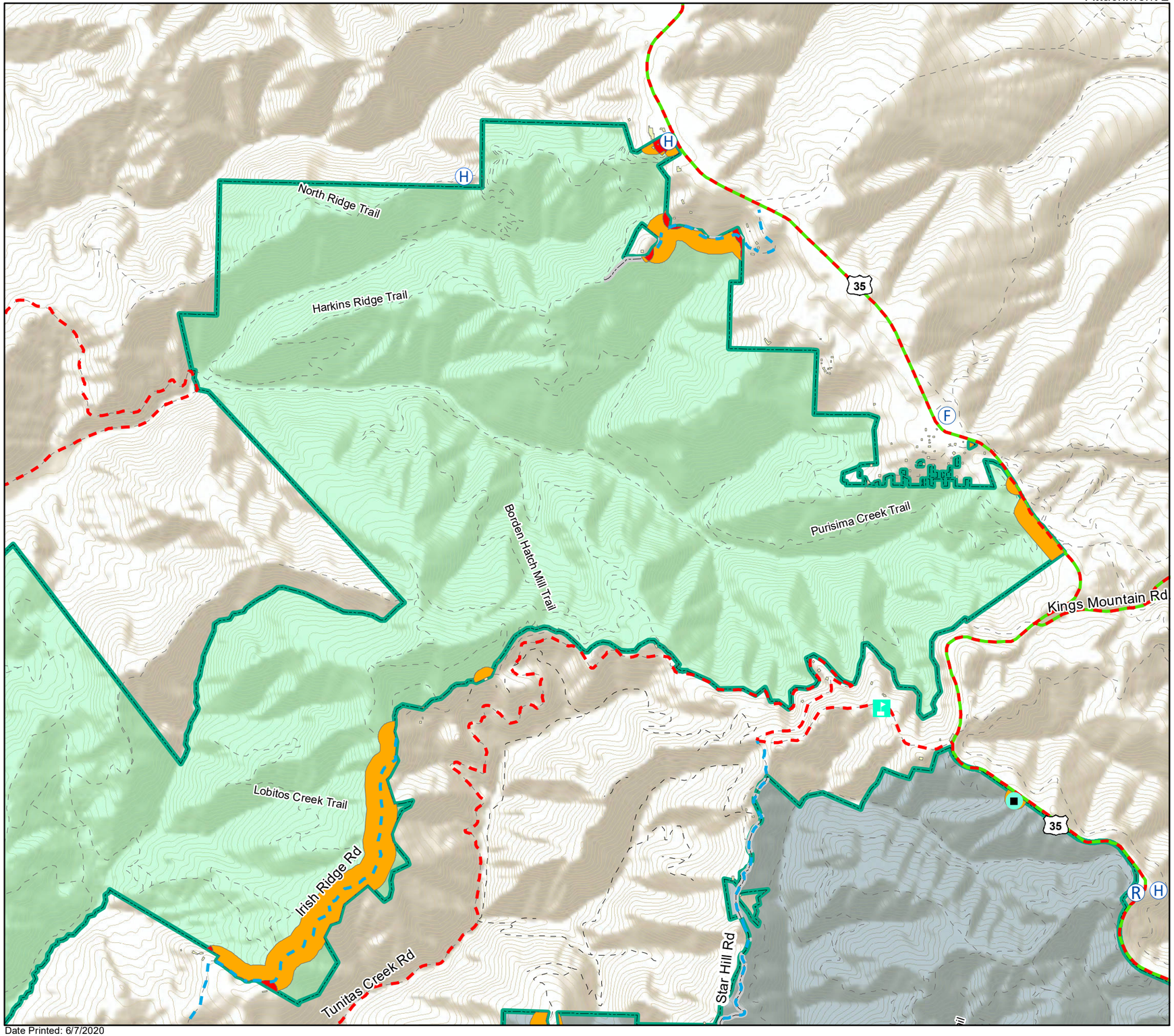

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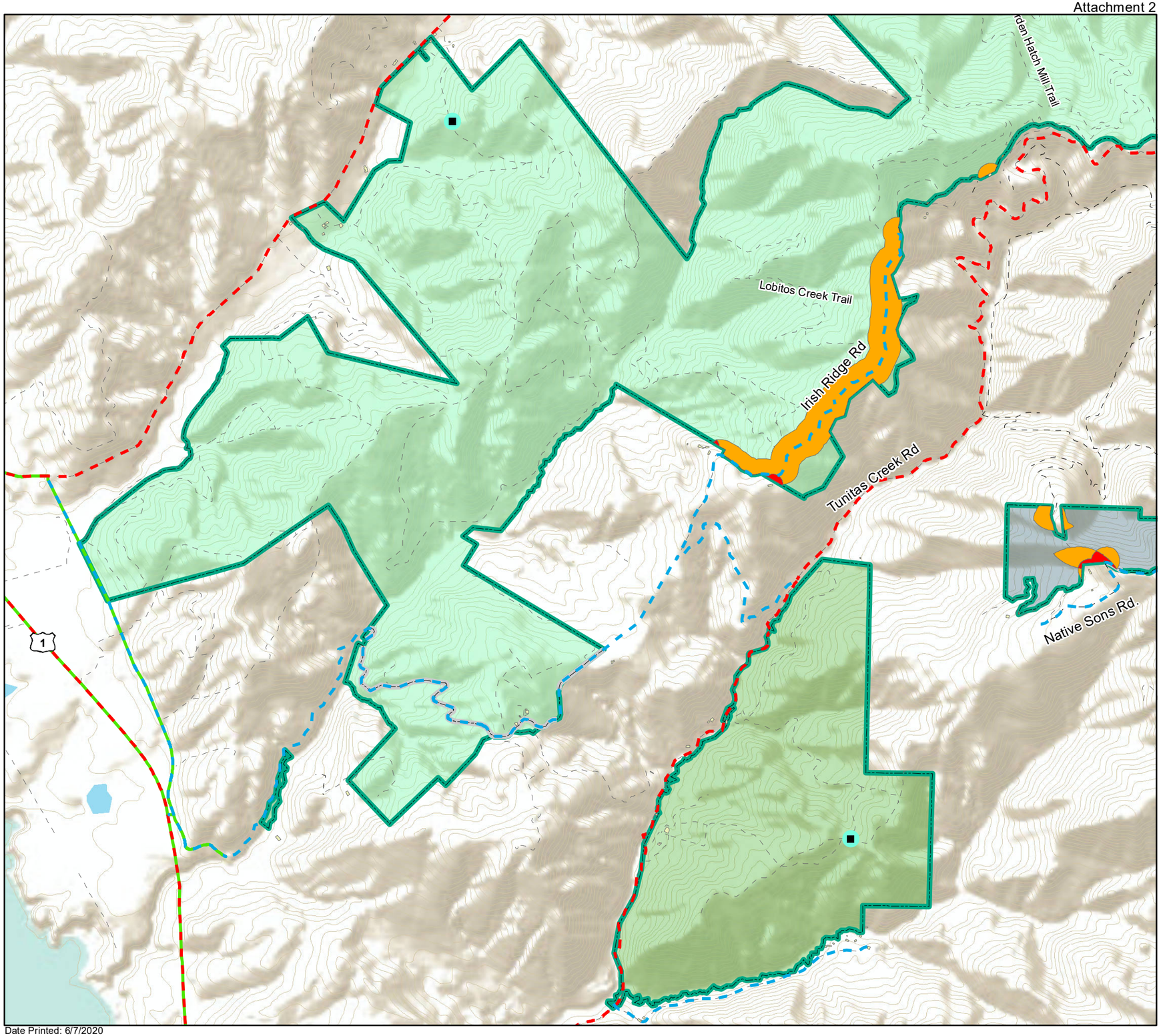
Treatment Priorities
Purisima Creek/Tunitas Creek

Treatment Priority Areas
- Tier 1
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Water Tank

OSP & Managed Properties
- Boundary
- El Corte de Madera Creek
- Purisima Creek Redwoods
- Tunitas Creek



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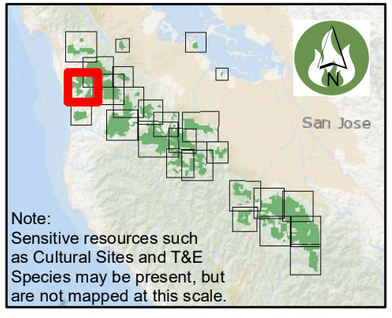

0 0.25 0.5 Miles

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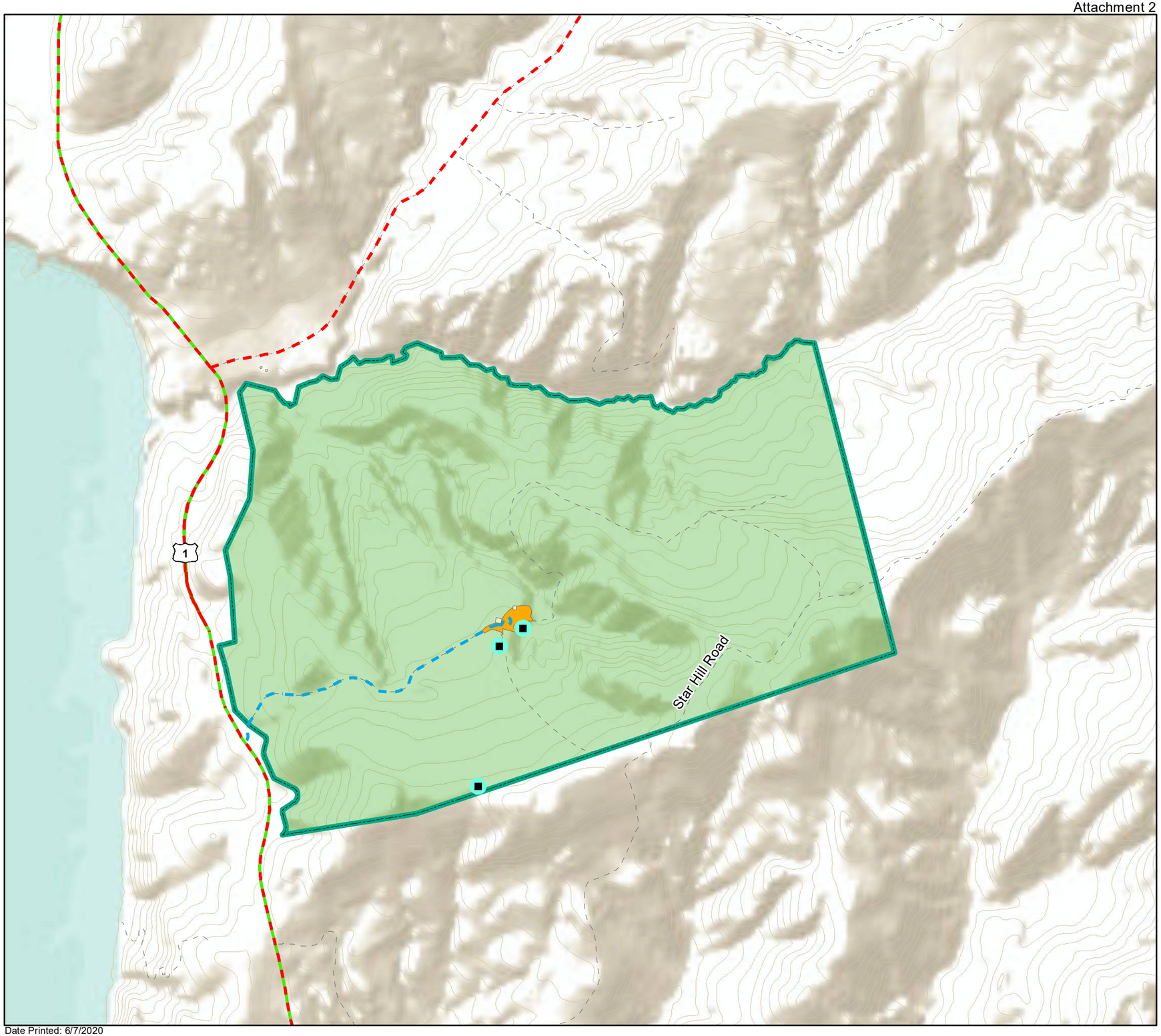
Treatment Priorities
Tunitas Creek

Treatment Priority Areas
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Water Tank

OSP & Managed Properties
- Boundary
- Tunitas Creek



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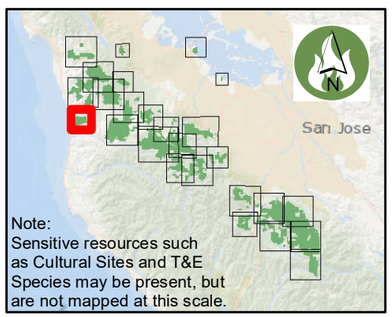


0 0.25 0.5 Miles

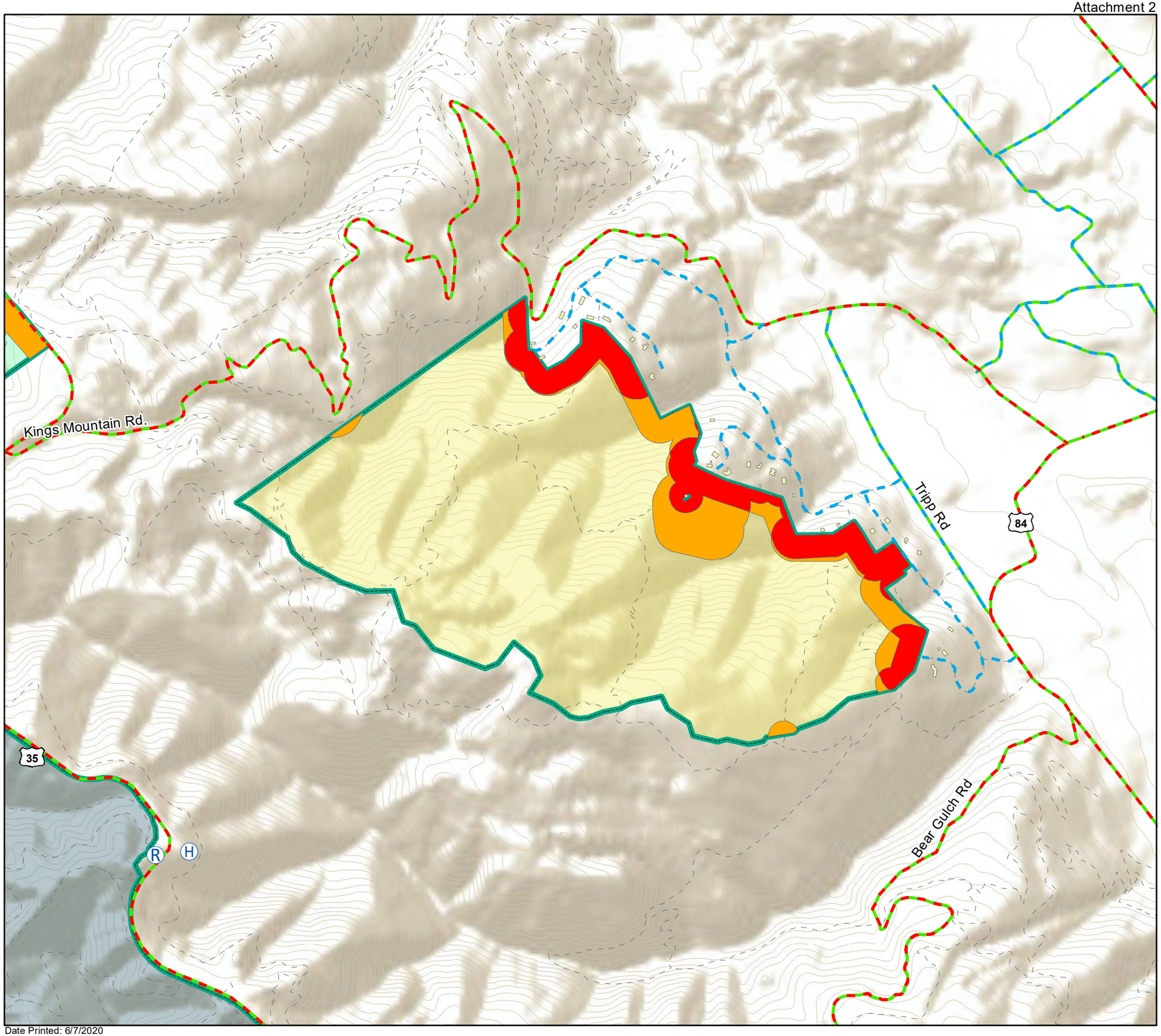
Treatment Priorities
Teague Hill

Treatment Priority Areas
- Tier 1
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)
- Road or Trail
- Communication

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- El Corte de Madera Creek
- Purisima Creek Redwoods
- Teague Hill



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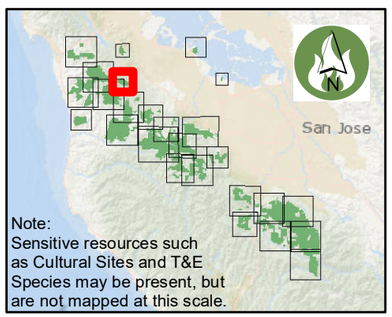


0 0.25 0.5 Miles

Treatment Priorities
El Corte de Madera Creek

Treatment Priority Areas
- Tier 1
- Tier 2

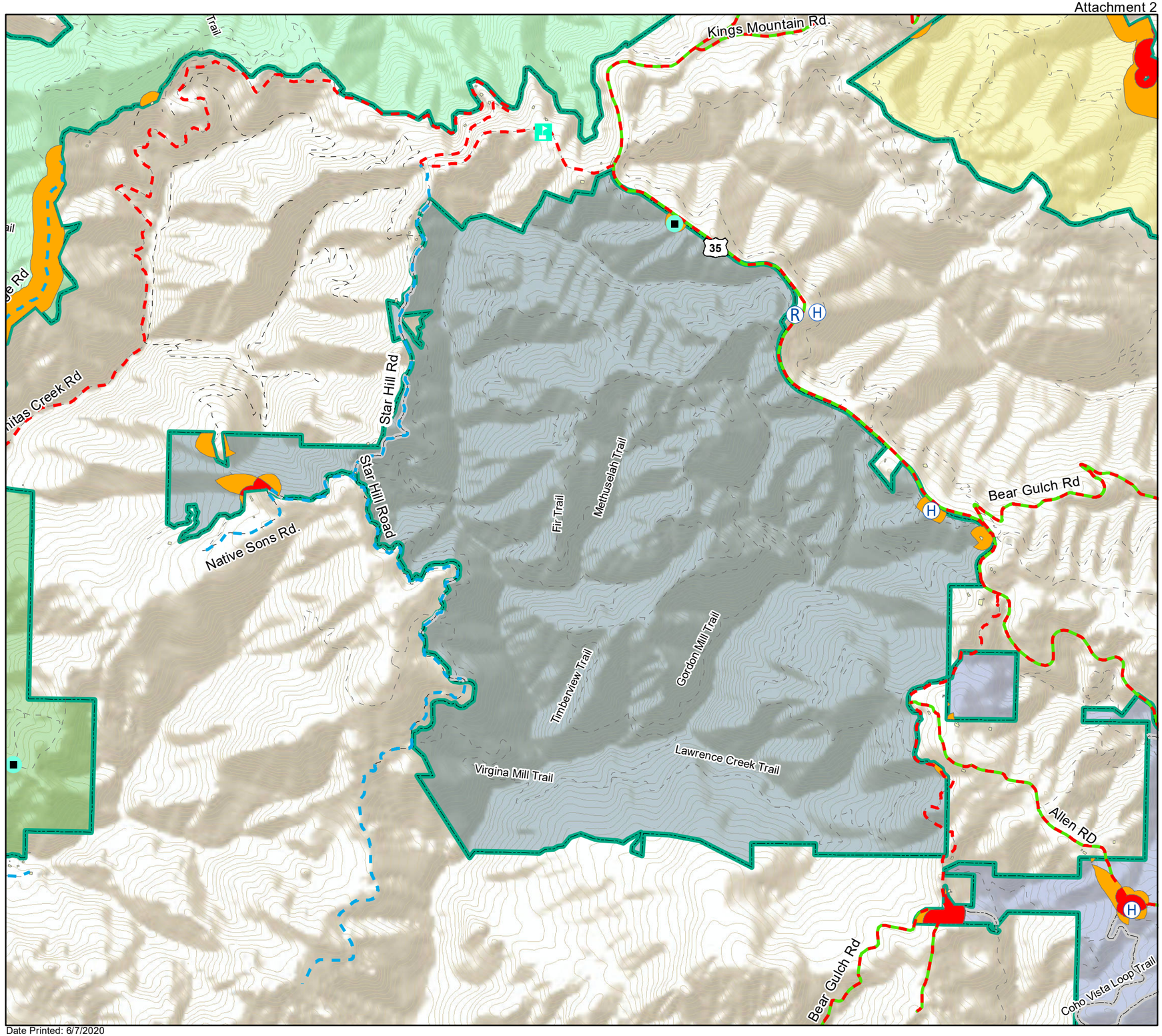
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- El Corte de Madera Creek
- La Honda Creek
- Purisima Creek Redwoods
- Teague Hill
- Tunitas Creek



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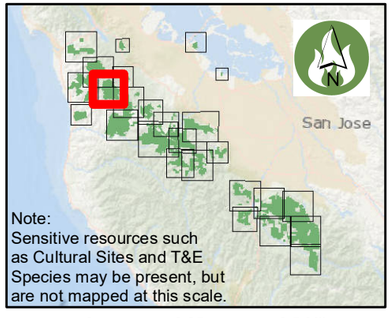


0 0.25 0.5 Miles

Treatment Priorities
La Honda Creek/Thornewood

Treatment Priority Areas
- Tier 1
- Tier 2

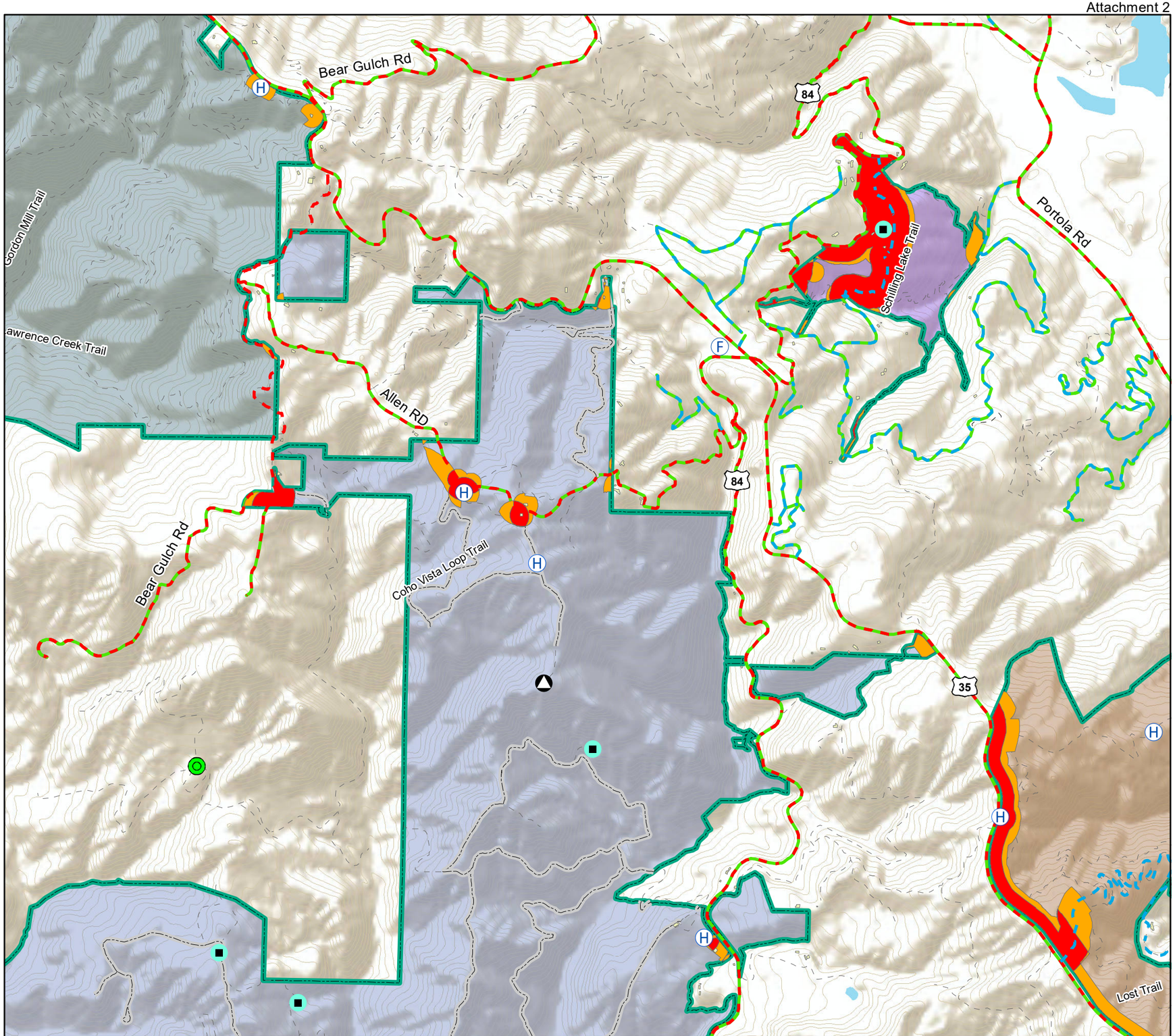
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station
- Water Tank

Target Hazards
- Community Center

Fire Management Logistics
- Helispot
- Lookout

OSP & Managed Properties
- Boundary
- El Corte de Madera Creek
- La Honda Creek
- Thornewood
- Windy Hill



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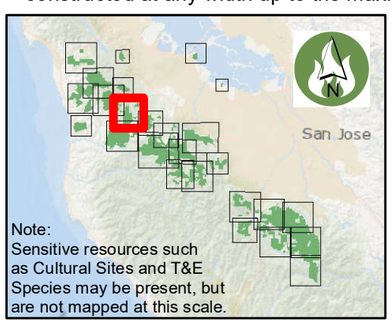


0 0.25 0.5 Miles

Treatment Priorities
La Honda Creek

Treatment Priority Areas
- Tier 1
- Tier 2

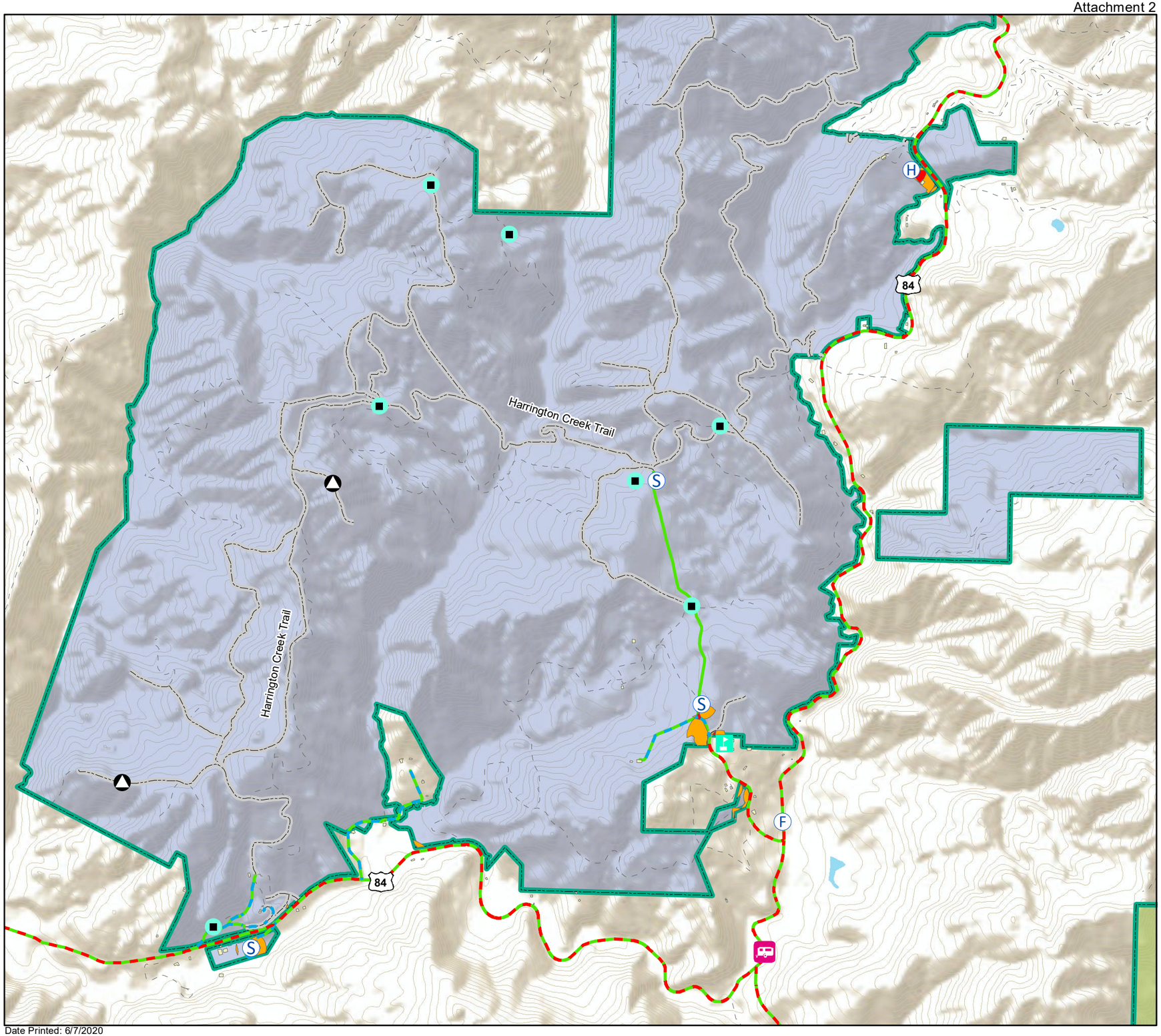
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station
- Water Tank

Target Hazards
- School/Day Care
- Mobile Home Park

Fire Management Logistics
- Helispot
- Lookout
- Staging Area

OSP & Managed Properties
- Boundary
- La Honda Creek
- Russian Ridge



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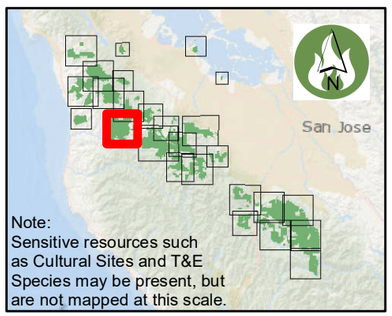


0 0.25 0.5 Miles

Treatment Priorities
Windy Hill

Treatment Priority Areas
- Tier 1
- Tier 2

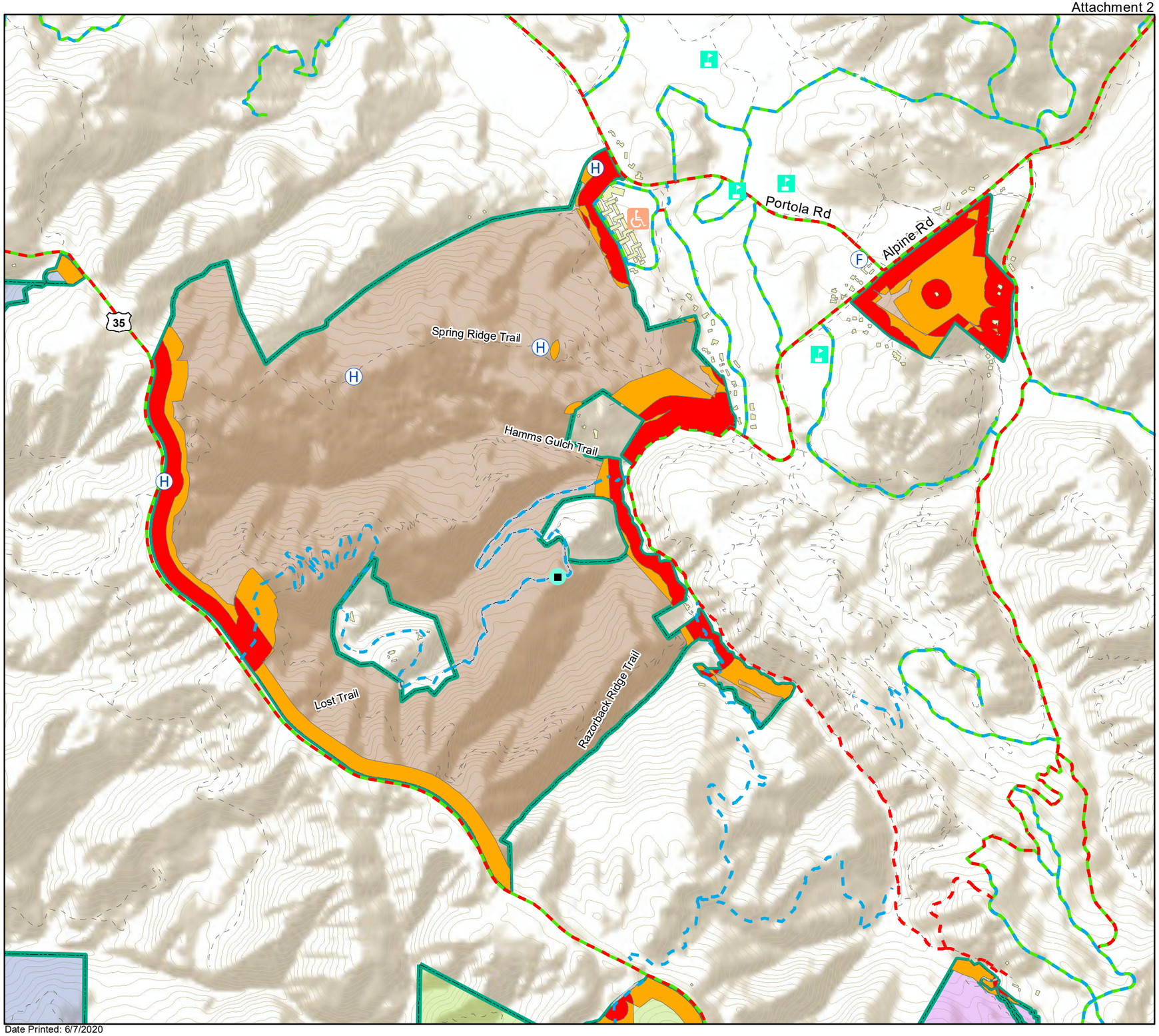
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station
- Water Tank

Target Hazards
- Assisted Living Facility
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Coal Creek
- La Honda Creek
- Russian Ridge
- Windy Hill



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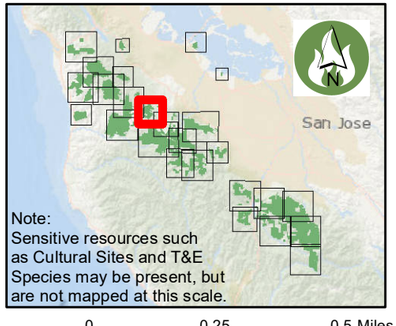

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Treatment Priorities
Russian Ridge/Coal Creek/Skyline Ridge

Treatment Priority Areas
- Tier 1
- Tier 2

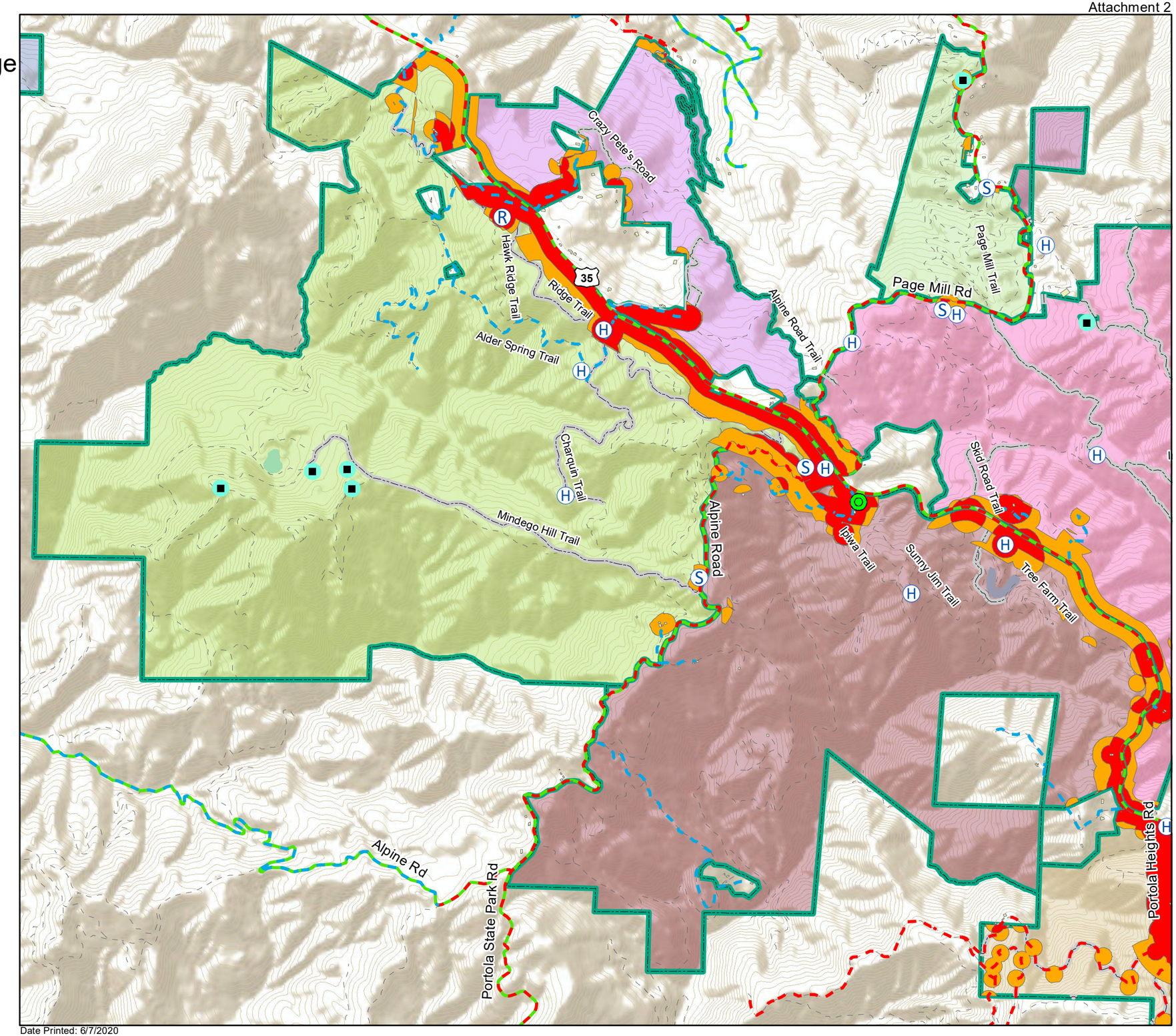
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Water Tank

Target Hazards
- Community Center

Fire Management Logistics
- Helispot
- Staging

OSP & Managed Properties
- Boundary
- Coal Creek
- Foothills
- La Honda Creek
- Long Ridge
- Los Trancos
- Monte Bello
- Russian Ridge
- Skyline Ridge



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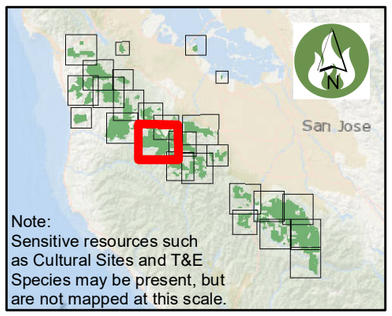


0 0.25 0.5 Miles

Treatment Priorities
Coal Creek/Foothills/Los Trancos

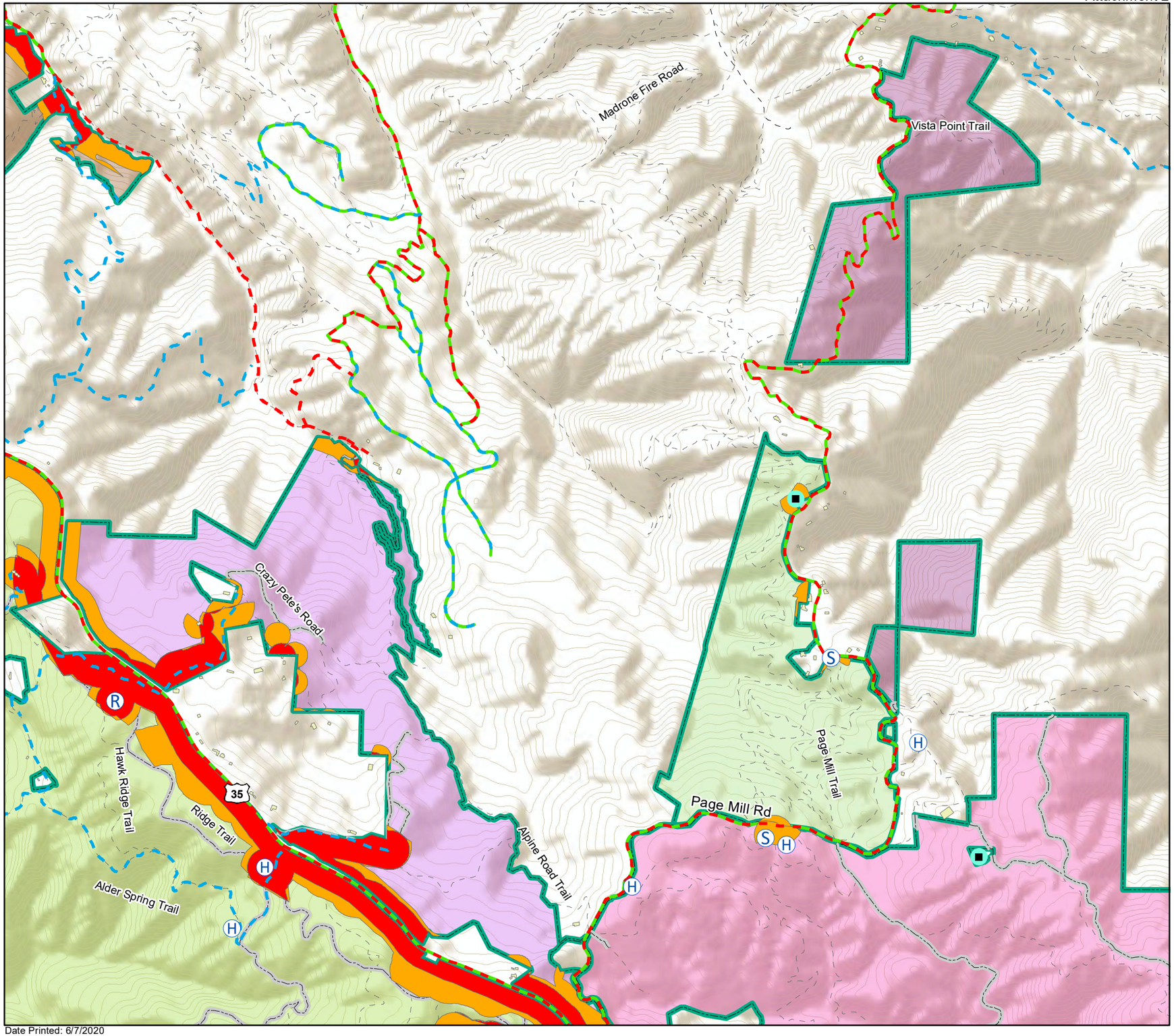
Treatment Priority Areas
- Tier 1
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Water Tank

Fire Management Logistics
- Helispot
- Staging Area

OSP & Managed Properties
- Boundary
- Coal Creek
- Foothills
- Los Trancos
- Monte Bello
- Russian Ridge
- Windy Hill



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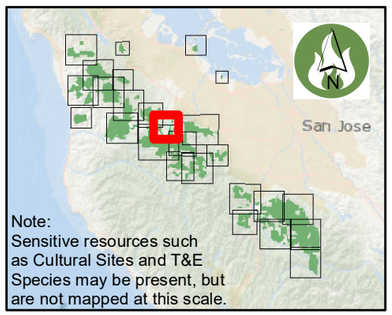


0 0.25 0.5 Miles

Treatment Priorities
Rancho San Antonio

Treatment Priority Areas
- Tier 1
- Tier 2

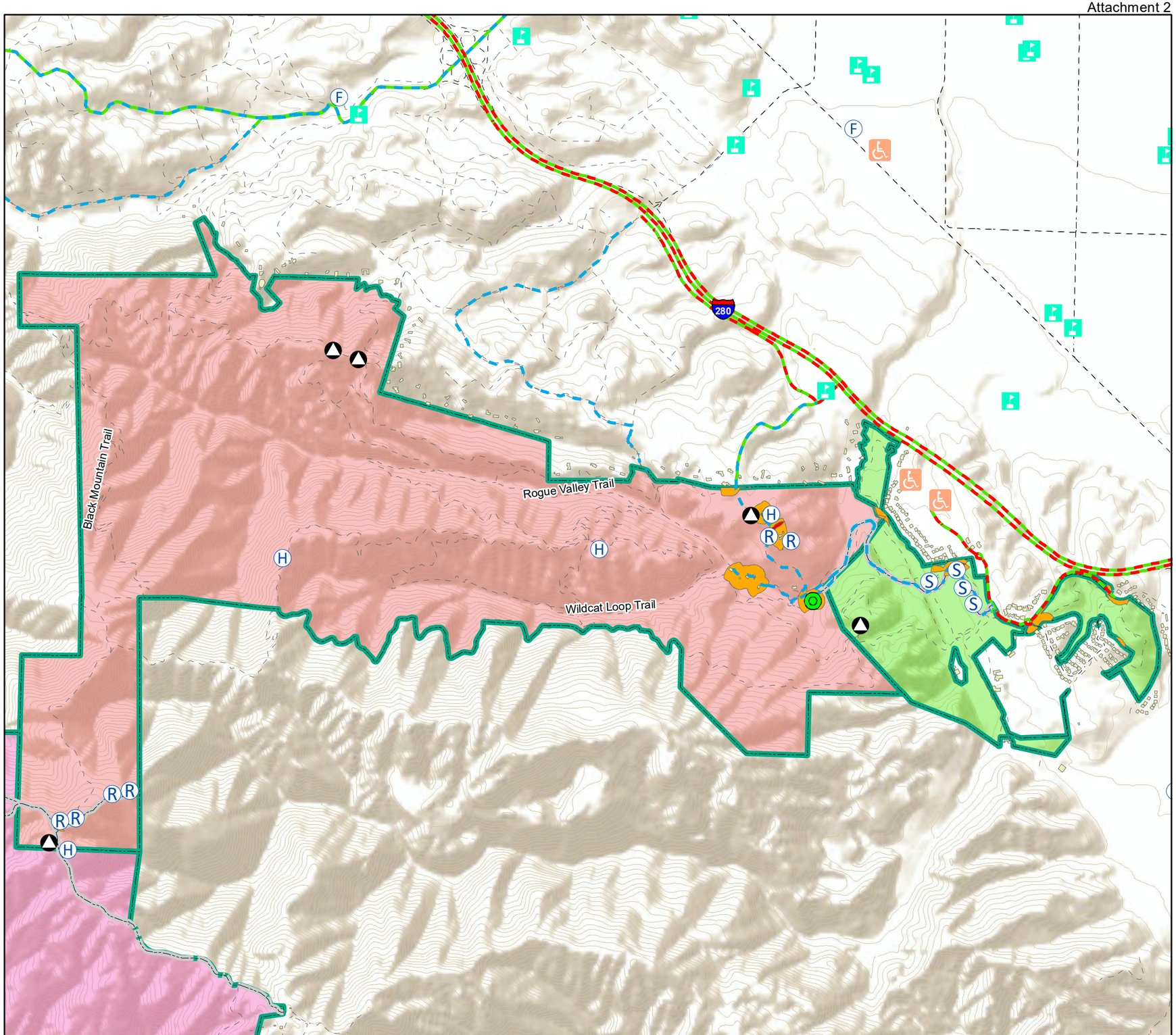
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Fire Station

Target Hazards
- Assisted Living Facility
- Community Center
- School/Day Care

Fire Management Logistics
- Helispot
- Lookout
- Staging Area

OSP & Managed Properties
- Boundary
- Monte Bello
- Rancho San Antonio
- Rancho San Antonio County Park



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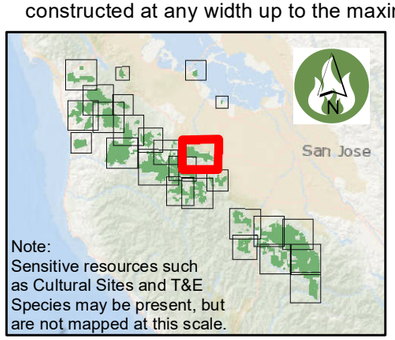


0 0.25 0.5 Miles

Treatment Priorities
Monte Bello

Treatment Priority Areas
- Tier 1
- Tier 2

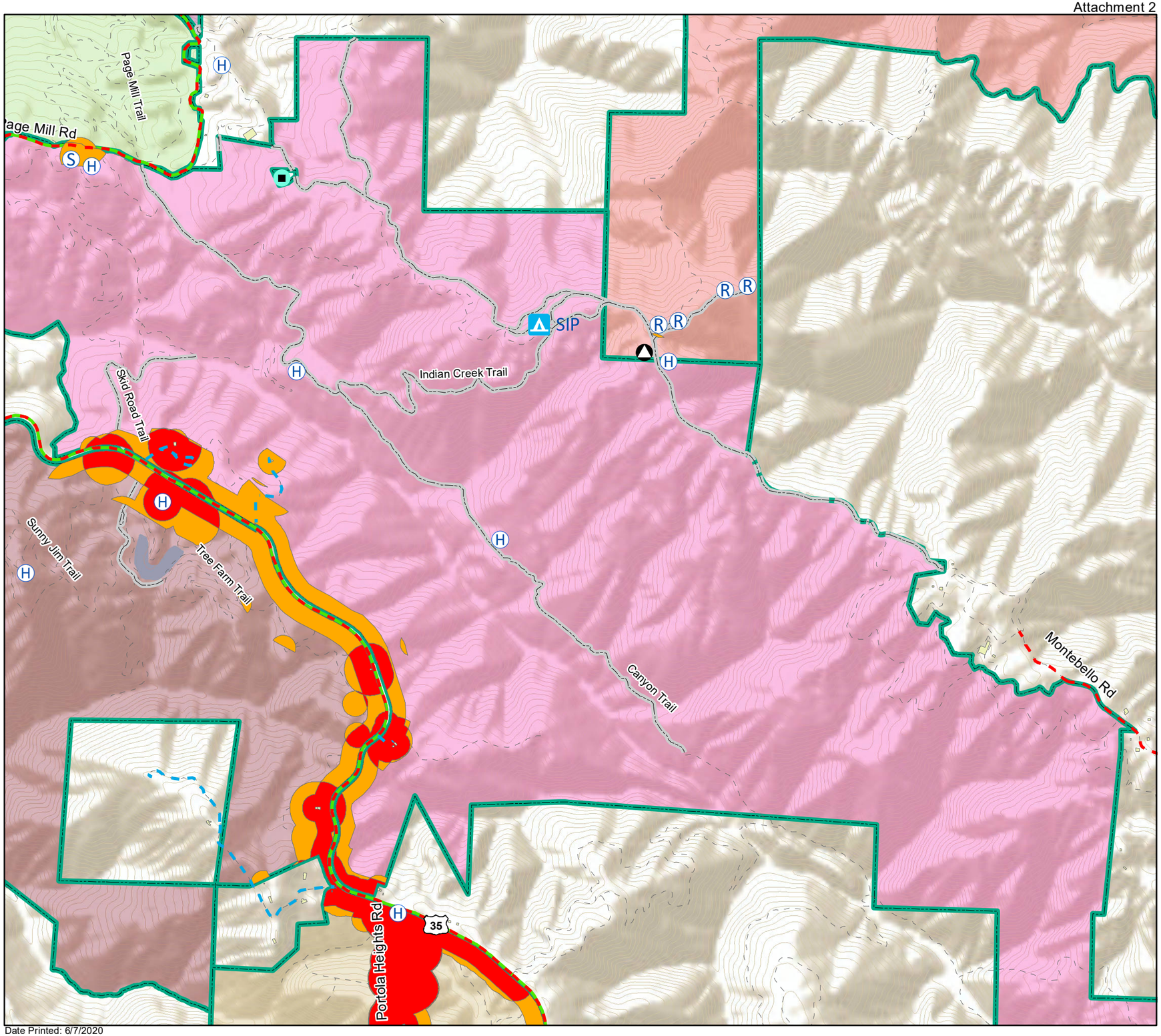
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Communication
- Shelter-in-Place
- Water Tank

Target Hazards
- Camp Site

Fire Management Logistics
- Helispot
- Lookout
- Staging Area

OSP & Managed Properties
- Boundary
- Foothills
- Long Ridge
- Los Trancos
- Monte Bello
- Rancho San Antonio
- Skyline Ridge



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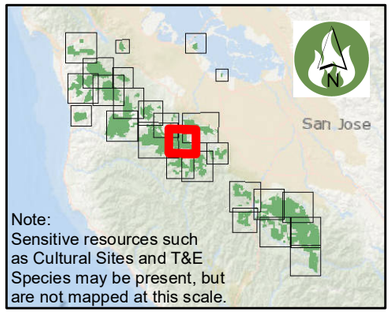


0 0.25 0.5 Miles

Treatment Priorities
Long Ridge

Treatment Priority Areas
- Tier 1
- Tier 2

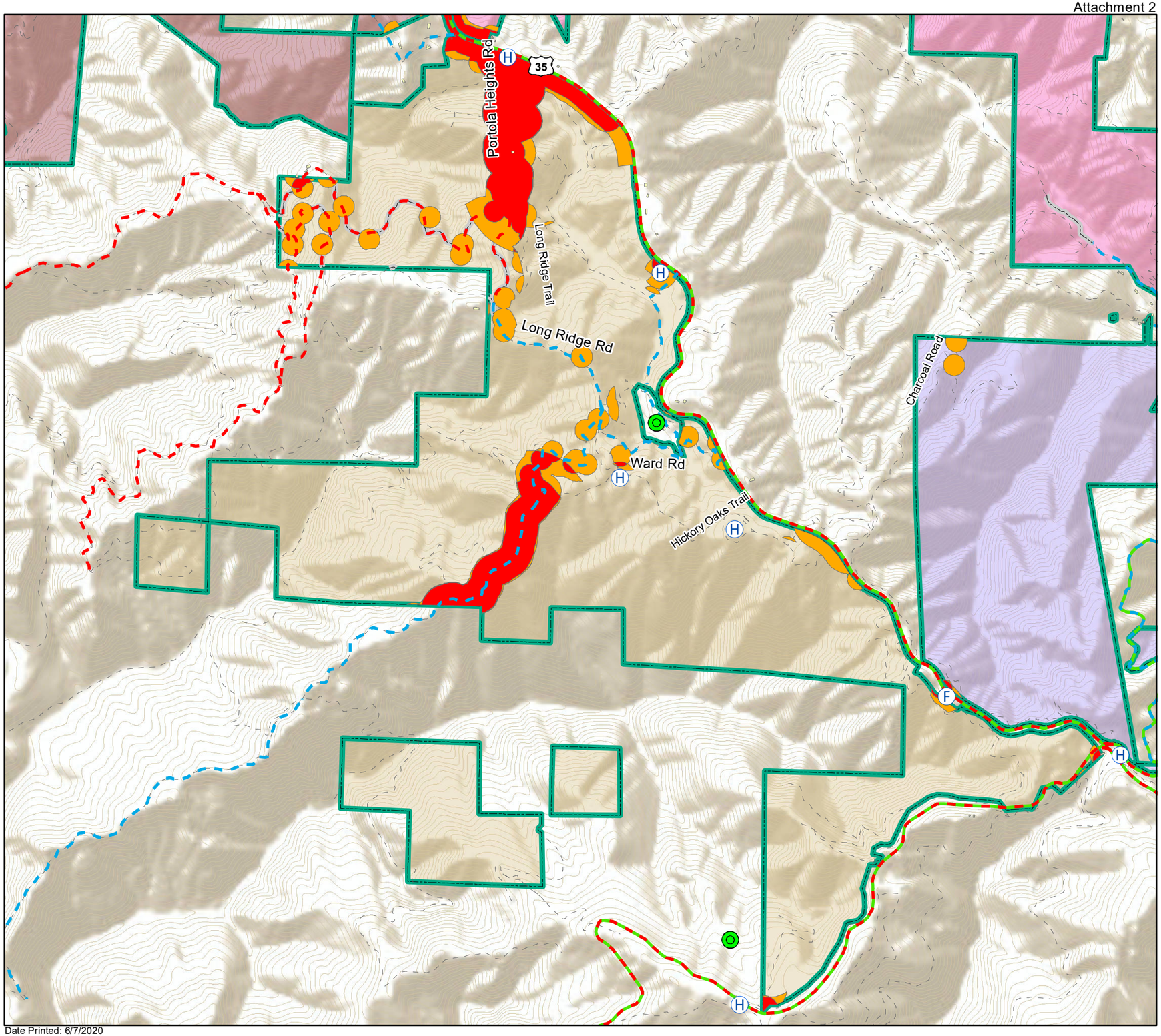
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- (F) Fire Station

Target Hazards
- Community Center

Fire Management Logistics
- (H) Helispot

OSP & Managed Properties
- Boundary
- Long Ridge
- Monte Bello
- Saratoga Gap
- Skyline Ridge



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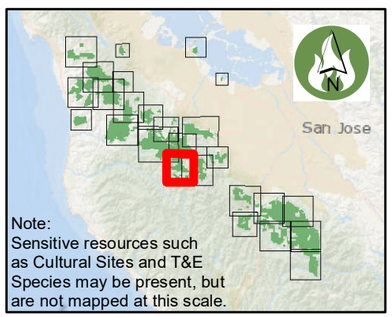


0 0.25 0.5 Miles

Treatment Priorities
Saratoga Gap/Monte Bello/Long Ridge

Treatment Priority Areas
- Tier 1
- Tier 2

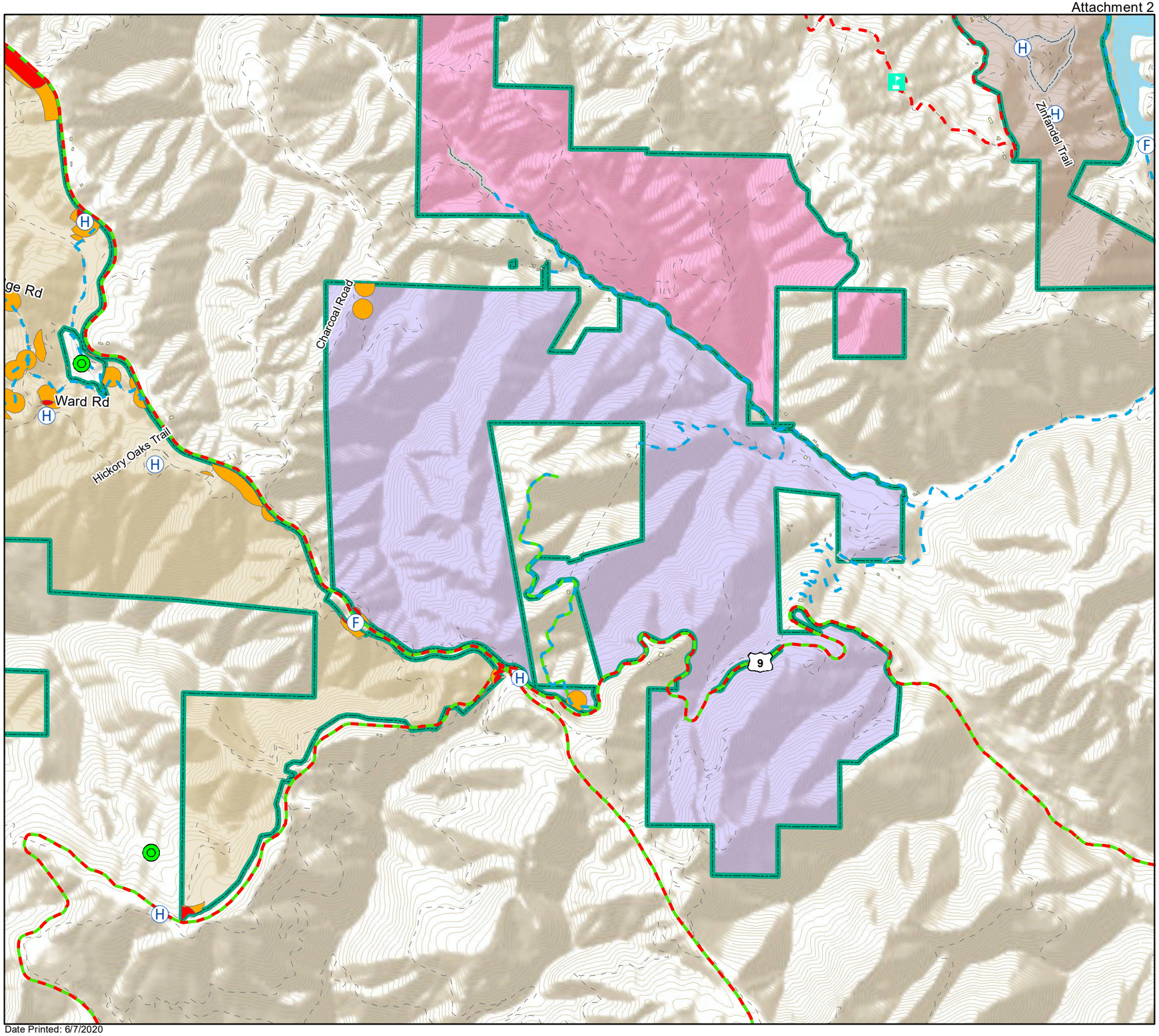
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station

Target Hazards
- Community Center
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Long Ridge
- Monte Bello
- Picchetti Ranch
- Saratoga Gap



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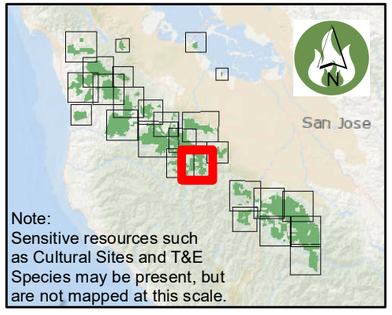

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Date Printed: 6/7/2020

Treatment Priorities
Fremont Older/Picchetti Ranch

Treatment Priority Areas
- Tier 2

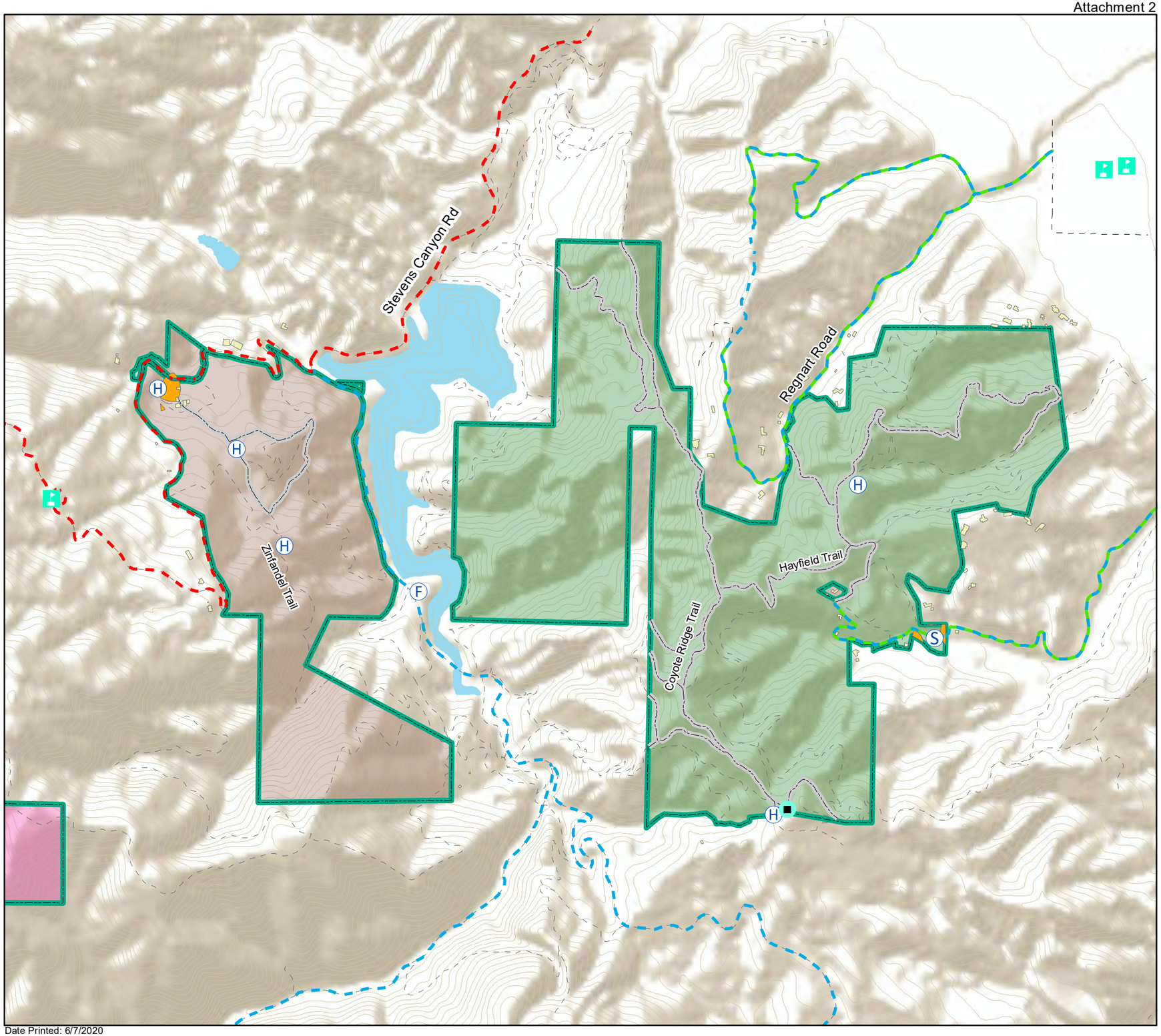
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot
- Staging

OSP & Managed Properties
- Boundary
- Fremont Older
- Monte Bello
- Picchetti Ranch



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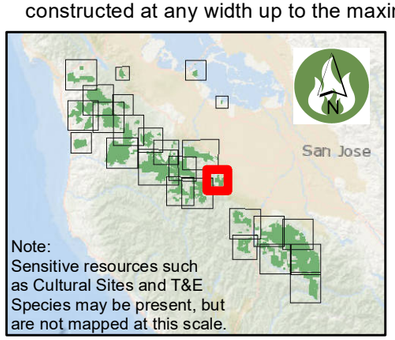


0 0.25 0.5 Miles

Treatment Priorities
El Sereno/Felton Station/St. Joseph's Hill

Treatment Priority Areas
- Tier 1
- Tier 2

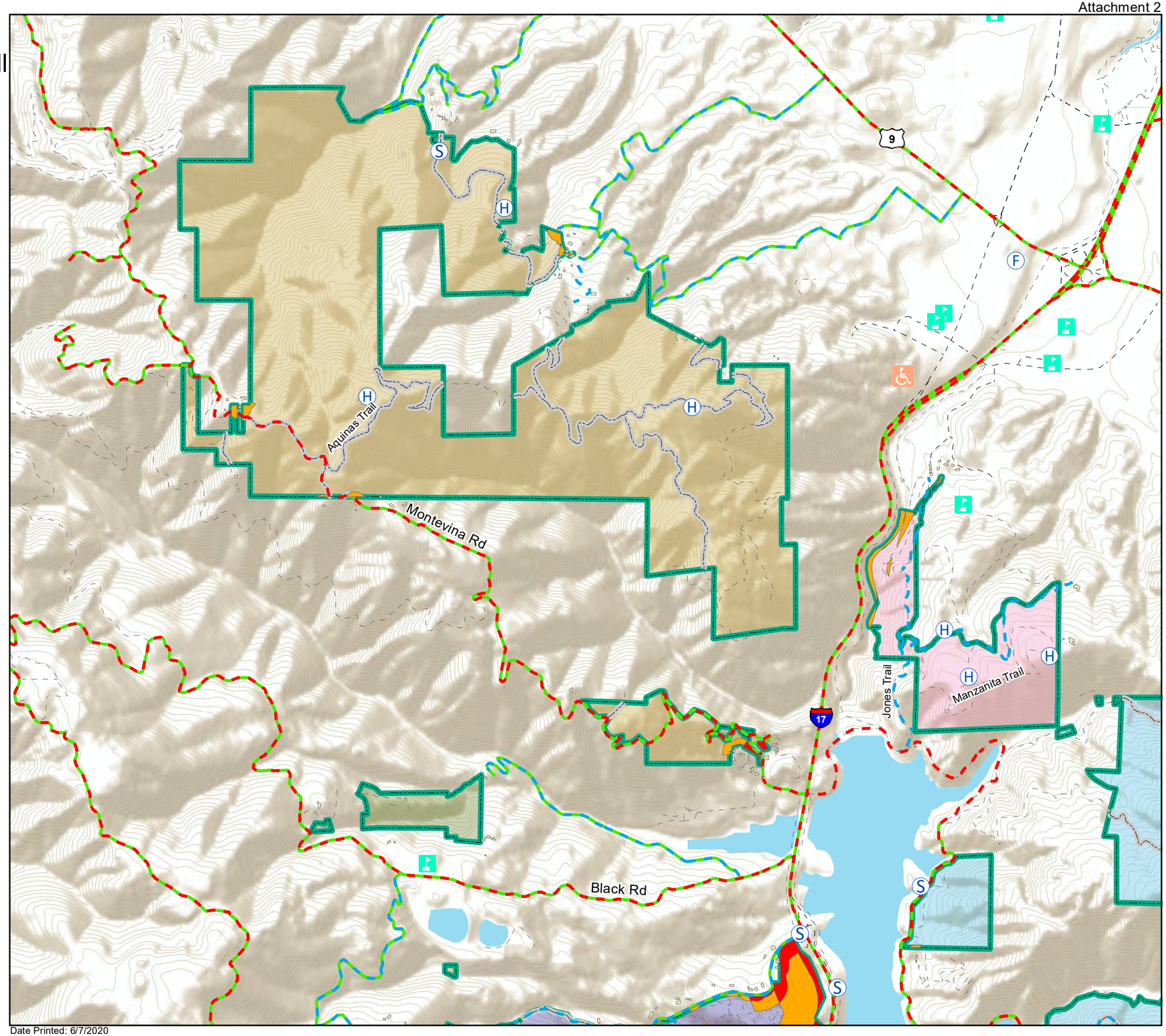
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- (F) Fire Station

Target Hazards
- Assisted Living Facility
- School/Day Care

Fire Management Logistics
- (H) Helispot
- (S) Staging Area

OSP & Managed Properties
- Boundary
- Bear Creek Redwoods
- El Sereno
- Felton Station
- Sierra Azul
- St. Joseph's Hill



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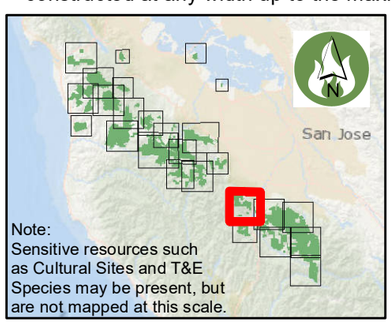


0 0.25 0.5 Miles

Treatment Priorities
Bear Creek Redwoods

Treatment Priority Areas
- Tier 1
- Tier 2

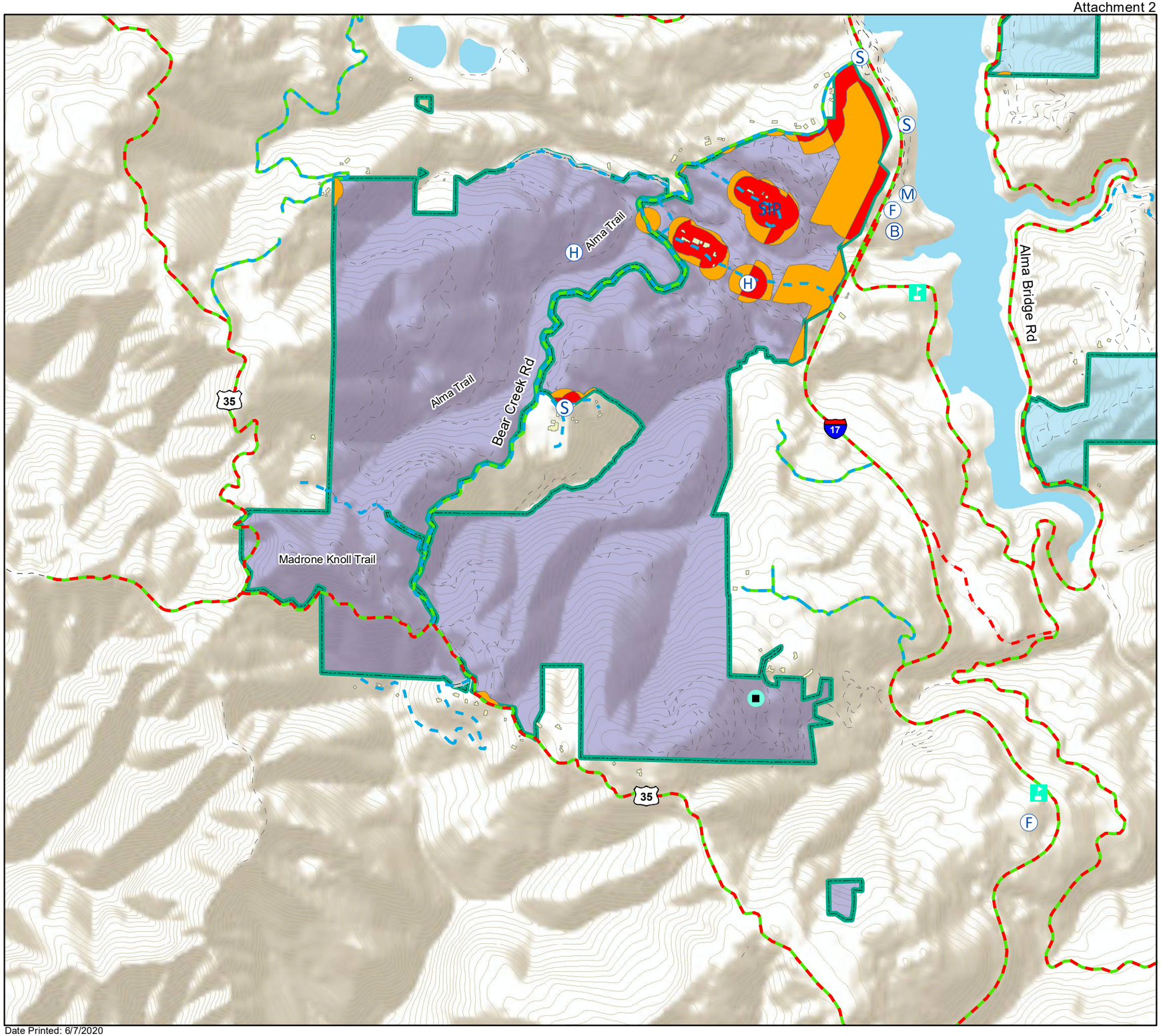
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- (F) Fire Station
- (B) Incident Command Post
- (M) Medivac Site
- SIP Shelter-in-Place
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- (H) Helispot
- (S) Staging Area

OSP & Managed Properties
- Boundary
- Bear Creek Redwoods
- El Sereno
- Sierra Azul



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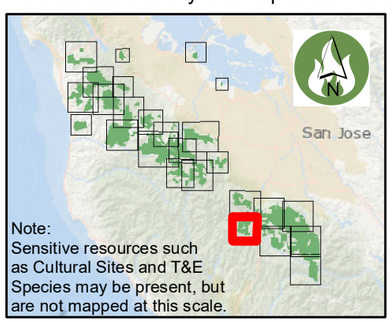

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Treatment Priorities
Sierra Azul (1 of 5)

Treatment Priority Areas
- Tier 1
- Tier 2

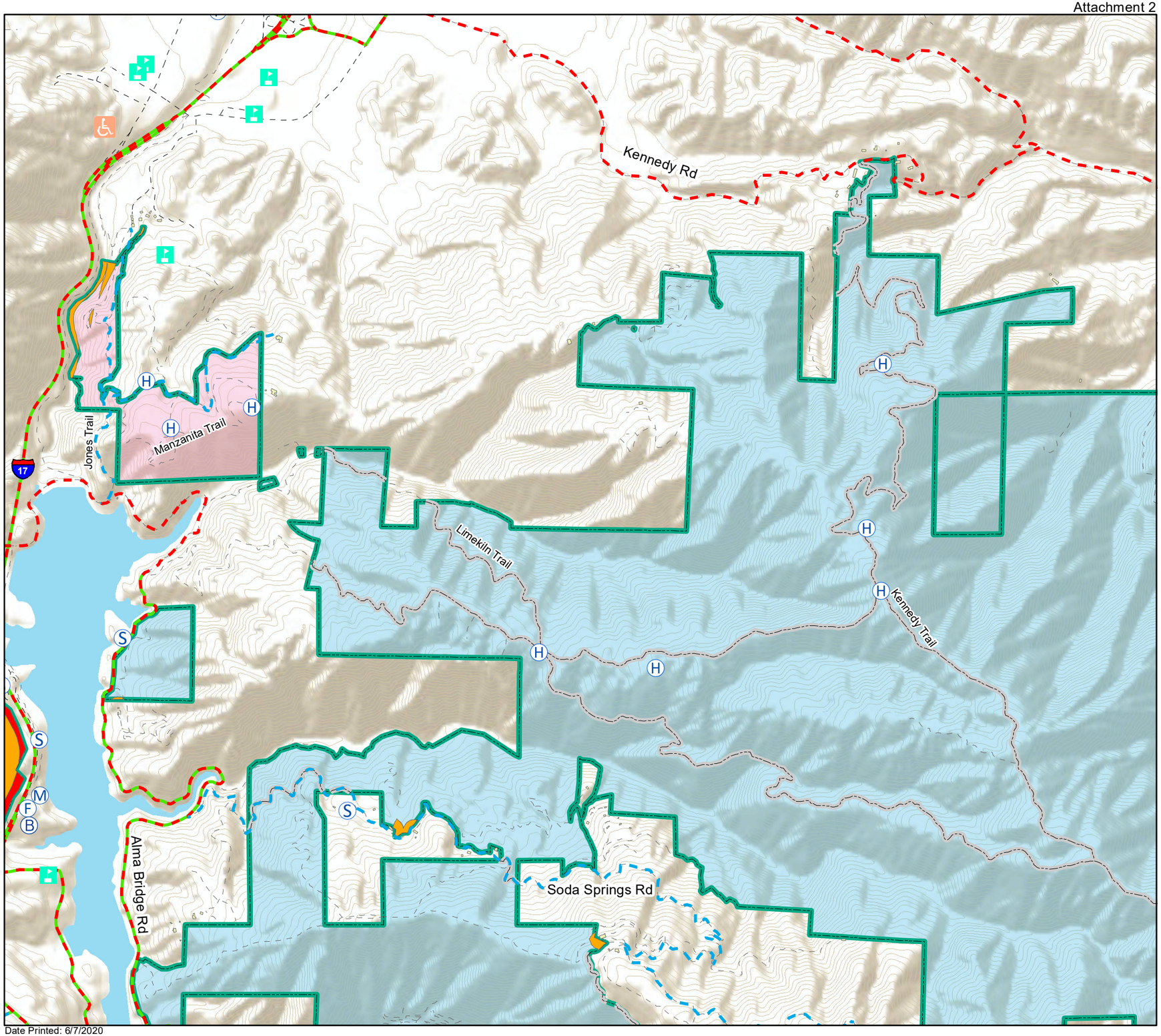
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station
- Incident Command Post
- Medivac Site

Target Hazards
- Assisted Living Facility
- School/Day Care

Fire Management Logistics
- Helispot
- Staging Area

OSP & Managed Properties
- Boundary
- Bear Creek Redwoods
- Sierra Azul
- St. Joseph's Hill



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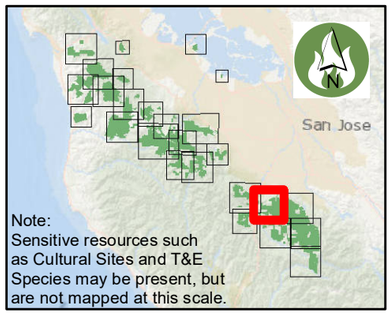


0 0.25 0.5 Miles

Treatment Priorities
Sierra Azul (2 of 5)

Treatment Priority Areas
- Tier 2

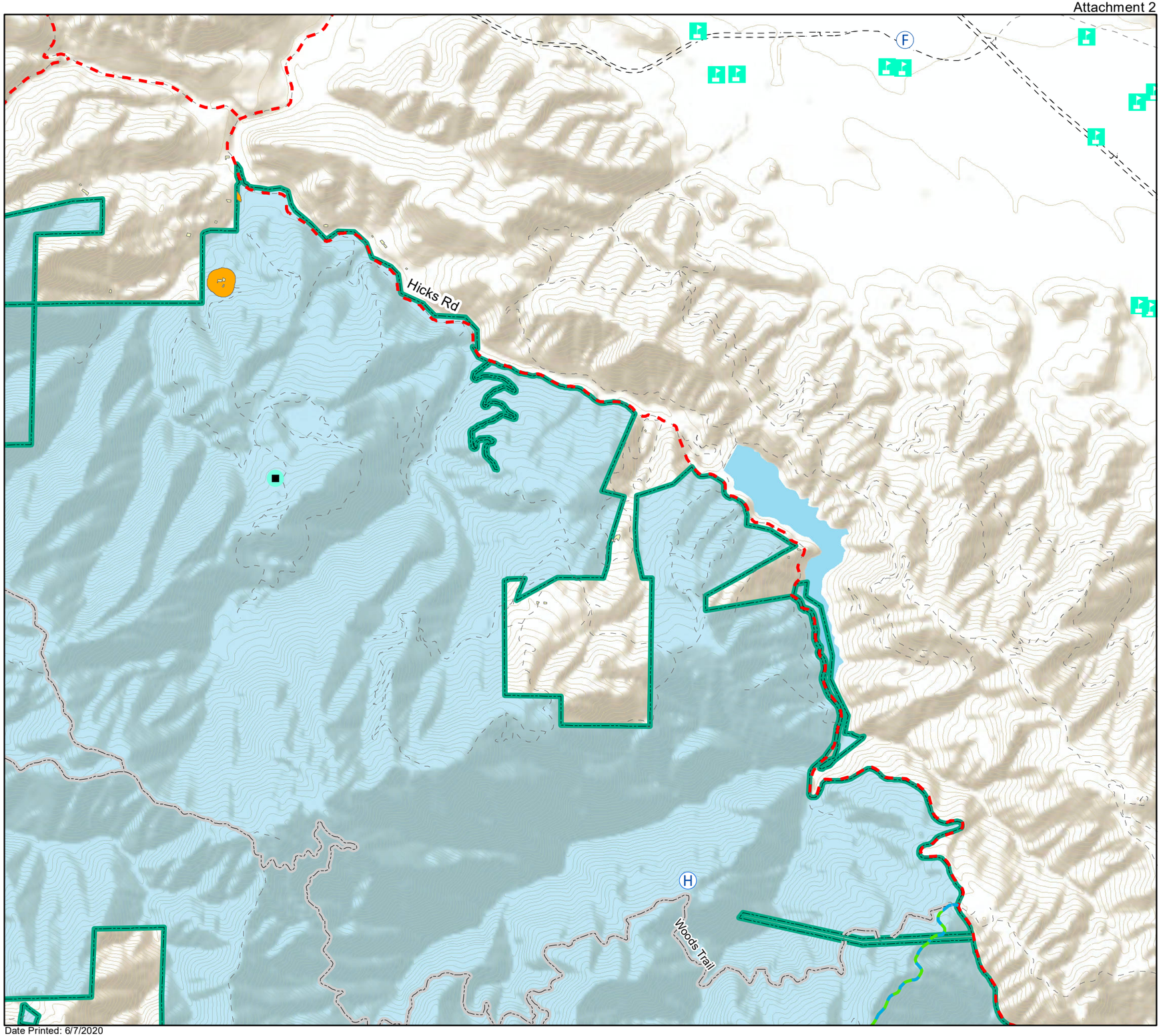
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Fire Station
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Sierra Azul



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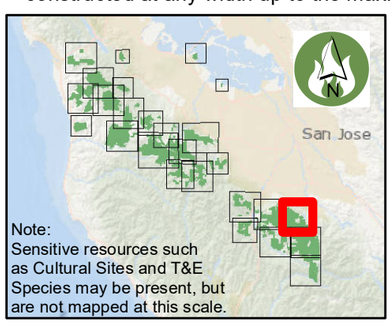

0 0.25 0.5 Miles

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Treatment Priorities
Sierra Azul (3 of 5)

Treatment Priority Areas
- Tier 1
- Tier 2

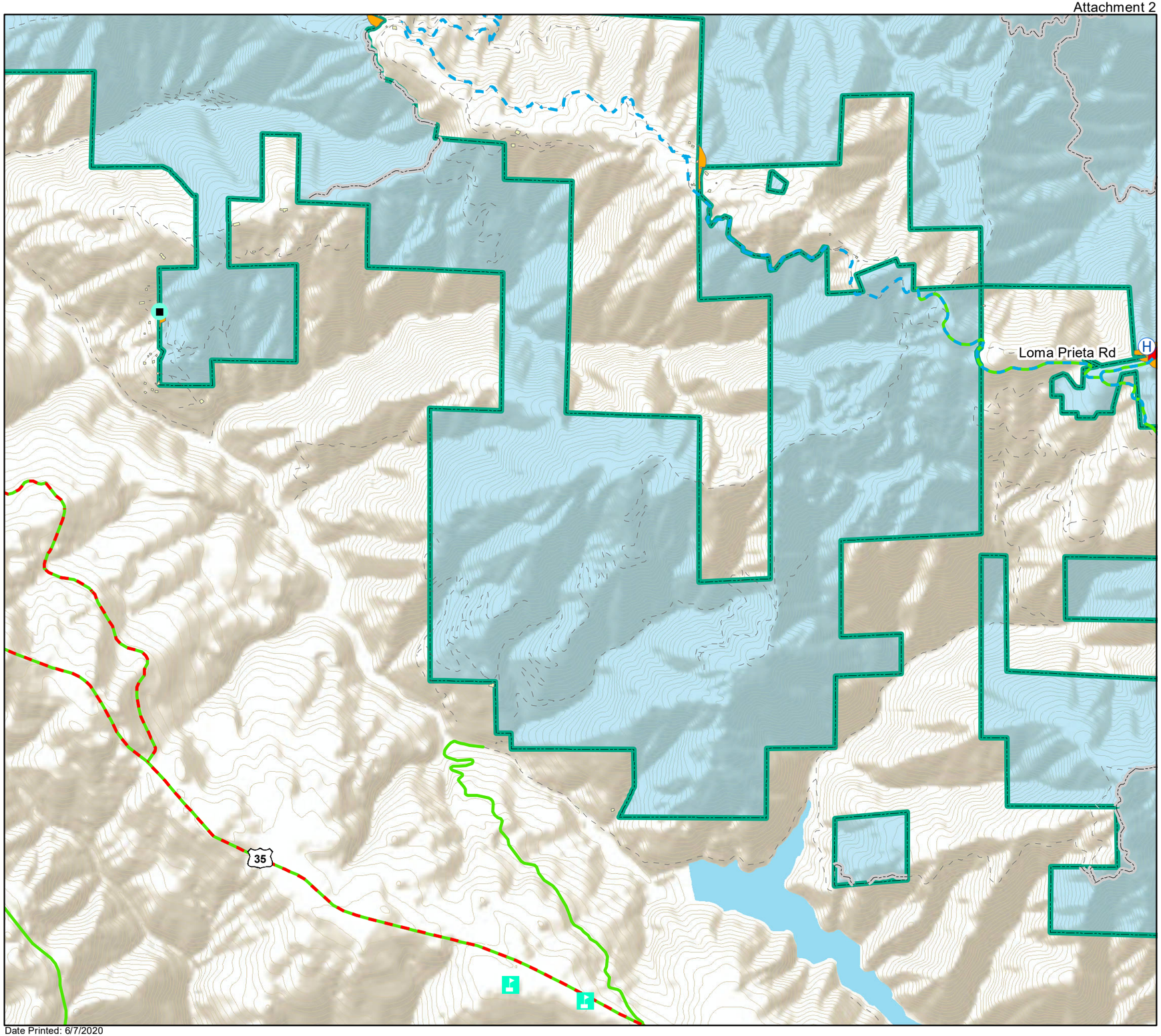
Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Water Tank

Target Hazards
- School/Day Care

Fire Management Logistics
- Helispot

OSP & Managed Properties
- Boundary
- Sierra Azul



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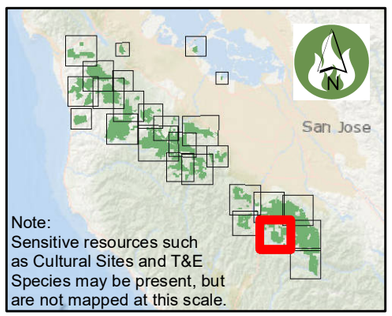


0 0.25 0.5 Miles

Treatment Priorities
Sierra Azul (4 of 5)

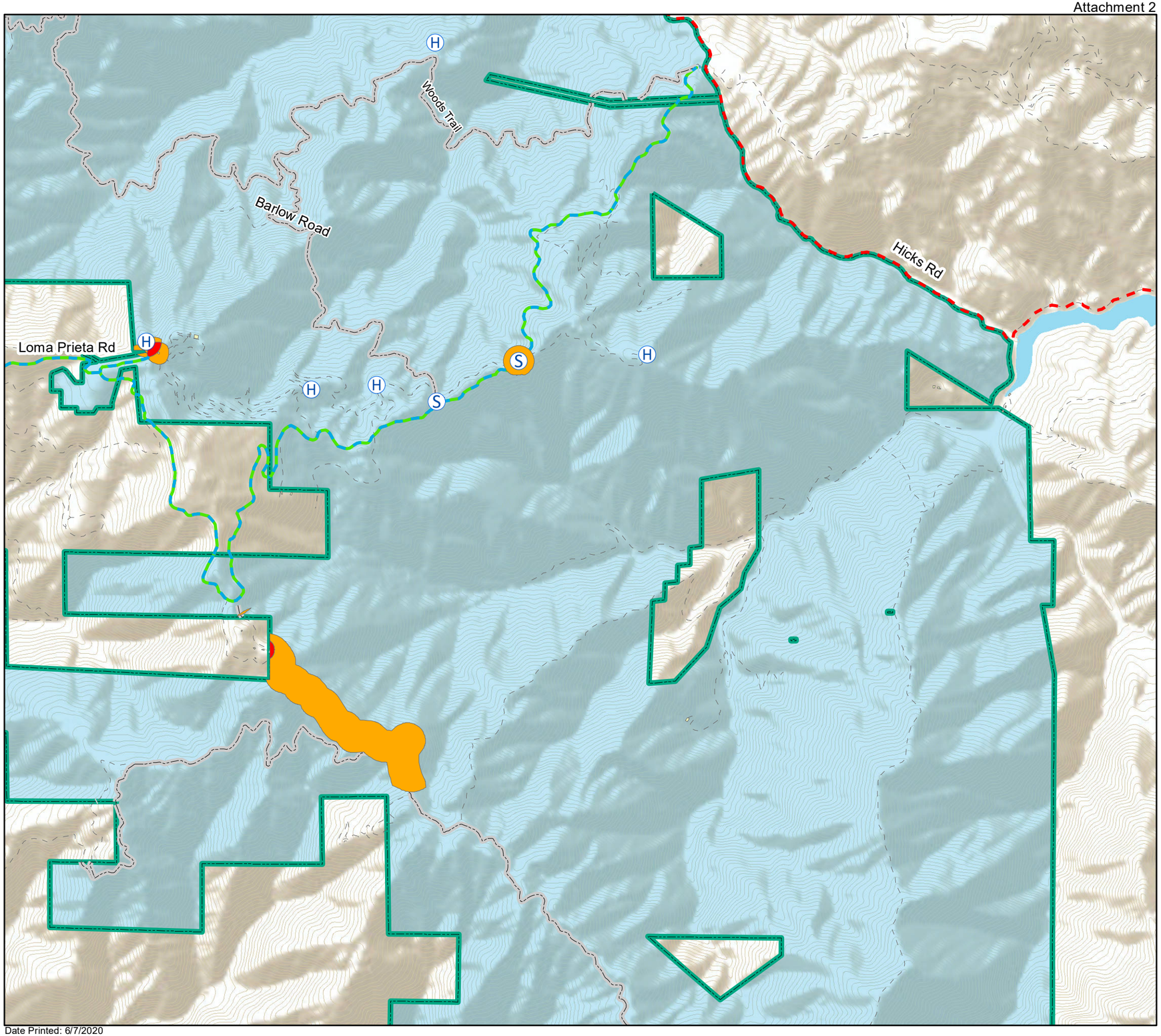
Treatment Priority Areas
- Tier 1
- Tier 2

Critical Infrastructure
- Primary Evacuation Route
- Secondary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class
- Wildland Type 3 Ingress/Egress
- Road or Trail

Fire Management Logistics
- Helispot
- Staging Area

OSP & Managed Properties
- Boundary
- Sierra Azul



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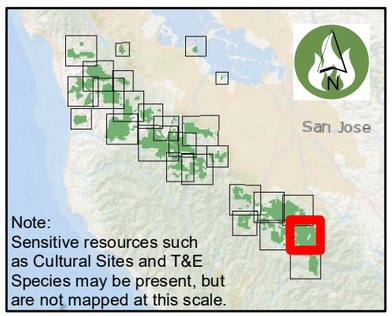


0 0.25 0.5 Miles

Treatment Priorities
Sierra Azul (5 of 5)

Critical Infrastructure

- Primary Evacuation Route
- Structure Type 1 (Tender)

Maintained for Vehicle Class

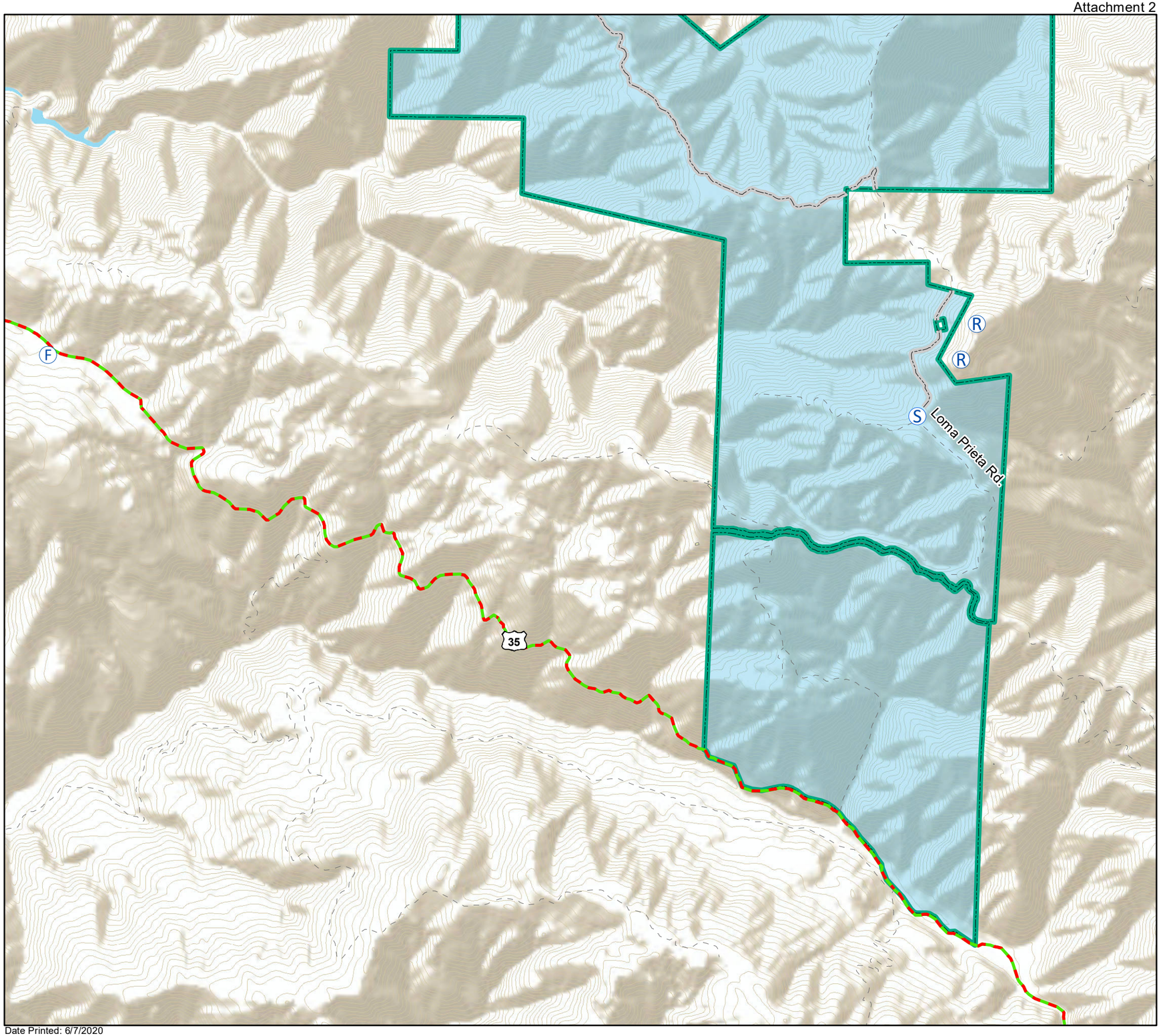
- Wildland Type 3 Ingress/Egress
- Road or Trail
- Ⓡ Communication
- Ⓕ Fire Station

Fire Management Logistics

- Ⓢ Staging Area

OSP & Managed Properties

- Boundary
- Sierra Azul



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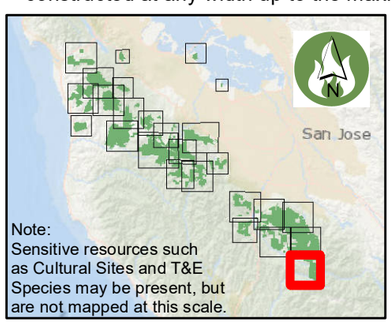

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Treatment Priorities
Ravenswood

Road or Trail

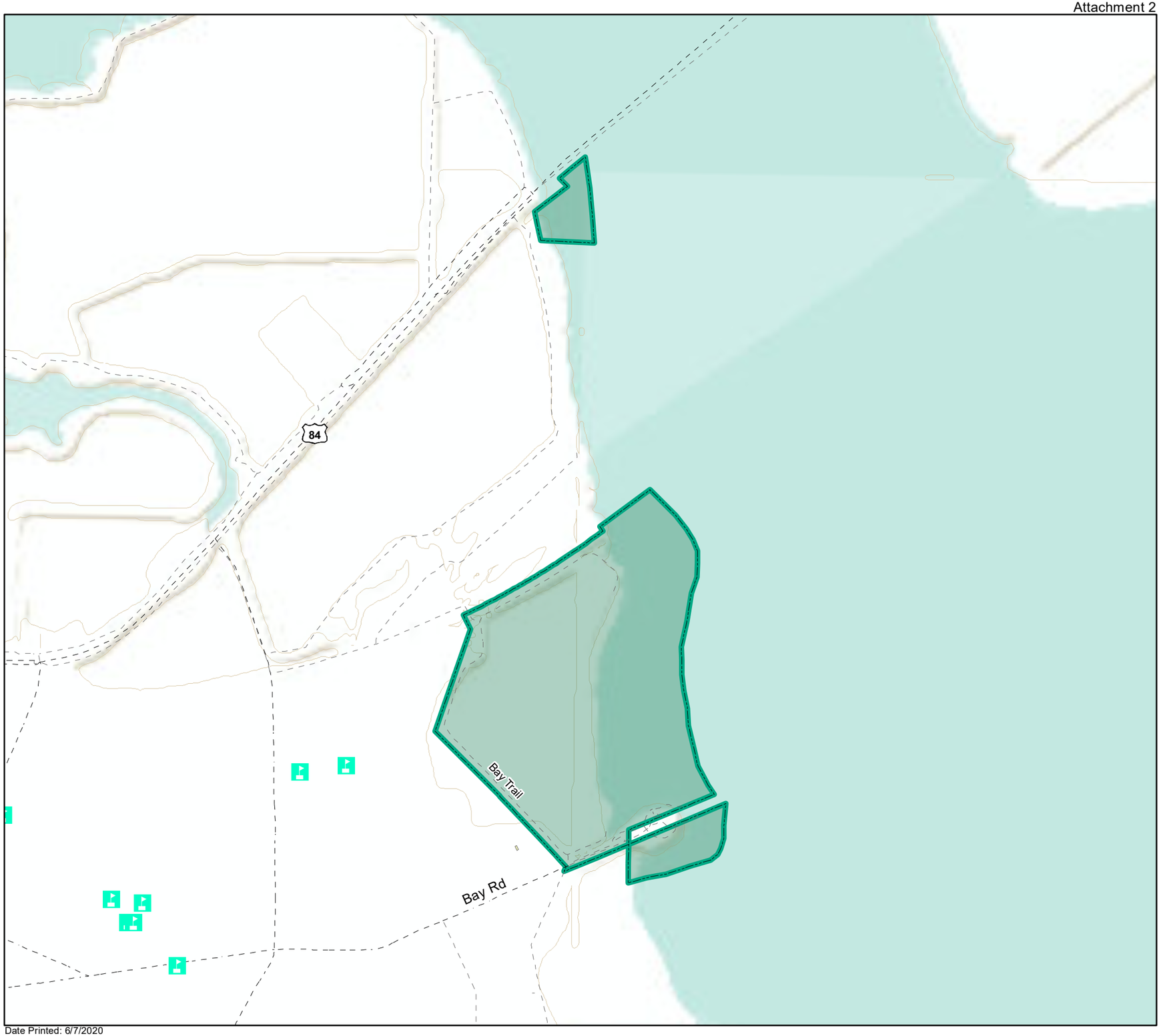
Target Hazards

School/Day Care

OSP & Managed Properties

Boundary

Ravenswood



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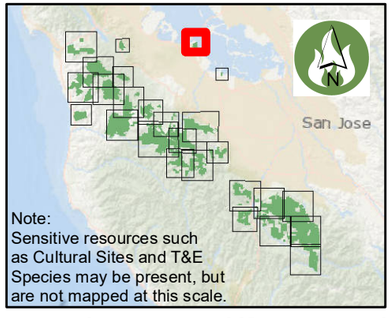

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Treatment Priorities
Stevens Creek Shoreline NSA

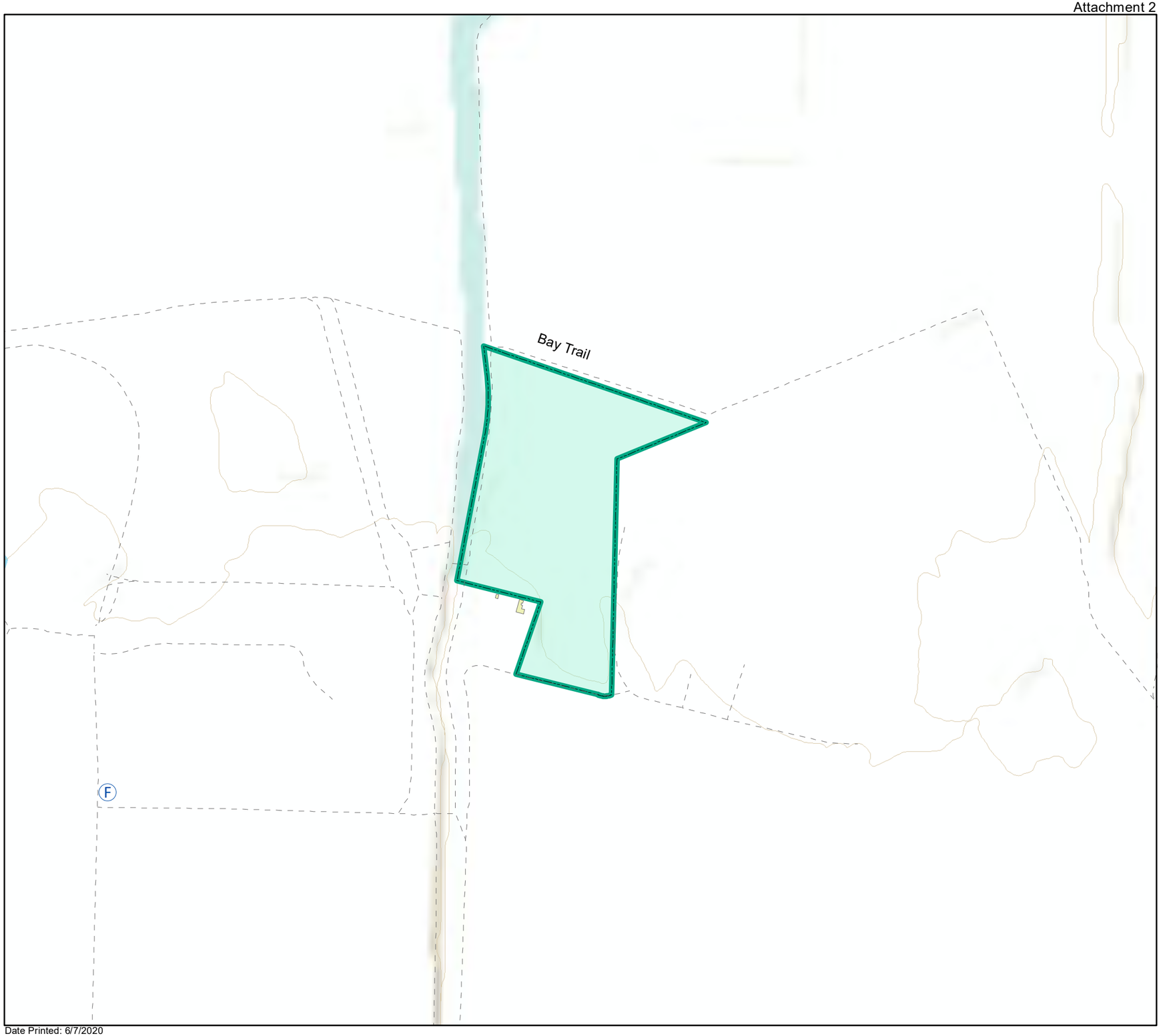
Road or Trail

Fire Station

OSP & Managed Properties

Boundary

Stevens Creek Shoreline Nature Study Area



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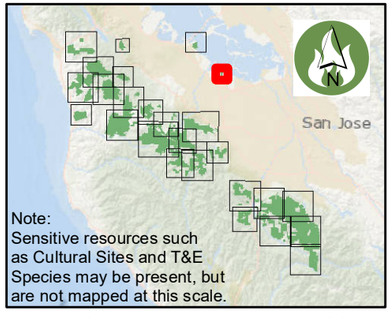

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APPENDIX 3.0-2 APPLICABLE BEST MANAGEMENT PRACTICES

Appendix 3.0-2a	IPMP BMPs
Appendix 3.0-2b	Maintenance Operations Manual
Appendix 3.0-2c	Safety Manual
Appendix 3.0-2d	Resource Management Policies
Appendix 3.0-2e	Regulations for Use of Midpeninsula Regional Open Space District Lands
Appendix 3.0-2f	CDFW-Approved SFDFW Protocol
Appendix 3.0-2g	Bat BMPs

Appendix 3.0-2a IPMP BMPs

District BMPs for IPM	
BMP ID#	**Best Management Practices**
1	All pesticide use shall be implemented consistent with written Pest Control Recommendations prepared annually by a licensed Pest Control Adviser. The Pest Control Adviser shall ensure that all pesticide applications are performed at the time of year and phenological window for maximum effectiveness, thereby increasing treatment efficacy and reducing the need for follow-up applications.
2	Adjuvants shall be used and applied consistent with the District's Pest Control Recommendations.
3	Applicators shall follow all pesticide label requirements and refer to all other BMPs regarding mandatory measures to protect sensitive resources and employee and public health during pesticide application. All District field crew who perform herbicide treatments shall have specialized experience and training in pesticide safety, IPM principles, and special status species.
4	Pesticide applicators shall have or work under the direction of a person with a Qualified Applicator License (QAL) or Qualified Applicator Certificate (QAC). As appropriate, the District shall implement QAC certification requirements for additional field staff to enhance field crew training. Contractors and grazing and agricultural tenants may apply approved pesticides after review and approval by the District and under the direction of QAL/QAC field supervisors. After review and approval by the District and under the direction of QAL/QAC, contractors may apply approved fungicides to District preserves for the research and control of Sudden Oak Death (SOD). As needed for the control of mosquitos, cattle grazing rangers may apply District-approved bacterial pathogens to water troughs in District preserves. Employees, contractors and tenants may install approved ant and roach bait stations inside buildings in tamper-proof containers without review by a QAL/QAC. Tenants may not use rodenticides; only qualified District staff or District contractors may use approved rodenticides and these should only be used in the event of an urgent human health issue, in a manner consistent with the product label, and in anchored, tamper-proof containers inside buildings.
5	All storage, loading and mixing of pesticides shall be set back at least 300 feet from any aquatic feature or special-status species or their habitat or sensitive natural communities. Applicators shall use an air gap or anti-siphon device to prevent backflow while loading. All mixing and transferring shall occur within a contained area. Any transfer or mixing on the ground shall be within containment pans or over protective tarps and away from drain inlets, culverts, wells, areas with porous or erosion-prone soil, or other features that may allow for runoff.
6	As deemed necessary by the Pest Control Adviser, QAL, or QAC, appropriate, non-toxic colorants or dyes shall be added to the herbicide mixture to determine treated areas and prevent over-spraying, particularly in public areas.
7	Application Requirements - The following general application parameters shall be employed during pesticide application: ◢ Application shall cease when weather parameters exceed label specifications, when wind at site of application exceeds 7 miles per hour (MPH), or when precipitation (rain) occurs or is forecasted with greater than a 40 percent probability in the next 24-hour period to prevent loss of efficacy and lessen the potential for pesticides to enter surface water; ◢ All restrictions and limitations, including those on irrigation, cultivation, re-entry, etc., as described on the pesticide product label shall be followed for sites treated with pesticides; ◢ Spray nozzles shall be configured to produce a relatively large droplet size; ◢ Low nozzle pressures (30-70 pounds per square inch [PSI]) shall be observed; ◢ Spray nozzles shall be kept within 24 inches of vegetation during spraying; ◢ Application equipment shall be calibrated periodically per manufacturer specifications or frequently enough such that equipment is applying pesticides according to label directions; ◢ Drift and overspray avoidance measures shall be used to prevent drift in all locations. Particular attention shall be paid to areas where target weeds and pests are in proximity to special-status species or their habitat. Such measures can consist of, but would not be limited to the use of plastic shields around target weeds and pests and selecting and using appropriate spray nozzles and pressures. Spray areas may also be limited by using application methods such as spot treatments and thin line treatments of one-inch wide or less. ◢ Due to the potential presence of temperature inversion layers, no spraying shall be conducted on designated "Spare the Air" days.
8	Notification of Pesticide Application – Signs shall be posted notifying the public, employees, and contractors of the District's use of pesticides. The signs shall consist of the following information: product name, signal word, and manufacturer, active ingredient, and EPA registration number; target pest; preserve name; treatment location in preserve; date and time of application; date which notification sign may be removed; and contact person with telephone number. Signs shall generally be posted 24 hours before the start of treatment and

District BMPs for IPM	
BMP ID#	**Best Management Practices**
	notification shall remain in place for 72 hours after treatment ceases. In no event shall a sign be in place longer than 14 days without dates being updated. See the IPM Guidance Manual for details on posting locations, posting for pesticide use in buildings and for exceptions.
9	Disposal of Pesticide Containers – Cleanup of all pesticide and adjuvant containers shall follow the product label and local waste disposal regulations. This generally consists of triple rinsing with clean water at an approved site and adding the rinsate to the batch tank for application. Used containers shall be punctured on the top and bottom to render them unusable, unless said containers are part of a manufacturer's container recycling program, in which case the manufacturer's instructions shall be followed. Disposal of non-recyclable containers shall be at legal dumpsites. Equipment shall not be cleaned and personnel shall not bathe in a manner that allows contaminated water to directly enter any body of water within the treatment areas or adjacent watersheds.
10	All appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and local jurisdictions shall be followed. All applications shall adhere to label directions for application rates and methods, storage, transportation, mixing, and container disposal. All contracted applicators shall be appropriately licensed by the state. District staff shall coordinate with the County Agricultural Commissioners, and all required licenses and permits shall be obtained prior to pesticide application.
11	Sanitation and Prevention of Contamination - All personnel working in infested areas shall take appropriate precautions to not carry or spread weed seed or SOD-associated spores outside of the infested area. Such precautions will consist of, as necessary based on site conditions, cleaning of soil and plant materials from tools, equipment, shoes, clothing, or vehicles prior to entering or leaving the site.
12	All staff, contractors, and volunteers shall be properly trained to prevent spreading weeds and pests to other sites.
13	District staff shall appropriately maintain facilities where tools, equipment, and vehicles are stored free from invasive plants.
14	District staff shall ensure that rental equipment and project materials (especially soil, rock, erosion control material and seed) are free of invasive plant material prior to their use at a worksite.
15	Suitable onsite disposal areas shall be identified to prevent the spread of weed seeds.
16	Invasive plant material shall be rendered nonviable when being retained onsite. Staff shall desiccate or decompose plant material until it is nonviable (partially decomposed, very slimy, or brittle). Depending on the type of plant, disposed plant material can be left out in the open as long as roots are not in contact with moist soil, or can be covered with a tarp to prevent material from blowing or washing away.
17	District staff shall monitor all sites where invasive plant material is disposed on-site and treat any newly emerged invasive plants.
18	When transporting invasive plant material off-site for disposal, the plant material shall be contained in enclosed bins, heavy-duty bags, or a securely covered truck bed. All vehicles used to transport invasive plant material shall be cleaned after each use.
19	Aquatic Areas – Shortly before treatment, a District-approved qualified biologist or other District-approved personnel shall survey the treatment site to determine whether any aquatic features are located onsite. In addition, on a repeating basis, grassland treatment sites shall be surveyed once every five years and brushy and wooded sites shall be surveyed by a District-approved biologist once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Aquatic features are defined as any natural or manmade lake, pond, river, creek, drainage way, ditch, spring, saturated soils, or similar feature that holds water at the time of treatment or typically becomes inundated during winter rains. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. If during the survey it is found that aquatic features are present within 15 feet of the proposed treatment area, the District shall either eliminate all treatment activities within 15 feet of the aquatic feature from the project (i.e. do not implement treatment actions in those areas) or if the District chooses to continue treatment actions in these areas, it shall use pesticides and adjuvants labeled for aquatic use and follow the requirements of the mitigation measure for special-status wildlife species and the CDFW Streambed Alteration Agreement.
20	Application of pesticides shall be conducted in accordance with the California Red-Legged Frog Injunction (Center For Biological Diversity v. U.S. Environmental Protection Agency (2006) Case No.: 02-1580-JSW) in known or potential California red-legged frog habitat specifically by: not applying specified pesticides within 15 feet of aquatic features (including areas that are wet at time of spraying or areas that are dry at time of spraying but subsequently might be wet during the next winter season); utilizing only spot-spraying techniques and equipment by a certified applicator or person working under the direct supervision of a certified applicator; and

District BMPs for IPM	
BMP ID#	**Best Management Practices**
	not spraying during precipitation or if precipitation is forecast to occur within 24 hours before or after the proposed application. Preserves in which these precautions must be undertaken are: Miramontes Ridge, Purisima Creek Redwoods, El Corte de Madera, La Honda Creek, Picchetti Ranch, Russian Ridge, Sierra Azul, Tunitas Creek, Skyline Ridge, Rancho San Antonio, Monte Bello and Coal Creek OSPs and Toto Ranch.
21	A District-approved biologist shall survey all selected treatment sites shortly before work to determine site conditions and develop any necessary site-specific measures. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. In addition, o a repeating basis, grassland treatment sites shall be surveyed by a District-approved biologist once every five years and brushy and wooded sites shall be surveyed once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Site inspections shall evaluate existing conditions at a given treatment site including the presence, population size, growth stage, and percent cover of target weeds and pests relative to native plant cover and the presence of special-status species and their habitat, or sensitive natural communities. In addition, annual worker environmental awareness training shall be conducted for all treatment field crews and contractors for special-status species and sensitive natural communities determined to have the potential to occur on the treatment site by a District approved biologist. The education training shall be conducted prior to starting work at the treatment site and upon the arrival of any new worker onto sites with the potential for special-status species or sensitive natural communities. The training shall consist of a brief review of life history, field identification, and habitat requirements for each special-status species, their known or probable locations in the vicinity of the treatment site, potential fines for violations, avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered.
22	Nesting Birds - For all IPM activities that could result in potential noise and other land disturbances that could affect nesting birds (e.g., tree removal, mowing during nesting season, mastication, brush removal on rangelands), treatment sites shall be surveyed within two weeks prior to initiating activity to evaluate the potential for nesting birds. Tree removal will be limited, whenever feasible, based on the presence or absence of nesting birds. For all other treatments, if birds exhibiting nesting behavior are found within the treatment sites during the bird nesting season: March 15 – August 30 for smaller bird species such as passerines and February 15 - August 30 for raptors, impacts on nesting birds will be avoided by the establishment of appropriate buffers around active nests. The distance of the protective buffers surrounding each active nest site are: 1,000 feet for large raptors such as buteos, 500 feet for small raptors such as accipiters, and 250 feet for passerines. The size of the buffer may be adjusted by a District biologist in consultation with CDFW and USFWS depending on site specific conditions. Monitoring of the nest by a District biologist during and after treatment activities will be required if the activity has potential to adversely affect the nest. These areas can be subsequently treated after a District biologist or designated biological monitor confirms that the young have fully fledged, are no longer being fed by the parents and have left the nest site. For IPM activities that clearly would not have adverse impacts to nesting birds (e.g. treatments in buildings and spot spraying with herbicides), no survey for nesting birds would be required.
23	San Francisco dusky-footed woodrat and Santa Cruz kangaroo rat – All District staff, volunteers or contractors who will implement treatment actions shall receive training from a qualified biologist on the identification of dusky-footed woodrat, Santa Cruz kangaroo rat, and their nests or burrows. Generally, all San Francisco dusky-footed woodrat and their nests, and Santa Cruz kangaroo rat and their burrows will be avoided and left undisturbed by proposed work activities. If a nest site or burrow will be affected, the District will consult with CDFW. Rodenticides, snap traps, and glue boards shall not be used in buildings within 100 feet of active San Francisco dusky-footed woodrat nests or Santa Cruz kangaroo rat burrows; instead rodent control in these areas will be limited to non-lethal exclusion and relocation activities including relocation of nests if approved by CDFW. Tenants will contact the District for assistance in managing rat populations in buildings and under no circumstances will be allowed to use rodenticides.
24	Where appropriate, equipment modifications, mowing patterns, and buffer strips shall be incorporated into manual treatment methods to avoid disturbance of grassland wildlife.
25	Rare Plants – Shortly before treatment, all selected treatment sites shall be surveyed by District-approved personnel with environmental awareness training (BMP #20) prior to work to determine the potential presence of special-status plants. Rare plant surveys shall also be conducted during the appropriate season to assess the occurrence, if any, of dormant or overwintering plant species that may not be visible during the pre-treatment survey. If special-status plants are reported, information such as species and location shall be uploaded into an electronic inventory system and a biomonitor shall be present to oversee the planned IPM treatment. On a

District BMPs for IPM	
BMP ID#	**Best Management Practices**
	repeating basis, grassland treatment sites shall be surveyed by a District-approved biologist once every five years and brushy and wooded sites shall be surveyed once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. A 30-foot buffer shall be established from special-status plants. No application of herbicides shall be allowed within this buffer. Non-herbicide methods can be used within 30 feet of rare plants but they shall be designed to avoid damage to the rare plants (e.g., pulling).
26	Cultural Resources – District staff, volunteer crew leaders, and contractors implementing treatment activities shall receive training on the protection of sensitive archaeological, paleontological, or historic resources (e.g., projectile points, bowls, baskets, historic bottles, cans, trash deposits, or structures). In the event volunteers would be working in locations with potential cultural resources, staff shall provide instruction to protect and report any previously undiscovered cultural artifacts that might be uncovered during hand-digging activities. If archaeological or paleontological resources are encountered on a treatment site and the treatment method consists of physical disturbance of land surfaces (e.g., mowing, brush cutting, pulling, or digging), work shall avoid these areas or shall not commence until the significance of the find can be evaluated by a qualified archeologist. This measure is consistent with federal guidelines 36 CFR 800.13(a), which protects such resources in the event of unanticipated discovery.
27	Post-Treatment Monitoring – District staff shall monitor IPM activities within two months after herbicide treatment (except for routine minor maintenance activities which can be evaluated immediately after treatment) to determine if the target pest or weeds were effectively controlled with minimum impact to the environment and non-target organisms. Future treatment methods in the same season or future years shall be designed to respond to changes in site conditions.
28	Erosion Control and Revegetation - For sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment, erosion control measures shall be implemented before or after treatment as appropriate. These measures could consist of the application of forest duff or mulches, straw bales, straw wattles, other erosion control material, seeding, or planting of appropriate native plant species to control erosion, restore natural areas, and prevent the spread or reestablishment of weeds. Prior to the start of the winter storm season, these sites shall be inspected to confirm that erosion control techniques are still effective. When possible, applicators may select vegetation control techniques to maintain sufficient vegetative cover to mitigate erosion.
29	Operation of noise-generating equipment (e.g., chainsaws, wood chippers, brush-cutters, pick-up trucks) shall abide by the time-of-day restrictions established by the applicable local jurisdiction (i.e., City and/or County) if such noise activities would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship) located in the applicable local jurisdiction. If the local, applicable jurisdiction does not have a noise ordinance or policy restricting the time-of-day when noise-generating activity can occur, then the noise-generating activity shall be limited to two hours after sunrise and two hours before sunset, generally Monday through Friday. Additionally, if noise-generating activity would take place on a site that spans over multiple jurisdictions, then the most stringent noise restriction, as described in this BMP or in a local noise regulation, would apply. For IPM sites where the marbled murrelet has the potential to nest, as identified in the District's 2014 maps (see attachment) if noise-generating activities would occur during its breeding season (March 24 to September 15), the IPM activities would be subject to the noise requirements listed in the most current in the CDFW RMA issued to the District (see attachment).
30	All motorized equipment shall be shut down when not in use. Equipment and off-highway vehicle idling will be limited to 5 minutes.
31	Grazing Animals – Some herbicides, such as Milestone, Transline, and Capstone contain label language restricting grazing and/or use of compost. Always read and follow label directions.
32	Surface and Groundwater Protection – Applicators shall use BMPs regarding the prevention of drift, runoff, erosion, and water quality impairment. All work shall be in compliance with the 3 CCR § 6800 (Groundwater Protection). When possible, plant covers such as landscaping shall be established on bare soil and hillsides to minimize pesticide and sediment runoff. Pesticides without an aquatic label shall not be applied to: 1) permeable soils, soils prone to or with evidence of erosion without containment strategies (e.g., vegetative buffers, sediment barriers); or 2) in areas where aquatic habitats are located within 15 feet of the application site. In no cases should pesticides be applied to surface water bodies unless appropriate permits are obtained.

District BMPs for IPM	
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33	Application of glyphosate and cholecalciferol shall be conducted in accordance with the Goby -11 Injunction (Center for Biological Diversity v. EPA, Case No. 07-2794-JCS (N.D. Cal.), May 30, 2007) in applicable and relevant habitats for those species named in the Injunction that occur within the District. Applicable habitats for each species named in the Injunction are defined in the 2010 court order for the Center for Biological Diversity v. EPA. Because the interim protective measures (i.e., no-use buffer zones adjacent to certain features within certain geographic areas) established in the 2010 order vary depending on the species at issue and the pesticide being used, the USEPA webpage should be consulted: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay. In addition, District internal special status species mapping resources, buffer zones established on the CNDDB webpage, and an interactive species location map (https://www.epa.gov/endangered-species/san-francisco-bay-area-map-tool-identify-interim-pesticide-use-limitations) should be consulted. The interim use limitations remain in effects until USEPA completes effects determinations for four pesticides named under the 2015 revised settlement agreement for the Center for Biological Diversity v. EPA. The effects determinations are expected to be completed by 2020.
34	Glyphosate Use Reduction – Where feasible, the District shall reduce the use of glyphosate in its preserves. For IPM projects currently utilizing glyphosate as a management tool, the District shall identify suitable sites to implement alternative treatment methods. The District shall seek to replace glyphosate with the safest available, broad-spectrum, post-emergent herbicide with minimal residual soil activity.
35	Trails – To reduce potential staff and visitor exposure to pesticides, no-spray trail buffers shall be established at least 5 feet from any trails, trailheads, or parking lots unless a 24-hour trail closure is observed.
36	Annual Pesticide Literature Review – To inform updates to the IPM Program, the District shall conduct an annual pesticide literature review of all newly published toxicological research and court proceedings related to pesticides on the "Approved Pesticides List."
37	Insect Repellents and Water Quality – To protect water quality and aquatic organisms, District Staff shall not come into contact with a water body when skin, boots or clothing is contaminated with insect repellents.

Appendix 3.0-2b Maintenance Operations Manual

7 - Vehicle Operations	Section 07.005
	Page 1 of 1
Title: Specialized Utility Vehicles – Procedures for Use of	04/23/2019

I. Purpose

To assure proper training in the use of all-terrain vehicles (ATVs) and Specialized Utility Vehicles, such as 2wd Rokon, Ubco eBike, Bobcat utility vehicle, and Quad Runners.

II. Policy

All Maintenance Staff will complete an ATV safety training before operating any District Quad Runner. Before operating the 2wd Rokon, fuel-powered utility vehicles, or electric utility vehicles, Maintenance Staff will be required to take safety training and operating procedure checkout by a District-trained and designated Maintenance Staff member. In addition, Maintenance Staff will complete daily check out of the equipment before use and wear all required safety equipment appropriate to the piece of equipment being used or driven.

III. Procedure

A. Maintenance Staff must complete ASI training before operating an ATV (Quad Runner)
    1. After ASI training staff will be given an in-house checkout on ATV operation.

B. Maintenance Staff will be given in-house checkout on other Specialty Utility Vehicles, 2wd Rokon and 2wd Ubco ebike including training on properly loading/unloading and securing the Specialty Utility Vehicles on a trailer or in a truck bed.
    1. Maintenance Staff shall be trained in the use of trailers before towing the ATV on a trailer.

C. Maintenance Staff must complete a daily check out of equipment before use.

D. Seasonal OSTs may operate the Specialty Utility Vehicles after completing the District safety checkout. See Maintenance, Construction, and Resource Supervisor's list of vehicles approved for seasonal Maintenance Staff use.

E. All Maintenance Staff will operate vehicles at appropriate speeds within the preserves 15 mph maximum, and 5 mph when passing pedestrians, bicycles, and horses.

F. Maintenance Staff will not operate the District patrol motorcycles.

8 - Equipment Operations	Section 08.008
	Page 1 of 1
Title: Equipment Servicing	04/23/2019

I. Purpose

To assure all District heavy equipment are routinely serviced and daily/periodic inspections are completed to keep equipment in proper operating condition.

II. Policy

Maintenance Staff using heavy equipment are responsible for checking equipment before use and determining when routine service is required

III. Procedure

A. Routine service and maintenance of District tractors will be completed by the Equipment Mechanic Operator, qualified District Maintenance Staff, or a designated vendor.

1. Routine service can include daily inspections and various inspections based on hours of use, mileage, or on a calendar schedule.
2. Appropriate records of recurring inspections or service should be maintained depending on the needs for the equipment.

8 - Equipment Operations	Section 08.016
	Page 1 of 1
Title: Spotting & Equipment Signing During Heavy Equipment Operation	04/23/2019

I. Purpose

To assure visitor and employee safety while operating heavy equipment on District lands.

II. Policy

When heavy equipment is being operated, warning signs or trail closure signs will be placed on all roads and trails leading into the work site. In addition, a spotter will be present to warn operator of and control visitors around the equipment.

III. Procedure

A. The Maintenance, Construction, and Resource Supervisor who is responsible for the project shall ensure that as many spotters as necessary are assigned to ensure scene security and safety.

B. Refer to Safety Manual sections 1.6.5.15 and 1.6.5.16, Tractor and Heavy Equipment Work Site Safety.

C. Heavy equipment is defined as any equipment that may be sat upon, and that is used for earth moving and/or vegetation removal.

8 – Equipment Operations	Section 08.017
	Page 1 of 1
Title: Diesel Engine Idling Policy	04/23/2019

I. Purpose

To assure all Maintenance Staff are following the California Air Resources Board and California Code of Regulations Title 13 for diesel engine idling. *Italicized sections are from the ARB informational advisory.*

II. Policy

When operating or using any diesel fueled vehicle or equipment, Maintenance Staff will not allow the engine to idle for more than five consecutive minutes.

"*No vehicle or engine subject to the in use, off-road diesel regulation may idle for more than five consecutive minutes. The idling limits took effect on June 15th, 2008, the day that the off road diesel regulation became effective under California law."*

Please contact a District Maintenance, Construction, and Resource Supervisor for more information if this policy is unclear or if there are additional questions.

III. Procedure

A. If Maintenance Staff needs to be away from equipment for an extended period, Maintenance Stuff will shut down engine so it does not exceed the five-minute idling regulation.

B. There is an exception to this policy and ARB regulation: if Maintenance Staff is actively using the equipment, i.e., dragging material to feed into a chipper, loading a bucket of a tractor, etc., then the equipment can continue to idle while actively working.

C. Examples of when idling limit does not apply:

1. Idling when waiting in line is allowed (Idling to wait for other vehicles or materials is not allowed)
2. Idling to accomplish secondary functions, such as, concrete agitation, load hoisting, PTO operation, or other necessary function is allowed.
3. Idling to keep equipment (including equipment windows) clear of ice and snow is allowed.
4. Idling to provide air conditioning or heat to ensure the health and safety of the operator is allowed.
5. Idling to test or repair a vehicle/equipment is allowed.
6. Idling to warm up a vehicle/equipment to operating temperature as specified by the manufacturer is allowed.

D. Any changes or updates to California Code of Regulations or Air Resources Board regulations for Idling Limits will supersede this policy.

13 - Fire Prevention and Fire Operations	Section 13.005
	Page 1 of 1
Title: Fire Operations - Maintenance Staff	04/23/2019

I. Purpose

To define the scope of responsibility to participate in the District's Fire Suppression Program.

II. Policy

All Equipment Mechanic Operators and Maintenance, Construction and Resource Supervisors are required to participate in the Fire Suppression Program.

Other Maintenance Staff may voluntarily participate in the District Fire Suppression Program within the scope of the District's provided training and expectations.

III. Procedure

A. Mandatory training for participants in the Fire Suppression Program:
   1. Basic 32-hour Wildland Firefighter training (S-130 or equivalent)
   2. Annual wildland firefighting refresher (RT-130 or equivalent)
   3. Annual Fire Shelter training refresher
   4. ICS-100 training (ICS-200 training for supervisors and water tender operators)
   5. Pass annual fitness test per current standards
   6. Required training for water truck operators is covered in the training outline and includes water operations, driving, vehicle operation, and working in a fire suppression setting. Training includes annual in-house training and annual training with coastal fire agencies.

B. Recommended training for participants in the Fire Suppression Program:
   1. Annual training in progressive hose lays, pumper operation, hand-line construction, and other appropriate tasks
   2. Live fire training whenever possible
   3. Periodic participation in multi-agency wildland fire training
   4. Participation in District Fitness Program to maintain conditioning

C. Maintenance Staff typically participates in fire suppression activities under the direction of qualified personnel, which may include more experienced District Staff and/or Fire Department personnel.

D. Right to refuse a task:
   1. If assigned a task that is beyond the skills or experience of a Maintenance Staff member participating in the District's Fire Suppression Program, that Maintenance Staff member has the right and the responsibility to respectfully advise the supervisor/lead why they cannot implement the request.

13 - Fire Prevention and Fire Operations	Section 13.008
	Page 1 of 2
Title: Prescribed Fires and Burn Piles	04/23/2019

I. Purpose

Define the recommended procedures for conducting prescribed fires and pile burns.

II. Policy

Maintenance Staff should conduct prescribed fires and pile burns in a safe, legal manner.

III. Procedure

A. Prescribed fires

1. The District can only conduct prescribed fires with the approval of the Natural Resources Department under the direction of an appropriate jurisdictional fire agency.
2. Maintenance Staff should only participate in prescribed fires (including off-site prescribed fires) within the scope of their training at the District approved Basic Wildland Firefighter level.

B. Pile Burns

1. Permit required
    a) Bay Area Air Quality Management District—must be a permissive burn day
2. Required Notifications
    a) Natural Resources Department Manager, Visitor Services Department Manager, Resource Advisor, Land and Facilities Services Department Manager, Area Manager, Maintenance, Construction, and Resource Supervisor
    b) Other field office
    c) Administrative Office front desk
    d) Radio Dispatch
    e) BAAQMD permit and notification based on their current procedures
    f) Local fire jurisdiction just prior to burn—often the local station will notify their dispatch center
    g) Any other County or fire jurisdiction that is likely to receive phone calls regarding the smoke or fire
    h) Notify neighbors who have concerns or who have asked for notification.
    i) Radio Dispatch should be notified at the end of a burn.
3. Pile burning limitations
    a) Responsible Maintenance Staff member on the day of the burn must make a final determination that it is safe to burn considering all the potential hazards, regardless of the burn day status or permission to burn.
    b) Appropriate conditions for smoke dispersal will be a consideration of whether

to burn or not even if all other permit requirements are met.

c) Material to burn is only locally cut natural vegetation; no debris.

d) Material should be sufficiently dry.

e) Size of pile may be regulated by local jurisdictions.

f) Material should be piled to burn quickly with minimum smoke.

g) Material must not be under tree canopy.

h) Sufficient water is present to extinguish the fire if needed.

i) Fire shall be monitored by Maintenance Staff until it is completely extinguished.

j) Burning only occurs between 1000 and 1600 with the fire completely extinguished (CAL FIRE time restraint – other jurisdictions may be different).

k) BAAQMD or local fire jurisdiction may have additional requirements—read the information provided on the permit.

l) Generally, the Personal Protection Equipment (PPE) should be the same for pile burning as for wildland firefighting (not necessary to wear fire shelter).

m) During the burn, always have a means of communications and know whom to call if things go wrong.

13 - Fire Prevention and Fire Operations	Section 13.010
	Page 1 of 3
Title: Safe Use of Equipment in Wildlands	06/13/19

I. Purpose

Reduce the risk of fire ignition in wildlands while operating equipment from which a spark, fire, or flame may originate.

II. Policy

Maintenance Staff must carry out all procedures in a manner that ensures safe operation of equipment to minimize risk of starting a fire in a wildland. Hired or contracted private equipment must meet the requirements of this policy.

III. Procedure

A. Equipment Inspection

1. Prior to use, inspect equipment for safe and operational condition, including a functional spark arrestor (re: Public Resource Code [PRC] 4442).

B. Weather Check

1. ***High risk*** operations (flailing, masticating, disking, grading in heavy brush, operating a mower or brush cutter equipped with metal blades, welding, grinding, etc. or any operation given current conditions that could start a fire) within or adjacent to any wildland areas will be conducted using the following protocols::

   a) Whenever possible, complete projects with potential to start fires in wildland areas outside of Fire Season (May 1 through November 30, or as declared by the District) and plan operations so that areas of greatest risk are mowed early in the day.

   b) No high-risk operations shall occur within a red flag area during a red flag event or within 24 hours of a predicted red flag event as determined by the National Weather Service.

National Weather Service Monterey Office Website: http://www.wrh.noaa.gov/mtr/

   c) Before beginning high-risk operations, a weather sampling will be taken. . Weather samples will be taken every 2 hours if the ambient temperature is below 80 degrees Fahrenheit. Weather samples will be taken hourly if ambient temperature is at or over 80 degrees Fahrenheit. If one of the following conditions occur and the ambient temperature is at or over 80

degrees Fahrenheit, **operations should not start.** If one of these conditions occur while running equipment, **all operations should cease immediately**.

(1) RH (relative humidity) is at 30 percent or lower.

(2) Sustained wind speeds reach 10 mph or higher.

d) Maintenance Staff should assess the surrounding wildland fire risk conditions and make a judgment regarding what would be threatened if a fire got started. Maintenance Staff may choose to stop activity at a lower threshold than described above if it is determined to be a risk to life or property.

e) If ambient temperature is, 95 degrees Fahrenheit or higher, all high-risk operations will cease for remainder of shift.

f) If a fire district within District boundaries recommend a moratorium on mowing due to conditions, and we are aware of the moratorium, staff will not operate within their jurisdiction. Unless Area Manager contacts and informs the fire district of our mowing operations and deems staff can continue, and we are operating within our guidelines.

C. Operation

1. Be aware of risks related to driving and parking in tall, dry grass—particularly with catalytic converters.
2. Have an “Action Plan” in mind if a fire starts and have an “Escape Plan” if it gets beyond your ability to control with suppression equipment on-hand. Plan how to communicate with nearby coworkers or others threatened by fire.
3. If possible plan mowing operations so that prevailing wind will blow over areas that have already been mowed. If a fire starts, it will initially burn in mowed grass with a better chance of stopping the fire early.
4. Before starting *high-risk* operations using tractor mowers on District roads, a non-divertible pumper-equipped pickup will be assigned to the operation. An observer that is familiar with pumper operations; vehicle radio; must staff the truck. .. The employee acting as spotter will be in close proximity to *high-risk* operation.

a) Any deviation from having a pumper truck and spotter on site must be approved by Area Manager.

5. When operating a hand mower or small riding mower, staff must have one round point shovel with an overall length of at least forty-six (46) inches backpack pump water-type fire extinguisher available in the immediate area.

6. When on or near a wildland and operating **stationary** power equipment such as a generator, motor, welder, cutting torch, grinder or similar device from which a spark, fire, or flame may originate, ***all*** of the following are required (re: PRC 4427):

   a) Clear away all flammable material around the area for a distance of 10 feet.

   b) Have one round point shovel with an overall length of at least forty-six (46) inches backpack pump water-type fire extinguisher available in the immediate area.

7. When operating chainsaws and other **portable** gas-powered tools in a wildland, ***one*** of the following is required for use within 25 feet of the area (re: PRC 4431):

   a) One round point shovel with an overall length of at least forty-six (46) inches ***or*** a fire extinguisher appropriate to provide fire control for the area and conditions.

D. Fueling

1. When fueling equipment, allow it to cool where there is no flammable vegetation that can be ignited by the hot exhaust, preferably in a dirt area.

2. See Safety Manual Chapter 1.7.00 regarding fire prevention requirements and Sections 1.6.5.4 to 1.6.5.7 regarding safe fueling of equipment.

14 - Hazardous Materials Operations	Section 14.005
	Page 1 of 2
Title: Hazardous Materials Incidents	04/23/2019

I. Purpose

To provide guidelines on dealing with hazardous material spills or contained hazardous materials (HazMat) found on or near District property.

II. Policy

All Maintenance Staff shall follow the guidelines provided in the Annual Hazardous Waste Operations and Emergency Response First Responder Awareness (HAZWOPER FRA) training when dealing with HazMat incidents. Additional training shall be provided to contain or clean up small spills of known products. The Federal Department of Transportation Emergency Response Guidebook defines small spills as 55 gallons or less.

III. Procedure

A. Hazardous materials can include a wide variety of products such as paint, fuel, oil, anti-freeze, rat poison, fertilizer, asbestos, lead, batteries, pesticide, or any product that may cause harm to the person handling it.

B. If there are any concerns about the safety of handling of a product, stop and contact a Maintenance, Construction, and Resource Supervisor.

C. Refer to procedures contained in the Safety Manual Hazardous Materials Response Guidelines section 1.11.2.0.

D. Maintenance Staff shall be trained to HAZWOPER FRA level before handling any hazardous materials incident.

E. Hazardous material discovered during work time

1. Follow procedures from HAZWOPER FRA course.
2. Notify a Maintenance, Construction, and Resource Supervisor.
3. If material is not contained or material is not on District property, notify Radio Dispatch and a District Ranger for a response from the jurisdictional HazMat Agency.
4. Do not bring any hazardous materials back to the office without Maintenance, Construction, and Resource Supervisor approval. A Maintenance, Construction, and Resource Supervisor may allow transport of a known product if safe transport, storage, and disposal exist.

F. Incidents where Maintenance Staff may take action to contain or clean up a spill

1. Herbicide spill by Maintenance Staff
   a) District shall provide training to contain or clean-up small herbicide spills. Information about herbicide spill procedures are in the herbicide binder that must be on site for any herbicide application.
   b) Maintenance Staff must know what chemical is spilled and what absorbent is appropriate to pick up the substance (oil-based or water-based).
   c) All contaminated absorbent, soil, or other materials shall be properly contained for transport and disposal.
2. Small fuel, oil, paint, or anti-freeze spill by Maintenance Staff
   a) Promptly place a bucket or plastic sheet under the source of the spill to

contain further contamination.

b) Use rags to absorb and dispose of in waste rag bin (use caution with linseed oil coated rags for risk of spontaneous combustion).

c) If necessary, use absorbent material such as cornhusk or pillow.

d) Promptly sweep up absorbent and place in an appropriate container.

e) Confirm with Maintenance, Construction, and Resource Supervisor how to dispose of absorbent. Some absorbents can be placed in Mixed Waste Fuel disposal drum, some cannot.

f) If needed, dig up soil surrounding spill and place contaminated soil in appropriate container. Consult with a Maintenance, Construction, and Resource Supervisor regarding proper disposal.

3. Large spill of fuel (e.g., rupture of fuel storage tank)

   a) Make careful evaluation of safety of attempting containment

   b) Dam flow if safe to do so

   c) More likely, evacuate area and notify Maintenance, Construction, and Resource Supervisor and agency with jurisdiction to respond.

4. Any spill not caused by Maintenance Staff (such as a contractor or other incident) should be managed by the contractor or agency with jurisdiction over the incident until a Maintenance, Construction, and Resource Supervisor directs Maintenance Staff to take action.

5. Maintenance Staff may assist a contractor with containment if the substance is known and they have appropriate training until the contractor can take over clean-up with their own resources.

G. Refer to Facility Emergency Action Guidelines for specific issues at each facility.

14 - Hazardous Materials Operations	Section 14.006
	Page 1 of 4
Title: Hazardous Materials Handling, Storage, and Disposal Procedures	04/23/2019

I. Purpose

To define the proper procedure for handling, storage, and disposal of hazardous materials/waste.

II. Policy

The District will provide Maintenance Staff with the appropriate training, tools, personal protective equipment, and procedures to properly address hazardous materials/waste during the performance of their job.

All Maintenance Staff will follow the procedures outlined in this policy and in their annual training. All Maintenance Staff are required to handle, store, and dispose of hazardous materials in the safest manner possible.

III. Procedure

Definitions:

"Hazardous Material" Any item that can cause injury or damage to people or the environment.

"Hazardous Waste" A byproduct of operational processes that can be harmful to humans or the environment and must be disposed of in a safe manner.

Refer to Safety Manual section 1.11.2.0, Storage and Disposal of Hazardous Materials.

A. Minimizing hazardous materials in the workplace

1. Choose materials/products based on researching their hazard to employees.
2. Choose products that are least hazardous whenever possible.
3. Do not buy or use products that staff do not have the means (training, personal protective equipment [PPE], etc.) to use safely.
4. Obtain a Safety Data Sheet (SDS) from the manufacturer.
5. Use engineering controls (such as venting or use of a different product) to minimize risk whenever possible.

B. Training

Maintenance Staff must be trained in proper handling, types of hazards, PPEs, first aid, and spill cleanup for any hazardous material/waste that they use in the workplace. Training must be provided prior to handling hazardous materials/waste, after any change in procedures, or after any new hazardous material/waste is introduced into the workplace.

C. Storage, use, and transport of hazardous materials/waste:

1. All hazardous materials must be labeled with:
   a) The name of the product (in a form that can be used to easily locate the SDS).
   b) The manufacturer's name (including address) and any acute hazards (such

as “Poison” or “Flammable”).

c) Other information as required (such as “Keep Away from Children”).

d) If possible, use the original container for the product that includes use and spill information. If using service container, be sure enough information is available to quickly identify the product after an incident and easily locate the SDS for required information.

2. Secondary containment requirements – All hazardous materials/waste should be stored and transported with appropriate secondary containment. Office and vehicle cleaning products do not need to be placed in secondary containment.

a) Do not mix or store incompatible items such as bleach with oils in the same secondary containment or location.

3. Use of proper containers

a) Correct can type for transporting fuel

b) Proper labeling for containers holding hazardous materials

4. PPE must be worn as directed by the product label and SDS.

5. Sources of information and procedures

a) SDS

b) Product label

c) Training

D. Disposal of hazardous waste

1. Universal wastes are hazardous wastes that are widely produced by households and many different types of businesses. Universal wastes include televisions, computers, and other electronic devices as well as batteries, fluorescent lamps, mercury thermostats, and other mercury containing equipment, among others. The disposal process is streamlined for these common items.

a) Do not dispose of in trash.

b) Wastes should be labeled with a Universal Waste sticker and disposed of within one year.

c) As a small generator, have less than 5,000 pounds of waste at any one time.

d) Training required

(1) Can be written information or posting at site where waste is generated and handled.

(2) Includes safe handling information and clean-up information

2. Oil (and similar mixed waste) and waste fuel – Container needs to be labeled with proper sticker containing information about the contents, generator, accumulation

start date, and Environmental Protection Agency (EPA) ID number.

a) Containers must be inspected weekly.

b) Containers must be closed when not in use.

c) Containers must be compatible with product stored.

d) Containers must be secured to prevent rupture or leaks.

e) Disposal of these items must be handled by a registered hazardous waste transporter and will require a hazardous waste manifest.

f) Two copies of the manifest stay with the generator. One must be kept on file for 3 years, the other must be sent to the California Department of Toxic Substance Control within 30 days. A copy of the manifest acknowledging receipt must be received within 45 days. If it is not received, notify the Department of Toxic Substance Control within 60 days.

g) Alternatively, small containers (under 5 gallons) can be transported to hazardous waste disposal site without manifest procedures. Place receipt for disposal with hazardous waste disposal records.

h) The container can be kept for one year or until full, whichever comes first.

3. Disposal of all other hazardous waste should be handled through a Maintenance, Construction, and Resource Supervisor

a) Materials may be transported to a disposal facility, such as a site set up by Santa Clara or San Mateo County for the purpose of accepting business hazardous waste by appointment.

b) Materials may be disposed of by contract with a company that is an authorized hazardous materials disposal company.

c) Some items, such as car batteries, may be taken to sites like auto parts stores.

d) Many online references are available for identifying current places that handle disposal of waste.

4. Storage and disposal of Treated Wood Waste (TWW), follow Santa Clara County Department of Environmental Health protocols.

a) All pressure-treated/creosote-treated wood waste must be treated as a hazardous material and must be stored and disposed of properly.

b) TWW should be stored in a covered area away from the weather and properly labeled until disposal (typically 30 days after accumulation start).

c) TWW must be disposed of at a facility that accepts TWW, and a hazardous waste manifest must be obtained from the facility before transport.

(1) Alternatively pressure-TWW can be disposed of at a facility that accepts the waste without a manifest. Obtain a receipt of disposal and put in hazardous waste disposal records.

E. The California Department of Toxic Substance Control is the oversight agency for all hazardous materials.

1. Santa Clara County Department of Environmental Health (Hazardous Materials Compliance Division) permits to handle and store hazardous wastes as a small

quantity generator (less than 100 kg per year).

a) Annual fee

b) Business Plan – annual updates

2. California EPA identification number

a) Annual fee to maintain – must have number to dispose of hazardous wastes

b) Must be maintained for each site that generates waste

c) To remain a Conditionally Exempt Small Quantity Generator, must generate less than 100 kg per month of hazardous waste

17 - Pesticide Program	Section 17.005
	Page 1 of 2
Title: Pesticide Use	04/23/2019

I. Purpose

To provide guidelines for safely and effectively applying pesticides.

II. Policy

Used properly, herbicide (a pesticide) is an effective tool for managing vegetation. Pesticide storage and use are regulated by county, state, and federal law. It is the District's policy to adhere to applicable laws. Any Maintenance Staff member applying herbicide on District property shall follow the following guidelines. Only District approved herbicides shall be used; the Approved Pesticide List is maintained on the Natural Resources Department Sherlock SharePoint site.

III. Procedure

A. All Maintenance Staff applying herbicide must complete the annual safety training. This is offered in-house by a Qualified Applicator or Pest Control Advisor and covers topics specified by state law. Application location and technique must be consistent with the Pest Control Recommendation and the current District IPM Guidance Manual and Best Management Practices. A Daily Use Report shall be approved by the Maintenance, Construction, and Resource Supervisor, completed and returned promptly. The day's activities shall be recorded onto CalFlora within 24 hours of an application.

B. An Applicators Binder must be in possession or carried in the vehicle at the time of application. It contains:

1. Safety Data Sheet for herbicide being used
2. Product label
3. Copy of Pest Control Recommendation
4. IPM Program Best Management Practices
5. Pesticide Safety Information Series Brochures
6. Daily Use checklist
7. Emergency Procedures – Including a list of nearby hospitals
8. Copy of the Operator Permit
9. Other useful information (i.e. mixing chart)

C. Maintenance Staff must be checked out on specific types of pesticide and their application equipment, application techniques, and mixing procedures (e.g., backpack sprayer) prior to use.

D. Proper Personal Protective Equipment (PPEs) listed below must be worn while mixing or applying herbicide. Follow specific guidelines on product label and SDS.

E. Eye protection must be worn at all times. Splash resistant goggles must be worn when mixing or spraying alone. Approved safety glasses with brow guards and side shields must

otherwise be worn.

1. Long sleeve shirts and long pants
2. At least 14 mil nitrile unlined gloves
3. Boots with socks (rubber boots if walking through wet vegetation)
4. Optional Tyvek suits and booties are encouraged to be worn if the nature of the application may result in product being splashed on the applicator.

F. After applying herbicide, all outwear and boots should be cleaned prior to leaving the job site to avoid contaminating vehicles and offices.

G. Maintenance Staff shall ensure that appropriate safety equipment is available and is used. Appropriate safety equipment includes:

1. Eye wash equipment
2. Spill containment materials
3. An extra full Tyvek suit for each person on the job site

17 - Pesticide Program	Section 17.006
	Page 1 of 1
Title: Pesticide Use - Public Notification of	04/23/2019

I. Purpose

To provide guidelines for notifying the public, employees, and contractors of pesticide application on District preserves.

II. Policy

Prior, during, and after the application of a pesticide (including herbicides, insecticides, or other types of pesticides) on District preserves, employees or contractors will post signs at the treatment area notifying the public, staff, and contractors of the District's use of pesticide. Use the appropriate warning sign located on the Natural Resources Sherlock website.

III. Procedure

A. For pesticide application in all preserves, post treatment area 24 hours prior to the start of treatment and 72 hours after the end of treatment. Signs can be up no longer than two weeks. **Exception:** Pesticide application for human safety and health (e.g., wasps) do not need the 24-hour prior notice.

B. Signs stating "Herbicide Treated Area" will be placed at each end of the treatment area and any trails intersecting the treatment area.

C. The information contained in the postings will include signal word, product name and manufacturer, active ingredient, EPA registration number, target pest, preserve name, treatment location in preserve, date and time of application, date which notification sign may be removed, and contact person with telephone number.

D. Maintenance Staff and contractors will be subject to "Restricted Entry Interval" (REI) consistent with the product label or the Pest Control Recommendation, whichever provides a longer period. If Maintenance Staff or contractors need to re-enter the treatment area prior to the end of the REI, they must follow all conditions of the label or Pest Control Recommendation such as wearing personal protective equipment.

E. Pesticide application at Rancho San Antonio County Park will be consistent with the Santa Clara County Parks and Recreation Department's Integrated Pest Management Program including any prior reviews and approvals required by the County.

F. Any exceptions to this notification policy should be rare and compelling and considered on a case-by-case basis by the Natural Resources, Land and Facilities Services, or Visitor Services Department Manager. Exceptions should be reported to the Integrated Pest Management Coordinator within 24 hours.

Appendix 3.0-2c Safety Manual

and trail machines.

1.6.1.1 Any employee with knowledge of any equipment that may be unsafe to operate shall tag it out of service and its use must cease. Red "DANGER" tags shall be used to "tag out" an item, and a supervisor will be notified

1.6.2.0. Qualifications and Authorization of Operators

1.6.2.1. District personnel shall operate only the equipment which they have been qualified and authorized to use.

1.6.2.2. Apprentices or trainees shall operate equipment only under the direct supervision of a skilled operator.

1.6.3.0. Standard Safety Features

1.6.3.1. Machine equipment will be outfitted with appropriate safety features for District use.

1.6.3.2. If safety features are damaged, defective, or missing, the equipment will not be operated.

1.6.3.3. Heavy equipment shall be equipped with an automatic back-up warning device. However, it is still the operator's duty to check that it is clear behind before backing.

1.6.3.4. Provide all gears, sprockets, drive belts, chains, pulleys, drums, and fans with guards when practicable. Guards must not be removed or made ineffective except for repairs.

1.6.4.0. Auxiliary Safety Supplies

1.6.4.1. On every equipment job, keep a basic set of safety supplies close at hand:

a. First Aid kit
b. Fire extinguisher
c. Personal protective equipment.

1.6.4.2. In addition to those supplies mentioned above, the job may call for chock blocks, "Slow Moving Vehicle" sign, red flagging for loads, traffic cones and vests for traffic control, flares, spill kit, etc. Each supervisor must see that these and any other needed safety supplies are on hand at all times during operation.

1.6.5.0. Operating Procedures

1.6.5.1. Before starting on each day, check out the machine in accordance with the operating procedure for the specific equipment.

a. Check the oil level; fill up if necessary.
b. Check the coolant level; top up if necessary.
c. Check the tires.

d. Check for loose or missing nuts, bolts, and pins. Replace or tighten as needed.
e. Lubricate grease points according to manufacturer's recommendation.
f. Check fuel.
g. Check battery.
h. Check radiator and screen.

1.6.5.2. Important: The surest way to keep your machine in safe operating condition is to follow the Operator's Manual for that machine.

1.6.5.3. IF YOU DO NOT HAVE A MANUAL FOR A PIECE OF YOUR MACHINE EQUIPMENT, REQUEST ONE.

1.6.5.4. Stop the engine before refueling.

1.6.5.5. Never remove the fuel tank cap or fill the tank while the engine is running, or when it is near open flame.

1.6.5.6. When pouring the fuel, keep the hose and nozzle or funnel and container in contact with the metal of the fuel tank to avoid a static spark.

1.6.5.7. NO SMOKING while refueling.

1.6.5.8. Leave a safe distance between you and operating equipment. Make sure the operator is aware of your presence and location at all times.

1.6.5.9. Never go under, or in dangerous places around equipment without notifying the operator. Leave a note on the control panel if necessary.

1.6.5.10. Never start up without double checking that the "coast is clear." Put the transmission in neutral and depress the clutch fully before starting. On some machines a SAFETY STARTING SWITCH is provided, making it impossible to crank the engine unless the transmission is in neutral and/or the clutch depressed.

1.6.5.11. When the machine is stopped and engine idling, place the transmission in neutral and engage the master clutch (if applicable) and drop blades or loader to prevent the machine from being jarred into motion.

1.6.5.12. Never get on or off moving equipment or equipment that is stopped without first notifying the operator.

1.6.5.13. Permit no one to ride on the seat with the operator.

1.6.5.14. PRACTICE DEFENSIVE OPERATION AT ALL TIMES. This means:
a. Understand the operating limitations of the equipment and operate within those limitations at all times.
b. Avoid doubtful or spectacular operations.
c. Avoid hazardous situations created by ground, weather, or fire conditions.

1.6.5.15. Tractor and heavy work equipment site safety

a. Projects involving the use of tractors and heavy equipment often require employees to perform a variety of related tasks in conjunction with the operation of the equipment. Safety at the work site is the responsibility of every employee present. The work site shall be under the direction of the employee operating the equipment, unless direction of the project is otherwise assigned by a supervisor.
b. Before starting work each day, or each time there is a significant change in the safety needs of the work site, the employee directing the project shall review work site and visitor safety procedures with all employees assigned to the project.
c. Any work site condition that compromises the safety of any employee or visitor shall be corrected immediately. If it cannot be corrected, work must be stopped and a supervisor notified immediately.
d. When equipment is being operated in visitor use areas, warning signs will be placed on all roads and trails leading into the work site.
e. Employees assigned spotter duties at stationary work sites shall be out of the vehicle and available to contact visitors entering the work area. Spotters may remain in the vehicle on projects where the equipment is continually moving in the same direction, such as road or trail grading or mowing, only if visitor traffic can be effectively controlled from the vehicle.

1.6.5.16. Always have a spotter at the worksite or nearby, except when mowing in grassland areas where the potential for accidents is extremely low. Heavy equipment operators shall have a portable radio at all times.

a. The spotter shall not permit visitors to enter the work site until the equipment operation is stopped and the operator is aware of the visitor's presence. The spotter will then either escort visitors or allow them to pass through the work site.
b. Any deviation from these procedures must be approved by a supervisor.

1.6.6.0. Equipment Inspection

1.6.6.1. When machinery or equipment, including rentals, is received, remodeled, or repaired, it shall be the responsibility of the operator to see that it is inspected for safe operating conditions before it is operated.

1.6.6.2. Inspect your equipment daily. You and your supervisor should work out a checklist to make sure all key items are covered.

1.6.6.3. Where safety of the operator, crew or equipment is concerned, a defective machine shall be shut down and conspicuously "tagged out" until repairs are made.

1.6.7.0. Transporting Equipment

1.6.7.1. Check the route of travel before transporting. Look for overhead and side clearance, culverts and bridges, and overhead lines.

1.6.7.2. The operator must know the weight, width and height limits set by the Vehicle Code and comply with State requirements for flagging, signaling, and signing, such as "Wide Load" or "Slow Moving Vehicle" signs.

1.6.7.3. When necessary, heavy equipment shall be blocked lengthwise and sideways on truck or trailer beds. It must be bound securely both front and rear or on both sides with chain or cable and tightened with load binders.

1.6.7.4. Planks, chains and other loose items on trucks or transports must be crated or secured before moving.

1.6.7.5. Only essential personnel shall be near the transport while loading or unloading equipment.

1.7.0.0. FIRE PREVENTION

1.7.1.0. General

1.7.1.1. The fire prevention program shall include: 1) provision for regular training sessions, 2) regular fire safety inspections, 3) upkeep of fire-fighting equipment, 4) evacuation

plans, and 5) storage of flammable materials.

1.7.1.2. Following adequate training, all personnel shall know and understand the fire protection plan for their area, including 1) fire safety inspection, 2) location and proper use of fire extinguishers, 3) proper storage and handling of flammables, and 4) evacuation plans.

1.7.2.0. Forest, Brush and Grass Fire Prevention

1.7.2.1. Fire suppression equipment will be kept in a ready condition commensurate with the level of fire danger.

1.7.2.2. Refer to Maintenance Operations Manual (MOM) for maintenance equipment operations during fire season.

1.7.3.0. Office, Shop and Storage Facilities

1.7.3.1. All structures and storage facilities shall be designed, constructed and maintained according to national, State and local fire codes as applicable.

1.7.4.0. Special Fire Safety Rules

1.7.4.1. Provide facilities for the safe storage of flammables at all installations.

1.7.4.2. Post "NO SMOKING" signs on the inside and outside of all buildings and locations where flammables are stored.

1.7.4.3. Smoking, open flames or sparks shall not be permitted within 50 feet of where flammables are stored or used.

1.7.4.4. Containers containing flammables should be tagged to show contents. These containers must be tightly shut when not in use.

1.7.4.5. When filling containers, leave a vapor space above the liquid level to permit expansion with rising temperatures.

1.7.4.6. Do not allow smoking, open flame, or sparks when checking or charging wet-cell batteries.

1.7.4.7. No one shall work in clothing saturated in flammables.

1.7.4.8. Keep flammable liquids away from radios or other non-vaporproof electrical equipment in unventilated places.

1.7.4.9. Observe the refueling rules in section 1.6.5.4. to 1.6.5.8.

1.7.4.10. Never store or transport flammables with flashpoints below 100 degrees F. in unapproved plastic or glass containers. Gasoline (flash point = 45 degrees F.) may be stored only in approved containers.

1.7.4.11. Maintain CLEAR SPACES and READY ACCESS to fire extinguishing equipment, hydrants and electrical panels at all times.

1.7.4.12. Immediately report any oil, gas or vapor leaks or other fire hazards you may observe to your supervisor. Oil or gas spills should be cleaned up immediately.

1.7.4.13. Fire extinguishers must be kept fully charged, inspected monthly, and serviced annually.

1.7.4.14 Portable fire extinguishers are to be placed within 75 feet of work areas.

1.8.0.0 COMMON OPERATIONS

1.8.1.0. Lifting and Carrying

1.8.1.1. Preparing to lift:

a. Size up the job

1.11.0.0 HAZARDOUS MATERIALS

1.11.1.0. Hazardous Materials Response Guidelines

a. It is important for field staff to be aware of the potential presence of hazardous materials on District lands. The following guidelines will be followed whenever any staff member observes what is believed to be a hazardous material. This includes any abandoned chemicals that may be toxic, flammable, or corrosive; can cause fires or explosions; or may be a serious health or environmental hazard. Response by field staff should be consistent with the training received in the Hazardous Materials First Responder training.
b. If an employee observes what is believed to be a hazardous material, the appropriate fire department shall be notified immediately. A supervisor shall also be notified at once. The supervisor will ensure that all appropriate agencies are notified and that District procedures are followed. Keep a safe distance until material is identified and risk confirmed.
c. Safely attempt to isolate and deny entry by establishing a perimeter around the hazard area.
d. No employee shall handle, transport, or dispose of hazardous materials without authorization from a supervisor.
e. Under no circumstances shall hazardous materials discovered in the field be brought to the field offices.

1.11.2.0. Storage and Disposal of Hazardous Materials

a. Each field office has hazardous waste containers located in the Haz Mat sheds.
    1. No hazardous materials found in the field may be placed in the field office hazardous materials shed or hazardous waste containers.
    2. Only materials generated by the District may be stored in these containers.
    3. Only the Construction and Maintenance Supervisor, or their designee, is authorized to dispose of chemicals in these containers.
    4. All chemicals placed in the containers shall be recorded on a log sheet.
b. Use of the hazardous materials shed and hazardous waste containers are for District use only. No personal use is permitted.

Appendix 3.0-2d Resource Management Policies

SCENIC AND AESTHETIC RESOURCES GOAL, POLICIES, AND IMPLEMENTATION MEASURES

Goal SA- Preserve lands with natural appearance, diversity, and minimal evidence of human impacts

Policy SA-1 Minimize evidence of human impacts within preserves.

- Clarify and document appropriate standards for designing and locating trails, parking areas, and buildings.
- Locate trails to minimize their visibility from a distance.
- Where feasible, locate telecommunication towers, power lines, water towers, firebreaks, and other infrastructure along margins of roads, next to existing structures or where vegetation and terrain help ease undesirable visual and environmental impacts. Install utility lines underground, if practical.
- Cluster new facilities near existing development, where possible.
- Design facilities such as structures, bridges, fencing, benches, and barriers to harmonize with natural landscape features, colors, and materials.
- Cluster, reduce, and place signs to lessen their visual impact.
- Rehabilitate areas degraded by human use by restricting access or type(s) of use, rerouting trails and roads, removing unsightly human-made features and **non-native** plants, restoring natural contours, and revegetating with native plants.

District development consists of facilities such as trails, restrooms, parking lots, fencing, offices, and residences. District facilities are designed to blend into the natural surroundings and are located within or adjacent to previously disturbed areas such as placing parking lots along existing roadways, or improving, remodeling, or placing new structures in previously developed areas.

Policy SA-2 Maintain significant landscapes or features that were formerly maintained by natural processes.

- Control encroaching vegetation where it adversely affects significant scenic, historic or **habitat** resources (See **Vegetation Management**, **Cultural Resources**, and **Integrated Pest** Management policies).

- Control vegetation to create or maintain important scenic viewpoints and vistas (See Vegetation Management and Integrated Pest Management policies).
- Require District tenants to maintain landscapes and improvements to acceptable visual standards that do not detract from a visitor's experience or adversely impact wildlife.

Policy SA-3 Minimize unnatural noise within preserves

- Prevent or reduce unnatural sounds that adversely impact preserves resources or a visitors' enjoyment of them.

WILDLAND FIRE MANAGEMENT GOAL, POLICIES, AND IMPLEMENTATION MEASURES

Goal WF-	**Manage District land to reduce the severity of wildland fire and to reduce the impact of fire suppression activities within District Preserves and adjacent residential areas; manage habitats to support fire as a natural occurrence on the landscape; and promote District and regional fire management objectives.**

Policy WF-1 Implement necessary fire and fuel management practices to protect public health and safety, protect natural **resources**, and to reduce the impacts of wildland fire.

- Prepare wildland fire management plans for District lands that address, at a minimum, public safety, District staff and firefighter safety, District infrastructure including residences and roads, natural resource protection (particularly **special status** species), **cultural resources,** and vegetation management for fire protection and **fire behavior** and hazardous fuels modification.
- Identify, with input from responsible fire agencies and neighboring public agencies, essential roads for wildland fire access. Maintain designated roads for fire access and patrol purposes, and improve with surfacing, additional turnouts and safety zones when necessary.
- Coordinate with fire agencies and local communities to identify locations where additional fire infrastructure is desirable and practical (e.g. hydrants, water tanks, helicopter zones, safety zones, **fuel breaks**, consistent with the **incident command system (ICS**). Work cooperatively with these groups to install needed infrastructure.
- Work with Cal Fire and other appropriate fire management and regulatory agencies to develop and carry out plans that use prescribed burns to maintain and restore natural systems.
- Maintain adequate fire clearance around District structures and facilities. (See FM-5 and WF-4:Measure 5)
- Require lessees of District land or structures to maintain fire hazard reduction measures as directed.

- Prohibit activities that have a high risk of sparking fires during periods of **extreme fire hazard**.
- Close Preserve areas of particular concern during **extreme fire weather**, as appropriate, and increase patrol levels where appropriate.
- Seek grant opportunities and partnerships for fuel management and monitoring projects.

Policy WF-2 Aggressively support the immediate suppression of all unplanned fires that threaten human life, private property or public safety.

- Respond to wildland and structure fires on District lands in coordination with responding fire agencies.
- Prioritize and prepare Preserve specific wildland fire response plans that identify appropriate fire suppression activities for District lands in the event of a wildland fire. Plans should include detailed maps of infrastructure such as roads, fuel breaks, structures, water sources (hydrants, water tanks, ponds), as well as sensitive natural and cultural resources to be avoided during fire suppression activities.
- Direct bulldozer actions to areas identified in wildland fire response plans to minimize and reduce ground disturbance, erosion, and rehabilitation efforts wherever possible.
- Develop guidelines for appropriate rehabilitation measures to address erosion, **revegetation**, invasive species, trail and road stability, security, public safety, and natural and cultural resources following fires.

Defensible space is the area adjacent to a structure where basic wildfire protection practices are implemented, providing a key point of defense for an approaching wildland fire or area to escape from a structure fire. Cal Fire publishes guidelines for fuel (vegetation) treatments to create a perimeter around buildings and structures in order to maintain minimum conditions for firefighters to defend a property.

Policy WF-3 Work with adjacent landowners and fire agencies to maintain adequate fire clearance around qualifying structures. (See FM-5 and WF-1: Measure 5)

- Maintain a permit system that enables adjacent landowners to maintain defensible space clearance surrounding homes and other qualifying structures across property boundaries and onto District land as long as the activity is recommended by the local fire agency and is consistent with the District's resource management policies, including protection of environmentally sensitive habitat.
- Work with fire agencies and local governments to develop requirements for new development to maintain required fire clearance distance from District land wherever possible.

District GHG emissions are divided into administrative emissions, which come directly from District operations such as vehicles and facilities, and non-administrative emissions, which are related to District activities but the District has less control over. A numerical GHG reduction goal is set only for administrative emissions.

- Evaluate the full life-cycle footprint of equipment, services, and supplies, and choose lower impact/responsible services and supplies.
- Develop sustainability guidelines for facilities, operations, projects, and events.

Policy CC-2 Reduce non-administrative GHG emissions related to District activities, such as visitor transportation and livestock.

- Implement Climate Action Plan strategies to reduce or offset GHG emissions from visitor transportation to preserves.
- Implement Climate Action Plan strategies to reduce or offset GHG emissions from livestock, and research additional techniques or technologies.
- Where agricultural sustainability is not a leading factor, select appropriate livestock species to accomplish vegetation management objectives (See GM-4).

Policy CC-3 Increase **carbon sequestration** in vegetation and soils and minimize carbon release from wildfire.

- Manage conifer forests to sustain and encourage the development of late-seral habitat conditions (FM-4). Evaluate the potential to reduce forest fuel loading through the removal of smaller trees to reduce fuel buildup and ladder fuels (See FM-5).
- Manage vegetation communities to reduce the risk of catastrophic fire and to maintain biological diversity (WF-4). Conduct prescribed burns to re-introduce fire into native ecosystems and maintain natural ecological processes on District lands (See WF-5).
- Evaluate, study, and implement additional land management strategies to increase carbon sequestration in vegetation and soils.
- Improve data on carbon sequestration in District lands.
- Evaluate opportunities to create and sell carbon offsets on the California Cap and Trade market or other voluntary offset markets.

Resilience is the capacity of natural and human communities to withstand and bounce back from climate stress and hazardous events.

Policy CC-4 Prepare for climate change impacts and promote **resilience** for both natural and built environments.

- Prioritize ecosystem function, resilience, and ecological diversity focused on multiple species benefits, rather than aiming to prevent ecological change or return to past conditions.

Appendix 3.0-2e Regulations for Use of Midpeninsula Regional Open Space District Lands

SECTION 404. FIRES.

404.1 General. No person shall light, build, maintain, or attempt to light, build, or maintain, a fire of any nature on District Lands, except in permanent fixed barbecues, camp stoves or fireplaces established and authorized by the District. A fire shall include, but not be limited to any campfire, ground fire, warming fire, signal fire, charcoal fire, stove, gas lantern, punk, candle, smudge stick, flare, fusee, or any other incendiary device. This shall not apply to the permitted use of gas camp stoves or gas lanterns when used in Designated Area specified for camping.

404.2 Smoking. No person shall smoke on District Lands, except in Designated Areas.

SECTION 405. SANITATION.

405.1 Disposal of Effluent. No person shall deposit waste water, sewage or effluent from vehicles, trailers, sinks, portable toilets, or other fixtures upon or into the ground or water. Violation of this sub-section is punishable as a misdemeanor.

405.2 Use of Facilities. No person shall deposit any waste in or on any portion of any restroom or other structure except into fixtures provided for that purpose.

405.3 Protection of Facilities. No person shall place any bottle, can, cloth, rag, metal, wood, paper, stone, or other substances in any fixture in such a manner as would interfere with the normal operation of such fixture.

405.4 Defecation. No person shall defecate in Public View or within twenty-five (25) feet of a Designated Trail.

405.5 Urination. No person shall urinate in Public View.

SECTION 406. METAL DETECTORS.

406.1 General. No person shall possess or use a metal detector or similar device on District Lands, except as provided in subsection 702.5.

SECTION 407. DISTURBING THE PEACE.

407.1 Obstructing Free Passage. No person shall by force, threat, intimidation, or by any unlawful signing, fencing or enclosing, or any other unlawful means, prevent or obstruct any person from peacefully entering any District Lands, or prevent or obstruct free passage or transit over or through any District Lands. Violation of this sub-section is punishable as a misdemeanor.

CHAPTER V.
PRESERVE USES - RIDING/HIKING TRAILS

SECTION 500. RIDING / HIKING TRAILS.

500.1 Trail Use Speed Limit. All users of District Lands shall comply with all established trail use speed limits. The maximum speed for all trail uses is 15 miles per hour, unless otherwise posted. Bicyclists and equestrians are required to slow to 5 miles per hour when passing others or approaching blind turns.

500.2 One-way Trails. No person shall operate a bicycle or unicycle or similar device, or ride or lead a saddle horse, pony, mule, or other such animal on a one-way trail in a direction or travel designated or signed to prohibit such use.

500.3 Gates. Any person opening a gate shall close the gate.

500.4 Dangerous Trail Use. No person shall run or jog in such a way as to endanger hikers, equestrians, bicyclists or others using District Lands.

SECTION 501. SADDLE ANIMALS.

501.1 Closed Areas. No person shall ride, drive, or lead a Saddle or Pack Animal on any trail, roadway or established firebreak designated or signed to restrict horse use. Saddle or pack animals must stay on Designated Trails roadways which are Designated Areas for such use, and established firebreaks.

501.2 Unsafe Use. No person shall ride, drive, or lead any saddle or pack animal in a reckless or negligent manner so as to endanger public property, or the life, limb, or property of any person or animal, including the rider. No person shall allow his/her saddle or pack animal to stand unattended or insecurely tied. Violation of this sub-section is punishable as a misdemeanor.

501.3 Carts and Wagons. No person shall possess or operate a cart, wagon, or similar device attached to any animal on District Lands without a written permit.

Appendix 3.0-2f CDFW-Approved SFDFW Protocol

San Francisco Dusky-Footed Woodrat (SFDFW) Protocol

Midpeninsula Regional Open Space District Preserves provide many areas of habitat for SFDFW that is conserved as open space in perpetuity. However in some instances District projects, operations, and/or maintenance activities have the potential to impact SFDFW individuals and/or their nests.

For projects occurring in suitable SFDFW habitat, prior to project implementation, a qualified biologist shall survey the site for evidence of nesting SFDFW *(i.e.,* large stick nests). Since woodrats use their nests year round, surveys for nests may be conducted at any time of the year. If woodrats or their nests are present, a biological awareness training shall be provided by a qualified biologist prior to project implementation.For any woodrat and/or nest that are found within project boundaries, the measures listed below shall be implemented:

In natural areas:

All wood rat nests will be flagged in the field and delineated on project site maps. In all instances, every effort should be made to avoid impacts to woodrat nests. Avoidance, even with a small buffer area is considered preferable to relocation. Avoidance buffers of a minimum of 3-10 feet shall be implemented, flagged where appropriate, and avoided during project implementation. Smaller buffers allow work to occur in close proximity without displacing and relocating individuals each time these activities occur which may be on an annual or recurring basis (defensible space around structures, road and trail side brushing, invasive plant removal etc.). As evaluated by the project biologist, where appropriate to minimize impacts from project activities, fencing will be installed around the nest and include the buffer area. When removing materials from around a woodrat nest be cognizant of tree branches, fencing, or other materials that may support the nest structure. Whenever possible leave these materials in place. However, if they must be removed and the nest may become compromised, live trapping may be necessary.

For all woodrat nests that cannot be avoided by project activities (i.e. will require relocation), a qualified biologist shall live trap to determine if the nest is in use. Trapping activities should occur prior to April and after mid-July each year to prevent impacts to woodrats rearing young or young woodrats. If a nest is found to be unoccupied or not in use for 3 full days (2 nights of trapping), then it may be removed. The nest shall be relocated or a pile of replacement sticks shall be placed outside of the development footprint for future colonization or re-use. If a lactating female is trapped, project actitivies shall be postponed until young have become independent.

Trapped woodrats may be kept in captivity by a qualified biologist until their nests are relocated to suitable habitat outside of the development footprint. Every effort should be made to minimize the time the animal is held in captivity. A CNDDB form shall be filled out and submitted to CDFW for any San Francisco dusky-footed woodrats that are trapped. Once trapped, nests shall be torn down and rebuilt surrounding a log based structure, an inverted wooden planter, or similar structure having at least one entrance and exit hole that is slightly buried into the ground to anchor. Any cached food and nest material encountered shall be placed within the new structure during rebuilding. Whenever possible, the structure shall be "over-built" by adding

larger branches for predator protection to create an area for the individual to safely emerge outside of the nest. One or more persons shall remain outside the release structure for up to 10 minutes to mimic a predator. Relocated nests are intended to provide a release site and opportunity for the woodrats to relocate to another nest (most woodrats average more than one nest and may or may not remain with a relocated nest), or to colonize the new structure.

Once nests are relocated, any trapped woodrats should be released into the reconstructed nest using a "soft release," by plugging the individual into the shelter using loose dirt over the entrance.

Relocated nests are expected to eventually be re-colonized and should be monitored one year post construction using visual surveys and/or wildlife cameras to determine if a relocated nest has returned to use. A monitoring report should be submitted to CDFW to document use or non/use of relocated nests.

<u>In non-natural areas such as structures, abandoned vehicles, human debris piles or other areas:</u>

In some District locations, woodrats have colonized abandoned buildings, old vehicles, diffuse garbage piles, or other locations where nests are difficult to locate, individuals cannot be live-trapped consistently, and/or there is a lack of woody materials for nest reconstruction. In these instances, live trapping is not required (especially if there is a risk to human health) if the surrounding area provides suitable habitat or supports a healthy colony that is being avoided and/or can be enhanced. Work at these locations must occur prior to April and after mid July to prevent impacts to woodrats rearing young.

In these types of projects (cleanup, demolitions etc.) if individual rats are present, they will be encouraged to leave the area on their own which may include demolition or cleanup in phases, and/or hand removal of materials. If individual woodrats are observed during implementation, work in the immediate area shall cease until the animal leaves the area on its own. Work may continue at other locations away from the observation location. If the animal does not leave the area on its own, the project biologist or a biological monitor shall be notified. Work may proceed at the observation site, once the animal has left the area on its own or a biological monitor is present to ensure that the individual SFDFWs are not harmed.

If nests are present that cannot be trapped or removed, woody debris piles that look like woodrat houses can be constructed to provide opportunities for sheltering and colonization by displaced woodrats. Woody debris piles shall be constructed under the guidance of the project biologist or onsite biological monitor. Woody debris piles will consist of dead branches of various sizes that are collected from the surrounding area. Each pile will generally be ~3-5 feet high by 8-10 feet in diameter. A variety of stem sizes shall be used ranging from ~0.5 to 6 inches in diameter. The intent is to provide a relatively safe location for an SFDFW to build a house with respect to predators, and to provide some amount of accessible woody material to facilitate colonization.

Nest replacement ratios will be determined based on the number of woodrats and/or nests observed, as well as the size and number of undisturbed nests in the surrounding areas.

Appendix 3.0-2g Bat BMPs

Best Management Practices for Avoiding and Minimizing Impacts to Bat Species

- In areas of suitable habitat, preconstruction surveys are required for the following bat species:
    - Pallid Bat (*Antrozous pallidus*)
    - Townsend's Big-eared Bat (*Corynorhinus townsendii*)
    - Western Red Bat (*Lasiurus blossevillii*)
    - Western Mastiff Bat (*Eumops perotis californicus*)

- Bat surveys should take place during the April 15 through August 31 maternity roost season whenever possible. Surveys may also take place between February 16 and April 14, or between September 1 and November 15. Findings during spring and fall surveys may indicate that a second summer survey is necessary
- Bats generally breed April through Aug, no building or tree work (over 16" dbh) is allowable during this time if surveys determine that special status bats or maternity roosts are present
- Bats may go into a deep torpor period November 16 through February 15, no building or tree work (over 16" dbh) is allowable during this time if surveys determine that special status bats or hibernaculum roosts are present
- If individual non breeding and non-special status bats are present, a qualified biologist may be retained to remove the bats and work may proceed year round
- If maternity roosting or special status bat species are present at any time, no work is allowed without first excluding and providing alternate roost site(s), or identifying suitable nearby existing roosting sites, outside of the breeding season
- Alternate roost site(s) must be determined by District Natural Resources staff or a consulting biologist and submitted to California Department of Fish and Wildlife before installation
- Whenever possible alternative roost site(s) will be provided 6 months to 1 year prior to the removal of maternity roosting habitat to allow bats adequate time to discover the new locations
- Alternative roost site(s) shall be monitored for occupancy by a qualified biologist within one year of installation
- Contractors, Midpen staff, and others working in areas known to support maternity roost site(s) and/or special status bat species will be provided biological awareness training by a qualified biologist prior to the commencement of work

Mitigation for impacts to maternity roost(s) and special status bat species:

<u>Buildings and other human structures:</u>

- To mitigate for demolition activities, fumigation, or other activities that involve the removal or disturbance of roosting bats in buildings, bridges, outbuildings, dilapidated structures, old vehicles (buses, trailers etc.), or other human created structures (including debris piles):

- If signs of bats are evident and removal or disturbance of bats is necessary, a qualified biologist will conduct surveys for roosting bats prior to beginning work. Surveys will consist of daytime pedestrian surveys to look for visual signs of bats (e.g., guano), and if determined necessary, evening emergence surveys to note the presence or absence of bats. If evidence of bat roosting is found, the number and species of roosting bats will be determined. If congregations of more than five bats are found within a single human-made structure during the maternity roosting

season it may be assumed that the colony constitutes a maternity roost and the location will be recorded in the District's wildlife database. If no evidence of bat roosts is found, then no further study will be required. Bat detectors and/or infrared detectors may be used to supplement survey efforts, but are not required.

- When bat roosting sites are located in buildings, exclusion of bats from the building will occur outside of the April through August nursery season.

- If roosts of special-status bats are determined to be present and must be removed, a bat exclusion plan will be prepared and submitted to CDFW. The exclusion plan will describe the method of exclusion, which may include the use of one-way doors at roost entrances (bats may leave but not re-enter), or sealing roost entrances when the site can be confirmed by a bat expert to contain no bats. No bats will be excluded until the plan is approved by CDFW and alternative roosting habitat is approved. The bats will be excluded from the roosting site before the site is disturbed or modified in any way.

Tree Removal:

- Avoid removal of trees greater than sixteen inches dbh during the April through August nursery season whenever possible.

- If removal of trees greater than sixteen inches dbh during the nursery season cannot be avoided, a qualified biologist will conduct surveys for roosting bats where suitable large trees are to be removed. Surveys will consist of daytime pedestrian surveys to look for visual signs of bats (e.g., guano), and if determined necessary, evening emergence surveys to note the presence or absence of bats. If evidence of roosting bats is found, the number and species of roosting bats will be determined. If no evidence of bat roosts is found, then no further study will be required. Bat detectors and/or infrared detectors may be used to supplement survey efforts, but are not required.

- If roosts of special-status bats are determined to be present and must be removed during the April through August nursery season, a bat exclusion plan shall be prepared and submitted to CDFW. The exclusion plan will describe the method of exclusion, which may include the use of one-way doors at roost entrances (bats may leave but not re-enter), or sealing roost entrances when the site can be confirmed by a bat expert to contain no bats. The use of sonic bat deterrents may also be allowed when called for by a qualified biologist. No bats will be excluded until the plan is approved by CDFW and alternative roosting habitat is approved. Exclusion efforts may be restricted during periods of sensitive activity (e.g., during hibernation or while females in maternity colonies are nursing young). The bats will be excluded from the roosting site before the site is disturbed, closed or modified in any way. When possible alternative roosting sites will be provided 6 months to a year prior to the removal of existing roosts. Once the replacement roosts are constructed and it is confirmed that bats are not present in the original roost site, the structures may be removed or sealed.

Work in or adjacent to areas known to support special status bats and/or maternity roosts:

- Whenever possible work shall take place outside of the April through August nursing season.
- Natural Resources staff shall provide and/or consult with qualified biologists having knowledge specific to the bat species present at the site. Species specific noise tolerance levels (including

high frequency noise) shall be established for work taking place within a determined buffer around the maternity roost. All equipment working within the site during the nursing season must be tested for high frequency noise outputs prior to use on the site. If equipment is determined to produce any noise that is expected to cause bats to abandon a maternity roost it will not be used on the site within the biologist established buffer during the nursing season.

Relocation of bat boxes:

- Relocation requires the approval of the Natural Resources department and may be performed by a qualified biologist.
- Bat boxes may be relocated between mid-September to mid-October, or from mid-February to mid-March (during warm periods outside of the nursing season). Bat boxes may be relocated outside of these recommended time periods with sign off from a qualified biologist.
- Relocation of boxes that support special status bat species requires notification to CDFW before implementation.
- If a bat box is determined to be unoccupied by a qualified biologist, it may be relocated at any time without modification. If occupied, a one way door shall be installed on the entrance/exit of the bat box, preferably during a warm period when bats are likely to be active. The one way door shall remain in place for a period of 3-7 days. After this period a qualified biologist shall arrive on site and check the box for occupancy. If the box is still occupied then the one way door shall remain in place for an additional 3-7 days. Once the box is determined to be unoccupied then it may be relocated with direction from Natural Resources or a qualified biologist to a nearby suitable habitat. The new location will be recorded and added to the Districts' GIS database. The one way door shall then be removed to allow bats to access the box. Relocated bat boxes shall be monitored for occupancy by a qualified biologist within one year of installation.

APPENDIX 4.3 AIR QUALITY MODELING ASSUMPTIONS AND CALCULATIONS

Appendix 4.3a Air Quality Modeling Assumptions

Appendix 4.3b Air Quality Calculations

Appendix 4.3a Air Quality Modeling Assumptions

Emission Factors and Burn Assumptions

Pollutant emissions will be estimated based on the emission factors developed in the California Air Resources Board's (CARB's) EMission FACtors 2017 (EMFAC2017) model, CARB's OFFROAD model, and United States Environmental Protection Agency (USEPA) AP-42 Compilation of Air Pollutant Emission Factors methodologies. Vehicle emission factors (including running exhaust, brake wear, and tire wear emissions) were derived based on modeling results from the EMFAC2017 model.[1] Offroad equipment emission factors (such as backhoes, Fugitive dust emissions from vehicles traveling unpaved roads and drip torch burning were estimated based on the USEPA AP-42 methodologies.

Emission factors were determined from the following estimation models:

- California Air Resources Board's (CARB) EMFAC[2]emissions inventory model. EMFAC is the latest emission inventory model that calculates emission inventories and emission rates for motor vehicles operating on roads in California. This model reflects CARB's current understanding of how vehicles travel and how much they emit. EMFAC can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.
- CARB OFFROAD[3] emissions inventory model. OFFROAD is the latest emission inventory model that calculates emission inventories and emission rates for off-road equipment such as loaders, excavators, and off-road haul trucks operating in California. This model reflects CARB's current understanding of how equipment operates and how much they emit. OFFROAD can be used to show how California off-road equipment emissions have changed over time and are projected to change in the future.
- USEPA AP-42, Compilation of Air Pollutant Emission Factors, has been published since 1972 as the primary compilation of USEPA's emission factor information. It contains emission factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emission factors have been developed and compiled from source test data, material balance studies, and engineering estimates.[4]

On-Road Vehicles

[1] On September 27, 2019, the USEPA and the National Highway Traffic Safety Administration (NHTSA) published the "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program." (84 Fed. Reg. 51,310 (Sept. 27, 2019) The Part One Rule revokes California's authority to set its own greenhouse gas emissions standards and set zero-emission vehicle mandates in California. CARB have estimated the vehicle tailpipe and evaporative emissions impacts from the SAFE Vehicles Rule Part One: One National Program. The SAFE Vehicle Rule Part One impacts some of the underlying assumptions in the EMFAC2017 model. Model adjustment factors were applied to adjust emission factors to account for the impacts of this rule. EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One, November 20, 2020, https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf and EMFAC Off-Model Adjustment Factors for Carbon Dioxide (CO2) Emissions to Account for the SAFE Vehicles Rule Part One and the Final SAFE Rule, June 26, 2020, https://ww3.arb.ca.gov/msei/emfac_off_model_co2_adjustment_factors_06262020-final.pdf?utm_medium=email&utm_source=govdelivery

[2] California Air Resources Board, EMFAC2017 User's Guide, March 1, 2018, https://ww3.arb.ca.gov/msei/downloads/emfac2017-volume-i-users-guide.pdf and https://www.arb.ca.gov/emfac/2017/

[3] California Air Resources Board, OFFROAD Instructions, http://www.arb.ca.gov/msprog/ordiesel/info_1085/oei_write_up.pdf

[4] US Environmental Protection Agency, AP 42, Compilation of Air Pollutant Emission Factors, Fifth Edition, Volume I Chapter 3: Stationary Internal Combustion Source, https://www3.epa.gov/ttn/chief/ap42/ch03/index.html

Vehicular emissions were computed using the CARB's emission factor model, EMFAC2017, to estimate on-road emissions. Vehicle trips were modeled using the light-duty auto, light-duty truck, motorcycle (designated for ATV), T6 heavy (designated for fire engine), and T6 small (designated for water truck) classifications. Paved road dust, break wear, and tire wear particulate emissions were also accounted for and included in the analysis using EMFAC2017 factors. Vehicles speeds and fuel type were based on an aggregate sample within EMFAC2017.

Pollutant emissions associated with on-road vehicles will then be calculated by combining the activity information with running emissions factors, in grams per mile, derived using the EMFAC2017. Emissions calculations were based on **Equation 1**. The EMFAC2017 running emissions factors are summarized on **Table 1**.

Equation 1

*Running Emission Rate (tons/year) = EMFAC Emission Factor (gram/mile) * trips per day * miles per trip * days/year * (453.59/2000 tons/gram)*

Table 1: On-Road Vehicle Running Emission Factors (gram/mile)

Vehicle Type	ROG	CO	NOx	CO_2	PM_{10}	$PM_{2.5}$	SO_2
Water Truck/Water Tender	0.19	0.57	2.93	1,217.72	0.20	0.12	0.01
ATV	2.34	20.32	1.17	216.15	0.02	0.01	<0.01
Truck	0.02	0.86	0.08	322.77	0.05	0.02	<0.01
Fire Engine	0.11	0.84	0.98	806.38	0.10	0.05	0.01
Heavy Truck	0.16	0.42	3.34	1,220.91	0.19	0.10	0.01

Source: CARB EMFAC2017 Emissions Model.
CO = carbon monoxide; NO_X = oxides of nitrogen; PM10 = particulate matter with diameter equal to or less than 10 micrometers; PM2.5 = particulate matter with diameter equal to or less than 2.5 micrometers; ROG = reactive organic gas; CO_2 = carbon dioxide

Pollutant emissions associated with on-road vehicles will then be calculated by combining the activity information with idling emissions factors, in grams per vehicle per day, derived using the EMFAC2017. Emissions calculations were based on **Equation 2**. EMFAC2017 idling emissions factors are summarized on **Table 2**.

Equation 2

*Idling Emission Rate (tons/year) = EMFAC Emission Factor (gram/vehicle/day) * vehicle/day * days/year * (453.59/2000 tons/gram)*

Table 2: On-Road Vehicle Idling Emission Factors (gram/vehicle/day)

Vehicle Type	ROG	CO	NOx	CO_2	PM_{10}	$PM_{2.5}$	SO_2
Water Truck/Water Tender	0.08	2.04	5.03	646.45	0.01	0.01	0.01
Fire Engine	0.29	2.43	1.00	139.03	0.01	0.01	<0.01
Heavy Truck	0.06	1.91	3.81	641.92	<0.01	<0.01	0.01

Source: CARB EMFAC2017 Emissions Model.
CO = carbon monoxide; NO_X = oxides of nitrogen; PM10 = particulate matter with diameter equal to or less than 10 micrometers; PM2.5 = particulate matter with diameter equal to or less than 2.5 micrometers; ROG = reactive organic gas; CO_2 = carbon dioxide

Off-Road Equipment

The project would require the use of off-road equipment, such as backhoe, chainsaws, excavators, skid loaders, and tractors. Emission factors from the CARB's OFFROAD2017 model will be used. Emission factors were determined based on the off-road equipment type, fuel type, and horsepower. This information will then be applied to pollutant emissions factors, in grams per horsepower-hour. **Equation 3** outlines how off-road construction equipment emissions will be computed, and the emissions factors used are summarized, by equipment type within **Table 3**. Emisson factors were adjusted based on the USEPA's *A Comprehensive Analysis of Biodiesel Impacts on Exhaust Emissions* (dated October 2002) to account for the use of R99 blend (99 percent renewable, 1 pecent conventional) produced by ConocoPhillips.

Equation 3

*Emission Rate (tons/year) = OFFROAD Emission Factor (gram/hp-hour) * size (hp) * hours of operation * (453.59/2000 tons/gram)*

Table 3: Off-Road Equipment Emissions Factors (g/hp-hour)

Equipment Type	HP	ROG	CO	NOx	CO_2	PM_{10}	$PM_{2.5}$	SO_2
Skid steer	71	0.02	0.63	0.88	194.53	0.02	0.01	<0.01
Backhoe	83	0.03	0.67	1.03	195.21	0.03	0.02	<0.01
Excavator	146	0.02	0.61	0.71	201.64	0.02	0.02	<0.01
Tractor	18	0.13	0.97	3.29	397.80	0.06	0.06	0.01
String trimmer	67	0.08	5.38	0.87	431.38	0.02	0.01	<0.01
Chainsaw	10	1.54	110.42	4.19	334.94	1.31	0.99	0.01

Power pole saw	10	1.54	110.42	4.19	334.94	1.31	0.99	0.01
Chipper	67	0.08	5.38	0.87	431.38	0.02	0.01	<0.01
Leaf blower	9	1.12	68.52	2.54	214.70	0.69	0.52	0.01
Generator	143	0.02	0.52	0.44	157.97	0.01	0.01	<0.01
Crane	74	0.14	9.14	1.30	364.42	0.01	0.01	<0.01

Source: CARB OFFROAD2017 Emissions Model.
CO = carbon monoxide; NO_X = oxides of nitrogen; PM10 = particulate matter with diameter equal to or less than 10 micrometers; PM2.5 = particulate matter with diameter equal to or less than 2.5 micrometers; ROG = reactive organic gas; CO_2 = carbon dioxide

Propane Flaming

Propane flaming mayalso be conducted to remove weeds. Propane flaming ("green flaming") uses a propane torch attached to a cylinder to heat seedling or annual plants until their cells burst and wilting occurs, but not to the point of ignition. Propane flamers come in hand-held models as well as on ATV mounts. The ignition source emissions factors are summarized on **Table 3**.

Table 3: Ignition Source Emissions Factors (lb/1000 gallons)

Equipment Type	ROG	CO	NOx	CO_2	PM_{10}	$PM_{2.5}$	SO_2
Propane Torch	1.00	7.50	13.00	12,500.00	0.70	0.70	<0.01

Source: USEPA AP-42 Compilation of Air Pollutant Emission Factors.

Prescribed Burning

Prescribed burning is a specific technique in which fire is applied to most or all of a well-defined area with discrete boundaries for the combined purpose of fuel load reduction and habitat improvement. The burn event is an activity when fire is intentionally applied at one or more ignition points and allowed to run between control lines across the designated unit. Ignitions are achieved using drip torches with a 1:4 mix of gasoline and diesel. Fire apparatus on-site would include multiple Type III fire engines and one or more water tenders to provide control and on-scene safety. The drip torch emissions factors are summarized on **Table 4**.

Table 4: Ignition Source Emissions Factors (lb/1000 gallons)

Equipment Type	ROG	CO	NOx	CO_2	PM_{10}	$PM_{2.5}$	SO_2
Drip Torch	107.19	123.88	469.89	20,786.62	32.51	32.51	30.08

Source: USEPA AP-42 Compilation of Air Pollutant Emission Factors.

The analysis of smoke emissions from prescribed fire was conducted using the First Order Fire Effects Model (FOFME6). This USDA Forest Service program was developed to predict smoke production from wildland fires, along with effects to soils and tree mortality from fires.

The model determines the regulated emissions of PM2.5, PM10, CO, CO2, NOX as well as CNH4 based on fuel volume of the vegetation burned and the moisture of the fuels when burned. FOFEM does not include a method for calculating ROG emissions. Applicable ROG emissions factors were used to estimate emissions from prescribed burning in various vegetation types[5,6].

Fuel volumes were determined by categorizing the life forms provided into those for which fuel volumes were available in the FOFEM6 model. This resulted in three different FOFEM Vegetation Types: SRM 906 - Broadleaf Forest, SRM 215 Valley Grassland (Annual grassland), and SRM 206 - Chamise Chaparral, from Shiftlet, 1994, (https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1044255.pdf).

The moisture of fuels plays greatly influences the amount of smoke produced, with more emissions being produced from wetter fuels (due to more incomplete combustion). Air quality impacts due to fire emissions are affected even more by environmental conditions than by the amount of fuel consumed (CAL FIRE 2013). The conditions of the analysis were conservative, assuming that the prescribed burns would occur under the highest moisture typically used. The inputs assumed a duff moisture of 40%, 10-hr fuel moisture of 10%, and a 1000-hr fuel of 15%.

FOFEM requires that the acres of each vegetation type be determined, since each vegetation type as a different set of emission factors. Inputs used the proportion of each vegetation type and air basin are shown in **Table 5.**

Table 5: Breakdown of Vegetation Types by Acre

Vegetation Type	Maximum Acres
Valley Annual Grasslands (60 percent of total)	270.0
Broadleaf Forest (30 percent of total)	135.0
Chamise Chaparral (10 percent of total)	45.0
SFBAAB Total	*450*
Valley Annual Grasslands (100 percent) NCCAB Total	*50*
Grand Total	**500**

All treatments are assumed to be a constant proportion of vegetation types throughout the life of Wildland Fire Resiliency Program even though it is there will be some variation in the vegetation types when treatments are applied in different locations at different times.

The justification for the proportion of vegetation types in the treatments, and resulting acres of each vegetation type, follows.

[5] USEPA. (1996, October). 13.1 Wildfires and Prescribed Burning.

[6] CARB. (2020, June 17). *Preliminary Estimates of Fire Emissions, 2000-2019*. Retrieved from https://ww2.arb.ca.gov/wildfire-emissions

Emissions varied greatly between the type of vegetation to be burned. Vegetation types with a deep duff layer generally produce more emissions of all types. Grass and shrubby vegetation types with little building up of fuels do not produce large quantities of emissions. The table below indicates the relative contribution to emissions. In almost every case, forests produced the most emissions, and grass the least.

In forest types, approximately 90 percent of emissions are produced during the smoldering phase of combustion, for all types of monitored emissions with the exception for NOX. In shrub types a majority of emissions occur during smoldering for PM10, PM 2.5 and CH4 and CO2, but it comprises less than 20% of emissions of NOX, CO and SO2. Because almost all fuels are consumed in the flaming front of grassfires, smoldering contributed nearly nothing to emissions.

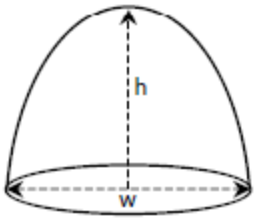
In every treatment, the volume CO2 were the highest of all types of emissions. This is true for all types of prescribed burning, whether it is from pile burning or Prescribed burning, and regardless of vegetation types involved.

Total emissions were the highest for Hardwood Forests, and the lowest for Annual Grass. The greatest amount of all emissions is produced during the smoldering stage, with the exception of grass, which does not tend to smolder.

Pile Burning

Predicted emissions from piles of dry vegetation were calculated using "Consume" software, an industry standard for estimating the amounts of particulates, carbon dioxide, carbon monoxide, methane, and non-methane hydrocarbons (NMHC). In comparison to predicted emissions using FOFEM, Consume does not include NOx or SOx as outputs, but includes the non-methane hydrocarbons. Non-methane hydrocarbons are key to producing ozone (O_3) in atmosphere which can significantly affect the atmospheric photochemical chemistry and human health. Applicable NOx and SOx emission factors were used to estimate emissions from pile burning[7].

Piles were categorized as hardwood/shrub, and were comprised of cut, dried and piled forest slash and debris from oak and tanoak or shrubs. The analysis assumed 90 percent of the piles were burned assuming that all piles were uniform in dimensions and volume. The dimensions of all piles were permitted to be 6 feet high and 10 feet wide, shaped in a parabola.



Parabolic shape of piles

[7] Urbanski, S. (2014). Wildland fire emissions, carbon and climate: Emission factors. *Forest Ecology and Management*, 51-60.

Appendix 4.3b Air Quality Calculations

			Existing Treatments			Potential Treatments		
Units	**VMA/ Activity**	**Create New or Maintain Existing**	**SFBAAB**	**NCCAB**	**Total**	**SFBAAB Maximum**	**NCCAB Maximum (Based on VMA Treatments)**	**Total Maximum**
Acres	Shaded Fuelbreaks	New				50.00		50.00
		Maintain	202.97	7.03	210.00	96.65	3.35	100.00
	Non-Shaded Fuelbreaks	New				5.00		5.00
		Maintain	75.20		75.20	80.00		80.00
	Evacuation Routes, Critical Infrastructure, Fire Management Logistics Fuelbreaks	New				383.80	16.20	400.00
		Maintain				383.80	16.20	400.00
	Target Hazards Fuelbreaks	New				19.97	0.03	20.00
		Maintain				19.97	0.03	20.00
	Fire Agency New Recommended Fuelbreaks	New				100.00		100.00
		Maintain						
	Ingress/Egress Route Fuelbreaks	New				25.00		25.00
		Maintain	9.10		9.10	25.00		25.00
	Disclines	New				10.00		10.00
		Maintain	61.50		61.50	60.00		60.00
	Midpen Structures and Facilities Defensible Space	New						
		Maintain	115.51	0.09	115.60	174.86	0.14	175.00
	Emergency Staging Areas, Emergency Landing Zones, and Other Fire Management Logistics Areas	New				95.81	4.19	100.00
		Maintain	32.13	1.17	33.30	28.95	1.05	30.00
	Eucalyptus and Acacia Removal	New				20.00		20.00
		Maintain				10.00		10.00
	Fuel Reduction Areas	New				486.39	13.61	500.00
		Maintain				486.39	13.61	500.00
	Total	**New**				**1195.98**	**34.02**	**1230.00**
	Total	**Maintain**	**496.41**	**8.29**	**504.70**	**1365.62**	**34.38**	**1400.00**
Tons	Pile Burning	New	1.00		1.00	475.00	25.00	500.00
Acres	Prescribed Burning	New				450.00	50.00	500.00
Acres	Construction	New				6.70		6.70

Note: NCCAB Maximum Potential Treatments are determined from the percent that the total area of VMAs in NCCAB compared to the overall area of VMAs.

Baseline pile burn data was converted from 24 cubic yards of shrub/broom to tons. https://depts.washington.edu/nwfire/piles/

VMA	Primary Mechanical Methods	Ratio Per Method
Shaded Fuelbreaks	Cutting	0.7
	Pulling	0.1
	Masticating	0.2
Non-Shaded Fuelbreaks	Mowing	0.7
	Masticating	0.2
	Cutting	0.1
Evacuation Routes, Critical Infrastructure, Fire Management Logistics	Mowing	0.2
	Masticating	0.5
	Cutting	0.3
Target Hazards Fuelbreaks	Mowing	0.3
	Masticating	0.2
	Cutting	0.5
Fire Agency New Recommended Fuelbreaks	Mowing	0.1
	Masticating	0.4
	Cutting	0.5
	Mowing	0.5

Ingress/Egress Route	Masticating	0.3
Fuelbreaks	Cutting	0.2
	Discing	0.9
Disclines	Cutting	0.1
	Mowing	0.3
Midpen Structures and	Masticating	0.2
Facilities Defensible Space	Cutting	0.5
Emergency Staging Areas,	Mowing	0.3
Emergency Landing Zones,	Masticating	0.5
and Other Fire Management	Cutting	0.2
	Cutting	0.8
Eucalyptus and Acacia	Masticating	0.1
Removal	Pulling	0.1
	Cutting	0.7
	Masticating	0.2
Fuel Reduction Areas	Mowing	0.1

Notes: Non-power techniques are not considered as no emissions are generated; Pile burning, prescribed herbivory, and chemical use is in addition to manual and mechanical powered techniques.

Ratios of each method were determined through professional experience of SIG and Prometheus Fire Consulting, as well as taking into account types of vegetation communities present in each overall VMA area.

Average Daily SFBAAB Existing Treatment							
Type	**Method**		**Crew Size (Average)**	**Maximum Acres**	**Days/Year**	**Acres/Day**	
Manual and Mechanical	Masticating	Maintain	5	97.5	17	6	
	Mowing	Maintain	5	101.5	17	6	
	Cutting	Maintain	5	221.8	56	4	
	Discing	Maintain	5	55.4	7	8	
	Pulling	Maintain	5	20.3	21	1	
	Chipping	50 percent cutting	Refer to Cutting	NA	27.71875	NA	
	Pile Burning	New	15	NA	1	14	(Tons/Day)
	Flaming	1 percent of total	2	5.0	3	2	
Chemical	Glyphosate Round-up Promax; Clethodim; Aminopyralid; Clopyralid; Imazapyr; Triclopyr BEE/TEA	Maintain (10 percent of total)	8	49.6	25	2	
		Total Worker days	**811**	**Total Workdays**	**147**		
		Average Workers	**6**				

Note: Ten 6-foot piles of hardwood/shrub is about 4 tons if hand piled. MidPen could burn anywhere from 20 - 50 piles in a day; average 35 piles (Phil Dye 2020)

Maximum Daily NCCAB Existing Treatment					Annual NCCAB Existing Treatment			
Type	**Method**		**Crew Size (Maximum)**	**Acres/Day**	**Crew Size (Average)**	**Maximum Acres**	**Days/Year**	**Acres/Day**
Manual and Mechanical	Masticating	Maintain	10	6	5	2.0	1	6
	Mowing	Maintain	10	6	5	0.4	1	6
	Cutting	Maintain	10	4	5	5.2	2	4
	Discing	Maintain	NA	NA	NA	NA	NA	NA
	Pulling	Maintain	10	1	5	0.7	1	1
	Chipping	50 percent cutting	Refer to Cutting	NA	Refer to Cutting	NA	0.65	NA
	Flaming	1 percent of total	4	1	2	0.1	1	0.5
Chemical	Glyphosate Round-up Promax; Clethodim; Aminopyralid; Clopyralid; Imazapyr; Triclopyr BEE/TEA	Maintain (10 percent of total)	15	2	8	0.8	1	2
		Peak Day	**55**					
		Total Worker days			**35**	**Total Workdays**	**7**	
		Average Workers			**5**			

Note: No disclines occur in NCCAB.

Flaming could occur December through March, and as such would not occur at the same time as the other treatments. The other activities highlighted in purple would constitute a second possible peak day.

If the maximum acres was less than the possible acres per day that could be achieved, then the acres per day was reduced accordingly

Average Daily SFBAAB Potential Program Activities						
Type	**Method**		**Crew Size (Average)**	**Maximum Acres**	**Days/Year**	**Acres/Day**
Manual and Mechanical	Masticating (FRA)	New	5	97.3	17	6
		Maintain	5	97.3	9	12

	Masticating	New	5	304.3	102	3	
		Maintain	5	289.2	49	6	
	Mowing (FRA)	New	5	48.6	9	6	
		Maintain	5	48.6	5	12	
	Mowing	New	5	137.5	46	3	
		Maintain	5	212.4	36	6	
	Cutting (FRA)	New	5	340.5	86	4	
		Maintain	5	340.5	43	8	
	Cutting	New	5	251.8	126	2	
		Maintain	5	313.0	79	4	
	Discing	New	5	9.0	3	3	
		Maintain	5	54.0	7	8	
	Pulling	New	5	7.0	14	0.5	
		Maintain	5	10.7	11	1	
	Chipping	50 percent cutting	Refer to Cutting	NA	165.9	NA	
	Pile Burning	New (95 percent of total)	15	NA	34	14	(Tons/Day)
	Flaming	1 percent of total	2	25.6	13	2	
Chemical	Glyphosate Round-up Promax; Clethodim; Aminopyralid;	New (10 percent of total)	8	119.6	240	0.5	
		Maintain (10 percent of total)	8	136.6	69	2	
Prescribed Herbivory	Livestock	Pre-Treatment (95 percent of 100 acres)	4	95.0	48	2	
Burning	Prescribed Burning	New	50	450.0	14	NA	
		Grasslands (60 percent of total)	50	270.0	5.4	50	
		Woodlands (30 percent of total)	50	135.0	5.4	25	
		Shrublands (10 percent of total)	50	45.0	3	15	
	Pre-Treatment	New	25	18.5	20	NA	
		grasslands (1 percent)	25	2.7	5.4	0.5	
		woodlands (10 percent)	25	13.5	10.8	1.25	
		Shrublands (5 percent)	25	2.3	3	0.75	
	Mop Up	New	25	10.8	14	NA	
		grasslands (1 percent)	25	2.7	5.4	0.5	
		woodlands (5 percent)	25	6.8	5.4	1.25	
		Shrublands (3 percent)	25	1.4	3	0.45	
Construction and Installation		New (0.2-acre 1 water storage tank and associated water infrastructure; 1 5-acre staging/landing zone; 1 mile of spur raod)	5	6.7	28	NA	
		Total Worker days	**8100**	**Total Workdays**	**1122**		
		Average Workers	**7**				

Notes: 50 acres of prescribed burn at MBARD removed from total 500 acres of prescribed burn possible.

Chipping crew is included in cutting. Days of work are half as long as cutting.

On average for grassland, pre-treatment occurs for 1 day, the burn occurs for 1 day, and mop up occurs for 1 day. For understory, 2 to 3 days of pre-treatment, 1 day for burn, and 1 to 2 days for mop up. (Phil Dye 2020)

Prescribed burning per day in grasslands, could cover 20 - 100 acres; for woodland, 10 - 50 acres; for shrublands 5 to 25, average 15 acres (Phil Dye 2020)

No new firefighting infrastructure is assumed to be installed in Long Ridge/MBARD based on current understanding of needs.

Maintenance would be less intense than creation, which is accounted for in the acres per day.

Creation and maintenance of Fuel Reduction Areas would be 50% less intense than typical creation/maintenance, which is accounted for in the acres per day.

Ten 6-foot piles of hardwood/shrub is about 4 tons if hand piled. MidPen could burn anywhere from 20 - 50 piles in a day; average 35 piles (Phil Dye 2020)

Maximum Daily NCCAB Potential Program Activities					**Annual NCCAB Potential Program Activities**			
Type	**Method**		**Crew Size (Maximum)**	**Acres Per Day**	**Crew Size (Average)**	**Maximum Acres**	**Days/Year**	**Acres/Day**
Manual and Mechanical	Masticating (FRA)	New	10	6	5	2.7	1	6
		Maintain	10	12	5	2.7	1	12
	Masticating	New	10	3	5	10.2	4	3
		Maintain	10	6	5	9.3	2	6
	Mowing (FRA)	New	10	6	5	1.4	1	6
		Maintain	10	12	5	1.4	1	12
	Mowing	New	10	3	5	4.5	2	3
		Maintain	10	6	5	3.6	1	6
	Cutting (FRA)	New	10	4	5	9.5	3	4
		Maintain	10	8	5	9.5	2	8
	Cutting	New	10	2	5	5.7	3	2
		Maintain	10	4	5	7.5	2	4
	Discing	New	NA	NA	NA	NA	NA	NA
		Maintain	NA	NA	NA	NA	NA	NA
	Pulling	New	10	0.5	5	0.0	0	0.5
		Maintain	10	1.0	5	0.3	1	1

	Chipping	50 percent cutting	Refer to Cutting	NA	Refer to Cutting	NA	4.2	NA	
	Pile Burning	New (5 percent of total)	50	14	15	NA	2	14	(Tons/Day)
	Flaming	1 percent of total	4	2	2	0.7	1	2	
Chemical	Glyphosate Round-up Promax;	New (10 percent of total)	15	0.5	8	3.4	7	0.5	
	Clethodim; Aminopyralid;	Maintain (10 percent of total)	15	2	8	3.4	2	2	
Prescribed Herbivory	Livestock	Pre-Treatment (5 percent of 100 acres)	8	2	4	5.0	3	2	
Burning	Prescribed Burning	New (Grasslands only)	100	50	50	50.0	1	50	
	Pre-Treatment	New (5 percent of total burn area)	25	2.5	25	2.5	1	2.5	
	Mop Up	New (5 percent of total burn area)	25	2.5	25	2.5	1	2.5	
		Peak Day 1 Total	**100**						
		Peak Day 2 Total	**50**						
		Peak Day 3 Total	**55**						
		Total Worker days			**296**	**Total Workdays**	**42.0**		
		Average Workers			**7**				

Note: No disclines could be treated in NCCAB.

Flaming could occur December through March, and as such would not occur at the same time as the other treatments.

Prescribed burning would constitute one possible peak day (green). Pile burning would constitute a second possible peak day (blue). Creation activities that can occur simultaneously would constitute a third possible peak day (purple).

On average for grassland, pre-treatment occurs for 1 day, the burn occurs for 1 day, and mop up occurs for 1 day.

If the maximum acres was less than the possible acres per day that could be achieved, then the acres per day was reduced accordingly

A 50-acre burn was assumed in Long Ridge. No burn was assumed in southern Sierra Azul as this aread burned in the 2016 Loma Fire.

Type	Method	Equipment	Number of equipment	Treatment (hours/day)	Existing (hours/acre)	New (hours/acre)	Maintain (hours/acre)	One-way paved miles/day	One-way unpaved miles/day SFBAAB	One-way unpaved miles/day NCCAB
Manual and Mechanical	Masticating (FRA)	Skid steer	1	8	NA	1.3	0.9			
		Backhoe								
		Excavator								
		Tractor								
	Masticating	Skid steer	1	8	1.3	2.7	1.3			
		Backhoe								
		Excavator								
		Tractor								
	Mowing (FRA)	Skid steer								
		Backhoe								
		Excavator								
		String trimmer	1	8	NA	1.3	0.7			
		Tractor	1	6	NA	1.0	0.5			
	Mowing	Skid steer								
		Backhoe								
		Excavator								
		Tractor	1	8	1.3	2.7	1.3			
	Cutting (FRA)	Skid steer	1	8	NA	2.0	1.0			
		Tractor								
		Chainsaw	5	6	NA	1.5	0.8			
		Power pole saw	1	6	NA	1.5	0.8			
		Non-powered tools (pole pruner, jawz implement)								
	Cutting	Skid steer	1	8	2.0	4.0	2.0			
		Tractor								
		Chainsaw	4	6	1.5	3.0	1.5			
		Power pole saw	2	6	1.5	3.0	1.5			
		Non-powered tools (pole pruner, jawz implement)								
	Discing	Tractor with disc harrow	1	8	1.0	2.7	1.0			
	Pulling	Backhoe	1	4	4.0	8.0	4.0			
		Excavator	1	4	4.0	4.0	4.0			
		Non-powered tools								
	Chipping	Chipper (50 percent of cutting)	1	8	NA	NA	NA			
	Propane flaming	Propane torch (e)	1	8	4.0	4.0				
	Pile burning	Water truck (c)	1	10	NA	NA		16.4	6.4	2.6
		Leaf blower	1	10	NA	NA				
		drip torch (1.5 gallons each) (a)	4							
Chemical		ATV (c)	1					0.4	6.4	2.6
		Chainsaw	1	2	1.0	4.0	1.0			
		Power pole saw	1	2	1.0	4.0	1.0			
Prescribed herbivory		Generator (f)	1	8		NA	NA			
		Pickup Truck (c)	Refer to Vehicle Travel					Refer to Vehicle Travel	Refer to Vehicle Travel	Refer to Vehicle Travel
Prescribed burning	Burn	Fire engine (Wildland Type 3) (b)(c)	3	10		NA		16.4	6.4	2.6
		Fire engine (Wildland Type 6) (b)(c)	2	8		NA		16.4	6.4	2.6
		Water truck/tender (b)(c)	1	10		NA		16.4	6.4	2.6
		drip torch (1.5 gallons each) (a)	6							
	Pre-Treatment (Cutting)	Skid steer	1	8		NA				
		Tractor								
		Chainsaw	1	4		NA				
		Power pole saw	1	4		NA				
	Mop Up (Cutting)	Fire engine (Wildland Type 6) (b)(c)	2	8		NA		16.4	6.4	2.6
		Skid steer	1	8		NA				
		Tractor								
		Chainsaw	1	4		NA				
		Power pole saw	1	4		NA				
Vehicle Travel		Automobile (single occupancy to Midpen offices) (d)	Varies		NA	NA	NA	12.8	0.0	0.0
		Pickup truck/van (five-person occupancy; average to and from preserves to Midpen offices) (b)	Varies		NA	NA	NA	16.0	0.0	0.0
		Pickup truck/van (five-person occupancy; within preserves) (c)	Varies		NA	NA	NA	0.4	8.8	4.1
Installation of Infrastructure		Backhoe	1	8		NA				
		Excavator	1	8		NA				
		Skid steer	2	6		NA				
		Generator	1	8		NA				
		Crane	1	4		NA				
		Water truck (b)	1	2		NA		16.0	0.0	0.0
		Heavy truck (b)	1			NA		16.0	0.0	0.0

Note: (a) For drip torch use, one full torch can burn (1) About 10 piles (if dry) or 40 tons. (2) About 5 acres for a prescribed burn (Phil Dye 2020)

(b) Average distance from administrative field office to the OSPs. (GIS calc)

(c) Distance determined as average miles of internal road access (excluding trails for larger trucks) within each preserve/managed area. (GIS calc)

(d) Average one-way commuter distance in the bay area. (ABAG 2017)

(e) 4.24 pounds propane/gallon, 10 pounds per 1 hour (The Nature Conservancey 2001)

(f) For a 143 HP generator, 10.4 gallons of fuel per hour (Hardy Diesel 2020)

The renewable diesel Midpen uses is an R99 blend (99% renewable, 1% conventional) produced by ConocoPhillips. The feedstock is tallow.

Equipment	HP	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	CH4	N2O	Units
String trimmer	67	0.08	5.38	0.87	431.38	0.02	0.01	0.00			Emission Factor (g/hp-hr)
Chipper	67	0.08	5.38	0.87	431.38	0.02	0.01	0.00			Emission Factor (g/hp-hr)
Propane torch		1.00	7.50	13.00	12,500.00	0.70	0.70				Emission Factor (lb/10^3gal)
Leaf blower	9	1.12	68.52	2.54	214.70	0.69	0.52	0.01			Emission Factor (g/hp-hr)
drip torch		107.19	123.88	469.89	20,786.62	32.51	32.51	30.08			Emission Factor (lb/10^3gal)
ATV		2.34	20.32	1.17	216.15	0.02	0.01	0.00	0.34	0.07	Emission Factor (g/mile)
Fire engine (Wildland Type 3)		0.11	0.84	0.98	806.38	0.10	0.05	0.01	0.01	0.05	Emission Factor (g/mile)
Fire engine (Wildland Type 6)		0.11	0.84	0.98	806.38	0.10	0.05	0.01	0.01	0.05	Emission Factor (g/mile)
Tractor (with or without disc harrow)	18	0.13	0.97	3.29	397.80	0.06	0.06	0.01			Emission Factor (g/hp-hr)
Chainsaw	10	1.54	110.42	4.19	334.94	1.31	0.99	0.01			Emission Factor (g/hp-hr)
Power pole saw	10	1.54	110.42	4.19	334.94	1.31	0.99	0.01			Emission Factor (g/hp-hr)
Automobile		0.03	0.82	0.06	275.25	0.05	0.02	0.00	0.01	0.01	Emission Factor (g/mile)
Pickup truck/van		0.02	0.86	0.08	322.77	0.05	0.02	0.00	0.00	0.01	Emission Factor (g/mile)
Backhoe	83	0.03	0.67	1.03	195.21	0.03	0.02	0.00			Emission Factor (g/hp-hr)
Excavator	146	0.02	0.61	0.71	201.64	0.02	0.02	0.00			Emission Factor (g/hp-hr)
Skid steer	71	0.02	0.63	0.88	194.53	0.02	0.01	0.00			Emission Factor (g/hp-hr)
Generator	143	0.02	0.52	0.44	157.97	0.01	0.01	0.00			Emission Factor (g/hp-hr)
Crane	74	0.14	9.14	1.30	364.42	0.01	0.01	0.00			Emission Factor (g/hp-hr)
Water truck/tender		0.19	0.57	2.93	1,217.72	0.20	0.12	0.01	0.01	0.19	Emission Factor (g/mile)
Heavy truck		0.16	0.42	3.34	1,220.91	0.19	0.10	0.01	0.01	0.19	Emission Factor (g/mile)

	ROG	CO	NOx	CO2	PM10	PM2.5	SOx	CH4	N2O	
Water truck	0.08	2.04	5.03	646.45	0.01	0.01	0.01	0.00	0.10	Emission Factor (g/vehicle/day)
Water tender	0.08	2.04	5.03	646.45	0.01	0.01	0.01	0.00	0.10	Emission Factor (g/vehicle/day)
Fire engine (Wildland Type 3)	0.29	2.43	1.00	139.03	0.01	0.01	0.00	0.07	0.01	Emission Factor (g/vehicle/day)
Fire engine (Wildland Type 6)	0.29	2.43	1.00	139.03	0.01	0.01	0.00	0.07	0.01	Emission Factor (g/vehicle/day)
Heavy truck	0.06	1.91	3.81	641.92	0.00	0.00	0.01	0.00	0.10	Emission Factor (g/vehicle/day)

Activities	Uncontrolled Emission Factor PM10	Units	Controlled Emission Factor PM10	Units	Uncontrolled Emission Factor PM2.5	Units	Controlled Emission Factor PM2.5	Units	Source	Notes
Paved Roads - Passenger Vehicle/ATV/Mower Traffic	0.0028	lb/VMT			0.00068	lb/VMT			AP-42, Section 13.2.1 Paved Roads	With Precipitation
	0.0029	lb/VMT			0.00071	lb/VMT				Without Precipitation
Paved Roads - Medium Truck Traffic	0.008	lb/VMT			0.0020	lb/VMT			AP-42, Section 13.2.1 Paved Roads	With Precipitation
	0.0082	lb/VMT			0.0020	lb/VMT				Without Precipitation
Paved Roads - Fire/Water Truck Traffic	0.026	lb/VMT			0.0065	lb/VMT			AP-42, Section 13.2.1 Paved Roads	With Precipitation
	0.028	lb/VMT			0.0068	lb/VMT				Without Precipitation
Unpaved Roads - Passenger Vehicle/ATV/Mower Traffic	0.467	lb/VMT	0.353	lb/VMT	0.046	lb/VMT	0.035	lb/VMT	AP-42, Section 13.2.2 Unpaved Roads	With Precipitation
	0.576	lb/VMT			0.057	lb/VMT			CalEEMod User's Guide, November 2017	Without Precipitation
Unpaved Roads - Medium Truck Traffic	0.469	lb/VMT	0.287	lb/VMT	0.046	lb/VMT	0.028	lb/VMT	AP-42, Section 13.2.2 Unpaved Roads	With Precipitation
	0.469	lb/VMT			0.047	lb/VMT			CalEEMod User's Guide, November 2017	Without Precipitation
Unpaved Roads - Fire/Water Truck Traffic	0.300	lb/VMT	0.226	lb/VMT	0.030	lb/VMT	0.022	lb/VMT	AP-42, Section 13.2.2 Unpaved Roads	With Precipitation
	0.370	lb/VMT			0.037	lb/VMT			CalEEMod User's Guide, November 2017	Without Precipitation

Paved Roads Emission Factor Assumptions

0.0022	PM10 k Constant
0.00054	PM2.5 k Constant
1.8	ton Passenger Vehicle
5.0	ton Medium truck
17	ton Heavy truck (average full/empty)
0.7	silt content

Unpaved Roads Emission Factor Assumptions

1.8	PM10 k Constant
0.18	PM2.5 k Constant
1.8	ton Passenger Vehicle
5.0	ton Medium truck
17	ton Heavy truck (average full/empty)
4.3	silt content
0.5	moisture content
40	speed
15	speed
69	Days of Measurable Precipitation

Source: CalEEMod User's Guide, November 2017, page 39.

Vehicle speed control (BAAQMD Basic Emission Reduction Measures and Midpen requirement for vehicles to travel no more than 15 mph on unpaved, unposted roads

Results in Control Efficiency of about 39%

61.2%	61.0%	Unpaved Roads - Passenger Vehicle/ATV/Mower Traffic
61.2%	60.9%	Unpaved Roads - Medium Truck Traffic
61.2%	60.9%	Unpaved Roads - Fire/Water Truck Traffic

Driptorch Emission Factor Calculations

Diesel

Emission Factor (lb/10^3 gal)

CO	*ROG*	*NOx*	*SOx*	*TOTAL PM*	*CO2*
126.81	46.72115	588.6865	38.71181	41.38159	21892.2

Heating value (MMBtu/10^3 gal)

133.489

Gas

Emission Factor (lb/10^3 gal)

CO	*ROG*	*NOx*	*SOx*	*TOTAL PM*	*CO2*
117.04	248.2767	192.71	9.931068	11.8227	18206.96

Heating value (MMBtu/10^3 gal)

118.227

70 diesel/30 gas Mix

Emission Factor (lb/10^3 gal)

CO	*ROG*	*NOx*	*SOx*	*TOTAL PM*	*CO2*
123.88	107.1878	469.8935	30.07759	32.51392	20786.62

Heating value (MMBtu/10^3 gal)

118.227

Emssion factors obtained from USEPA 1996 AP-42

Mix of fuel (70/30) from Oaklahoma State University 2020

Heating value obtained from California Department of Energy 2014

G E I O L N J Q P

Existing Treatments

Emission Factors

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Light Duty Automobile	0.8243	0.0278	0.0586	0.0027	0.0461	0.0191	275.2545	0.0057	0.0052
Light Duty Auto on Paved Road					0.0029	0.0007			

Annual Emissions

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
miles/year									
20761.60	0.0189	0.0006	0.0013	0.0001	0.0011	0.0004	6.2994	0.0001	0.0001
					0.0301	0.0074			
	0.0189	**0.0006**	**0.0013**	**0.0001**	**0.0311**	**0.0078**	**6.2994**	**0.0001**	**0.0001**

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Unpaved Road					0.4695	0.0466			

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
miles/year											
2837.12	0.0027	0.0000	0.0002	0.0000	0.0001	0.0001	1.0094	0.0000	0.0000		
					0.6660	0.0662				0.4076	0.0403
	0.0027	**0.0000**	**0.0002**	**0.0000**	**0.6661**	**0.0662**	**1.0094**	**0.0000**	**0.0000**		

Note: Removed personnel who would arrive by water tender (pile burning)

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Paved Road					0.0082	0.0020			

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
miles/year									
5295.42	0.0050	0.0001	0.0005	0.0000	0.0003	0.0001	1.8841	0.0000	0.0000
					0.0217	0.0053			
	0.0050	**0.0001**	**0.0005**	**0.0000**	**0.0220**	**0.0054**	**1.8841**	**0.0000**	**0.0000**

Note: Removed personnel who would arrive by water tender (pile burning)

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Unpaved Road					0.3696	0.0367			

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
miles/year											
12.80	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0172	0.0000	0.0000		
					0.0024	0.0002				0.0014	0.0001
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0024**	**0.0002**	**0.0172**	**0.0000**	**0.0000**		

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Paved Road					0.0278	0.0068			

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
miles/year									
32.85	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0441	0.0000	0.0000
					0.0005	0.0001			
	0.0000	**0.0000**	**0.0001**	**0.0000**	**0.0005**	**0.0001**	**0.0441**	**0.0000**	**0.0000**

Vehicle Type	Emission Factors (g/vehicle/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	2.0424	0.0796	5.0303	0.0061	0.0145	0.0138	646.4472	0.1016	0.0037

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
days/year									
1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0007**	**0.0000**	**0.0000**

Vehicle Type	Emission Factors (g/vehicle/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type III Fire Engine Truck	2.4272	0.2872	1.0018	0.0013	0.0131	0.0126	139.0304	0.0131	0.0675

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
days/year									
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vehicle Type	Emission Factors (g/vehicle/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type VI Fire Truck	2.4272	0.2872	1.0018	0.0013	0.0131	0.0126	139.0304	0.0131	0.0675

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
days/year									
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Unpaved Road					0.5760	0.0573			

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
miles/year											
320.00	0.0072	0.0008	0.0004	0.0000	0.0000	0.0000	0.0762	0.0000	0.0001		
					0.0922	0.0092				0.0564	0.0056
	0.0072	**0.0008**	**0.0004**	**0.0000**	**0.0922**	**0.0092**	**0.0762**	**0.0000**	**0.0001**		

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Paved Road					0.0029	0.0007			

Unit	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
miles/year									
21.25	0.0005	0.0001	0.0000	0.0000	0.0000	0.0000	0.0051	0.0000	0.0000
					0.0000	0.0000			
	0.0005	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0051**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Generator	0.5247	0.0191	0.4421	0.0015	0.0101	0.0093	157.9734	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
143.18	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Chainsaw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
10.45	1380.14	1.7552	0.0244	0.0667	0.0001	0.0208	0.0157	5.3243	0.0000	0.0000
		1.7552	**0.0244**	**0.0667**	**0.0001**	**0.0208**	**0.0157**	**5.3243**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Chipper	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
67.00	221.75	0.0881	0.0013	0.0142	0.0001	0.0003	0.0002	7.0648	0.0000	0.0000
		0.0881	**0.0013**	**0.0142**	**0.0001**	**0.0003**	**0.0002**	**7.0648**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Skid Steer Loader	0.6255	0.0198	0.8807	0.0018	0.0155	0.0143	194.5350	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
70.56	573.54	0.0279	0.0009	0.0393	0.0001	0.0007	0.0006	8.6783	0.0000	0.0000
		0.0279	**0.0009**	**0.0393**	**0.0001**	**0.0007**	**0.0006**	**8.6783**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Tractor	0.9740	0.1295	3.2925	0.0054	0.0601	0.0553	397.8031	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
18.07	190.66	0.0037	0.0005	0.0125	0.0000	0.0002	0.0002	1.5111	0.0000	0.0000
		0.0037	**0.0005**	**0.0125**	**0.0000**	**0.0002**	**0.0002**	**1.5111**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Excavator	0.6109	0.0243	0.7104	0.0019	0.0166	0.0153	201.6426	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
146.03	81.19	0.0080	0.0003	0.0093	0.0000	0.0002	0.0002	2.6352	0.0000	0.0000
		0.0080	**0.0003**	**0.0093**	**0.0000**	**0.0002**	**0.0002**	**2.6352**	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Backhoe	0.6710	0.0300	1.0309	0.0018	0.0261	0.0240	195.2141	0.0000	0.0000

Horsepower	Unit hours/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
83.17	81.19	0.0050	0.0002	0.0077	0.0000	0.0002	0.0002	1.4530	0.0000	0.0000

											0.0050	**0.0002**	**0.0077**	**0.0000**	**0.0002**	**0.0002**	**1.4530**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)									Unit	Emissions (tons/year)									
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Crane	9.1355	0.1356	1.2963	0.0035	0.0135	0.0102	364.4179	0.0000	0.0000	74.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
												0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)									Unit	Emissions (tons/year)									
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
String Trimmer	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000	67.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
												0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)									Unit	Emissions (tons/year)									
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Power pole saw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000	10.45	714.89	0.9092	0.0126	0.0345	0.0001	0.0108	0.0081	2.7579	0.0000	0.0000
												0.9092	**0.0126**	**0.0345**	**0.0001**	**0.0108**	**0.0081**	**2.7579**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)									Unit	Emissions (tons/year)									
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Leaf blower	68.5165	1.1224	2.5378	0.0059	0.6918	0.5227	214.7015	0.0000	0.0000	9.39	10.00	0.0071	0.0001	0.0003	0.0000	0.0001	0.0001	0.0222	0.0000	0.0000
												0.0071	**0.0001**	**0.0003**	**0.0000**	**0.0001**	**0.0001**	**0.0222**	**0.0000**	**0.0000**

	Emission Factor ($lb/10^3$ gal)									Unit	Emissions (tons/year)									
Activity	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*gal/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	
Drip Torch (Prescribed Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	
											0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	

	Emission Factor ($lb/10^3$ gal)									Unit	Emissions (tons/year)									
Activity	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*gal/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	
Drip Torch (Pile Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000	0.53	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0055	0.0000	0.0000	
											0.0000	**0.0000**	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0055**	**0.0000**	**0.0000**	

	Emission Factor ($lb/10^3$ gal)									Unit	Emissions (tons/year)									
Activity	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*gal/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	
Propane Torch	7.5000	1.0000	13.0000	0.0160	0.7000	0.7000	12500.0000	0.9000	0.2000	46.83	0.0002	0.0000	0.0003	0.0000	0.0000	0.0000	0.2927	0.0000	0.0000	
											0.0002	**0.0000**	**0.0003**	**0.0000**	**0.0000**	**0.0000**	**0.2927**	**0.0000**	**0.0000**	

Percent PM2.5 and PM10 assumed to be 100%

Drip Torch (Prescribed Burn) 70/30	0.30	gal/ac
Drip Torch (Pile Burn) 70/30	0.04	gal/ton
Propane Torch	2.36	gal/hr
Generator 143 hp	10.39	gal/hr

	Emissions (tons/year)									Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*PM10*	*PM2.5*
Total	**2.84**	**0.04**	**0.19**	**0.00**	**0.85**	**0.11**	**39.08**	**0.00**	**0.00**		
Exhaust	**2.84**	**0.04**	**0.19**	**0.00**	**0.03**	**0.03**	**39.08**	**0.00**	**0.00**		
Fugitive (Paved)					**0.05**	**0.01**					
Fugitive (Unpaved)					**0.76**	**0.08**				**0.47**	**0.05**

Existing Treatments

Emission Factors

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Light Duty Automobile	0.8243	0.0278	0.0586	0.0027	0.0461	0.0191	275.2545	0.0057	0.0052
Light Duty Auto on Paved Road					0.0029	0.0007			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Unpaved Road					0.4695	0.0466			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Paved Road					0.0082	0.0020			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Unpaved Road					0.5760	0.0573			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Paved Road					0.0029	0.0007			

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Chainsaw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Chipper	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Skid Steer Loader	0.6255	0.0198	0.8807	0.0018	0.0155	0.0143	194.5350	0.0000	0.0000

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Tractor	0.9740	0.1295	3.2925	0.0054	0.0601	0.0553	397.8031	0.0000	0.0000

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Excavator	0.6109	0.0243	0.7104	0.0019	0.0166	0.0153	201.6426	0.0000	0.0000

Maximum Daily Emissions

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
1408.00	0.0013	0.0000	0.0001	0.0000	0.0001	0.0000	0.4272	0.0000	0.0000
					0.0020	0.0005			
	0.0013	**0.0000**	**0.0001**	**0.0000**	**0.0021**	**0.0005**	**0.4272**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
90.20	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0321	0.0000	0.0000		
					0.0212	0.0021				0.0130	0.0013
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0212**	**0.0021**	**0.0321**	**0.0000**	**0.0000**		

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
361.35	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.1286	0.0000	0.0000
					0.0015	0.0004			
	0.0003	**0.0000**	**0.0000**	**0.0000**	**0.0015**	**0.0004**	**0.1286**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
5.20	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012	0.0000	0.0000		
					0.0015	0.0001				0.0009	0.0001
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0015**	**0.0001**	**0.0012**	**0.0000**	**0.0000**		

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.85	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000	0.0000
					0.0000	0.0000			
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0002**	**0.0000**	**0.0000**

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
10.45	2.42	0.0031	0.0000	0.0001	0.0000	0.0000	0.0000	0.0093	0.0000	0.0000
		0.0031	**0.0000**	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0093**	**0.0000**	**0.0000**

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
67.00	4.00	0.0016	0.0000	0.0003	0.0000	0.0000	0.0000	0.1274	0.0000	0.0000
		0.0016	**0.0000**	**0.0003**	**0.0000**	**0.0000**	**0.0000**	**0.1274**	**0.0000**	**0.0000**

Horsepower	Unit hours/day	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
70.56	2.45	0.0001	0.0000	0.0002	0.0000	0.0000	0.0000	0.0370	0.0000	0.0000
		0.0001	**0.0000**	**0.0002**	**0.0000**	**0.0000**	**0.0000**	**0.0370**	**0.0000**	**0.0000**

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
18.07	0.08	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0007**	**0.0000**	**0.0000**

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
146.03	2.81	0.0003	0.0000	0.0003	0.0000	0.0000	0.0000	0.0913	0.0000	0.0000
		0.0003	**0.0000**	**0.0003**	**0.0000**	**0.0000**	**0.0000**	**0.0913**	**0.0000**	**0.0000**

Annual Emissions

Unit miles/year	CO2	N2O	CH4
896.00	0.2719	0.0000	0.0000
	0.2719	**0.0000**	**0.0000**

Unit miles/year	CO2	N2O	CH4
57.40	0.0204	0.0000	0.0000
	0.0204	**0.0000**	**0.0000**

Unit miles/year	CO2	N2O	CH4
229.95	0.0818	0.0000	0.0000
	0.0818	**0.0000**	**0.0000**

Unit miles/year	CO2	N2O	CH4
5.20	0.0012	0.0000	0.0000
	0.0012	**0.0000**	**0.0000**

Unit miles/year	CO2	N2O	CH4
0.85	0.0002	0.0000	0.0000
	0.0002	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
10.45	32.03	0.1236	0.0000	0.0000
	0.1236	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
67.00	5.20	0.1657	0.0000	0.0000
	0.1657	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
70.56	13.08	0.1979	0.0000	0.0000
	0.1979	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
18.07	0.50	0.0040	0.0000	0.0000
	0.0040	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
146.03	2.81	0.0913	0.0000	0.0000
	0.0913	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Backhoe	0.6710	0.0300	1.0309	0.0018	0.0261	0.0240	195.2141	0.0000	0.0000

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
83.17	2.81	0.0002	0.0000	0.0003	0.0000	0.0000	0.0000	0.0503	0.0000	0.0000
		0.0002	**0.0000**	**0.0003**	**0.0000**	**0.0000**	**0.0000**	**0.0503**	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
83.17	2.81	0.0503	0.0000	0.0000
		0.0503	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Crane	9.1355	0.1356	1.2963	0.0035	0.0135	0.0102	364.4179	0.0000	0.0000

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
74.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
74.00	0.00	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
String Trimmer	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
67.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
67.00	0.00	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Power pole saw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
10.45	3.41	0.0043	0.0001	0.0002	0.0000	0.0001	0.0000	0.0132	0.0000	0.0000
		0.0043	**0.0001**	**0.0002**	**0.0000**	**0.0001**	**0.0000**	**0.0132**	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
10.45	16.43	0.0634	0.0000	0.0000
		0.0634	**0.0000**	**0.0000**

Equipment Type	Emission Factor (g/hp-hr) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Leaf blower	68.5165	1.1224	2.5378	0.0059	0.6918	0.5227	214.7015	0.0000	0.0000

Horsepower	Unit hours/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
9.39	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Horsepower	Unit hours/year	CO2	N2O	CH4
9.39	0.00	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**

Activity	Emission Factor ($lb/10^3$ gal) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Drip Torch (Prescribed Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000

Unit gal/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unit gal/year	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**

Activity	Emission Factor ($lb/10^3$ gal) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Drip Torch (Pile Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000

Unit gal/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unit gal/year	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**

Activity	Emission Factor ($lb/10^3$ gal) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Propane Torch	7.5000	1.0000	13.0000	0.0160	0.7000	0.7000	12500.0000	0.9000	0.2000

Unit gal/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unit gal/year	CO2	N2O	CH4
0.78	0.0049	0.0000	0.0000
	0.0049	**0.0000**	**0.0000**

Percent PM2.5 and PM10 assumed to be 100%

Drip Torch (Prescribed Burn) 70/30	0.30	gal/ac
Drip Torch (Pile Burn) 70/30	0.04	gal/ton
Propane Torch	2.36	gal/hr
Generator 143 hp	10.39	gal/hr

Total Unit Calculations
miles/year: total vrehicles * (one-way miles * 2)
days/year: total vehicles * total days
hours/year: total equipment * hours per day * days

	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
Total	**0.01**	**0.00**	**0.00**	**0.00**	**0.03**	**0.00**	**0.92**	**0.00**	**0.00**		
Exhaust	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.92**	**0.00**	**0.00**		
Fugitive (Paved)					**0.00**	**0.00**					
Fugitive (Unpaved)					**0.02**	**0.00**				**0.01**	**0.00**

	CO2	N2O	CH4
Total	**1.08**	**0.00**	**0.00**

Maximum Annual Treatments

Emission Factors

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Light Duty Automobile	0.8243	0.0278	0.0586	0.0027	0.0461	0.0191	275.2545	0.0057	0.0052
Light Duty Auto on Paved Road					0.0029	0.0007			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Unpaved Road					0.4695	0.0466			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Paved Road					0.0082	0.0020			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Heavy Truck	0.4225	0.1568	3.3402	0.0115	0.1866	0.1012	1220.9057	0.1919	0.0073
Heavy Truck on Unpaved Road					0.4695	0.0466			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Heavy Truck	0.4225	0.1568	3.3402	0.0115	0.1866	0.1012	1220.9057	0.1919	0.0073
Heavy Truck on Paved Road					0.0082	0.0020			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Unpaved Road					0.3696	0.0367			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Paved Road					0.0278	0.0068			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Type III Fire Engine Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type III Fire Engine on Unpaved Road					0.3696	0.0367			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Type III Fire Engine Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type III Fire Engine on Paved Road					0.0278	0.0068			

Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Type VI Fire Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092

Annual Emissions

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emissions (tons/year)								
207360.00	0.1884	0.0063	0.0134	0.0006	0.0105	0.0044	62.9163	0.0013	0.0012
					0.3003	0.0737			
	0.1884	**0.0063**	**0.0134**	**0.0006**	**0.3108**	**0.0781**	**62.9163**	**0.0013**	**0.0012**

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
	Emissions (tons/year)										
25942.40	0.0246	0.0005	0.0022	0.0001	0.0013	0.0005	9.2301	0.0002	0.0001		
					6.0894	0.6049				3.7266	0.3686
	0.0246	**0.0005**	**0.0022**	**0.0001**	**6.0907**	**0.6054**	**9.2301**	**0.0002**	**0.0001**		

Note: Removed personnel who would arrive by fire engine or water tender (pile and prescribed burning)

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emissions (tons/year)								
48420.90	0.0460	0.0008	0.0041	0.0002	0.0025	0.0010	17.2277	0.0004	0.0002
					0.1988	0.0488			
	0.0460	**0.0008**	**0.0041**	**0.0002**	**0.2013**	**0.0498**	**17.2277**	**0.0004**	**0.0002**

Note: Removed personnel who would arrive by fire engine or water tender (pile and prescribed burning)

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
	Emissions (tons/year)										
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
					0.0000	0.0000				0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emissions (tons/year)								
896.00	0.0004	0.0002	0.0033	0.0000	0.0002	0.0001	1.2059	0.0002	0.0000
					0.0037	0.0009			
	0.0004	**0.0002**	**0.0033**	**0.0000**	**0.0039**	**0.0010**	**1.2059**	**0.0002**	**0.0000**

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
	Emissions (tons/year)										
614.40	0.0004	0.0001	0.0020	0.0000	0.0001	0.0001	0.8247	0.0001	0.0000		
					0.1136	0.0113				0.0695	0.0069
	0.0004	**0.0001**	**0.0020**	**0.0000**	**0.1137**	**0.0113**	**0.8247**	**0.0001**	**0.0000**		

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emissions (tons/year)								
2472.80	0.0016	0.0005	0.0080	0.0000	0.0006	0.0003	3.3193	0.0005	0.0000
					0.0343	0.0084			
	0.0016	**0.0005**	**0.0080**	**0.0000**	**0.0349**	**0.0087**	**3.3193**	**0.0005**	**0.0000**

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
	Emissions (tons/year)										
537.60	0.0005	0.0001	0.0006	0.0000	0.0001	0.0000	0.4779	0.0000	0.0000		
					0.0994	0.0099				0.0608	0.0060
	0.0005	**0.0001**	**0.0006**	**0.0000**	**0.0994**	**0.0099**	**0.4779**	**0.0000**	**0.0000**		

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	Emissions (tons/year)								
1379.70	0.0013	0.0002	0.0015	0.0000	0.0002	0.0001	1.2264	0.0001	0.0000
					0.0191	0.0047			
	0.0013	**0.0002**	**0.0015**	**0.0000**	**0.0193**	**0.0048**	**1.2264**	**0.0001**	**0.0000**

Unit miles/year	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	Controlled PM2.5
	Emissions (tons/year)										
716.80	0.0007	0.0001	0.0008	0.0000	0.0001	0.0000	0.6372	0.0000	0.0000		

Type VI Fire Truck on Unpaved Road				0.3696	0.0367				

					0.1325	0.0131			0.0811 0.0080
	0.0007	**0.0001**	**0.0008**	**0.0000**	**0.1326**	**0.0132**	**0.6372**	**0.0000**	**0.0000**

Vehicle Type	*Emission Factors (g/mile for exhaust or lb/mile for fugitive)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Type VI Fire Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type VI Fire Truck on Paved Road					0.0278	0.0068			

Unit	*Emissions (tons/year)*								
miles/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
1839.60	0.0017	0.0002	0.0020	0.0000	0.0002	0.0001	1.6352	0.0001	0.0000
					0.0255	0.0063			
	0.0017	**0.0002**	**0.0020**	**0.0000**	**0.0257**	**0.0064**	**1.6352**	**0.0001**	**0.0000**

Vehicle Type	*Emission Factors (g/vehicle/day)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Heavy Truck	1.9106	0.0576	3.8065	0.0061	0.0035	0.0034	641.9214	0.1009	0.0027

Unit	*Emissions (tons/year)*								
days/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
28.00	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0198	0.0000	0.0000
	0.0001	**0.0000**	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0198**	**0.0000**	**0.0000**

Vehicle Type	*Emission Factors (g/vehicle/day)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Water Truck	2.0424	0.0796	5.0303	0.0061	0.0145	0.0138	646.4472	0.1016	0.0037

Unit	*Emissions (tons/year)*								
days/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
76.00	0.0002	0.0000	0.0004	0.0000	0.0000	0.0000	0.0542	0.0000	0.0000
	0.0002	**0.0000**	**0.0004**	**0.0000**	**0.0000**	**0.0000**	**0.0542**	**0.0000**	**0.0000**

Vehicle Type	*Emission Factors (g/vehicle/day)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Type III Fire Engine Truck	2.4272	0.2872	1.0018	0.0013	0.0131	0.0126	139.0304	0.0131	0.0675

Unit	*Emissions (tons/year)*								
days/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
42.00	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0064	0.0000	0.0000
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0064**	**0.0000**	**0.0000**

Vehicle Type	*Emission Factors (g/vehicle/day)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Type VI Fire Truck	2.4272	0.2872	1.0018	0.0013	0.0131	0.0126	139.0304	0.0131	0.0675

Unit	*Emissions (tons/year)*								
days/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
56.00	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0086	0.0000	0.0000
	0.0001	**0.0000**	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0086**	**0.0000**	**0.0000**

Vehicle Type	*Emission Factors (g/mile for exhaust or lb/mile for fugittve)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Unpaved Road					0.5760	0.0573			

Unit	*Emissions (tons/year)*									Controlled	
miles/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*PM10*	*PM2.5*
3955.20	0.0886	0.0102	0.0051	0.0000	0.0001	0.0000	0.9424	0.0003	0.0015		
					1.1391	0.1133				0.6972	0.0691
	0.0886	**0.0102**	**0.0051**	**0.0000**	**1.1392**	**0.1133**	**0.9424**	**0.0003**	**0.0015**		

Vehicle Type	*Emission Factors (g/mile for exhaust or lb/mile for fugitive)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Paved Road					0.0029	0.0007			

Unit	*Emissions (tons/year)*								
miles/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
262.65	0.0059	0.0007	0.0003	0.0000	0.0000	0.0000	0.0626	0.0000	0.0001
					0.0004	0.0001			
	0.0059	**0.0007**	**0.0003**	**0.0000**	**0.0004**	**0.0001**	**0.0626**	**0.0000**	**0.0001**

Equipment Type	*Emission Factor (g/hp-hr)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Generator	0.5247	0.0191	0.4421	0.0015	0.0101	0.0093	157.9734	0.0000	0.0000

Horsepower	*Unit*	*Emissions (tons/year)*								
	hours/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
143.18	608.00	0.0504	0.0018	0.0424	0.0001	0.0010	0.0009	15.1592	0.0000	0.0000
		0.0504	**0.0018**	**0.0424**	**0.0001**	**0.0010**	**0.0009**	**15.1592**	**0.0000**	**0.0000**

Equipment Type	*Emission Factor (g/hp-hr)*								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Chainsaw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

Type	*Horsepower*	*Unit*	*Emissions (tons/year)*								
		hours/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	10.45	3635.86	4.6239	0.0643	0.1757	0.0004	0.0547	0.0413	14.0264	0.0000	0.0000
Maintain		2014.58	2.5621	0.0356	0.0973	0.0002	0.0303	0.0229	7.7718	0.0000	0.0000
New (FRA)		2553.55	3.2475	0.0452	0.1234	0.0003	0.0384	0.0290	9.8511	0.0000	0.0000
Maintain (FRA)		1276.78	1.6238	0.0226	0.0617	0.0001	0.0192	0.0145	4.9255	0.0000	0.0000
Total		**9480.77**	**12.0573**	**0.1677**	**0.4580**	**0.0010**	**0.1427**	**0.1078**	**36.5748**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Chipper	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
50 % Cutting	67.00	1327.29	0.5274	0.0078	0.0848	0.0004	0.0016	0.0012	42.2866	0.0000	0.0000
Total		**1327.29**	**0.5274**	**0.0078**	**0.0848**	**0.0004**	**0.0016**	**0.0012**	**42.2866**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Skid Steer Loader	0.6255	0.0198	0.8807	0.0018	0.0155	0.0143	194.5350	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	70.56	2426.62	0.1181	0.0037	0.1662	0.0003	0.0029	0.0027	36.7175	0.0000	0.0000
Maintain		1011.57	0.0492	0.0016	0.0693	0.0001	0.0012	0.0011	15.3061	0.0000	0.0000
New (FRA)		810.65	0.0394	0.0013	0.0555	0.0001	0.0010	0.0009	12.2661	0.0000	0.0000
Maintain (FRA)		426.94	0.0208	0.0007	0.0292	0.0001	0.0005	0.0005	6.4601	0.0000	0.0000
Total		**4675.79**	**0.2275**	**0.0072**	**0.3203**	**0.0007**	**0.0056**	**0.0052**	**70.7497**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Tractor	0.9740	0.1295	3.2925	0.0054	0.0601	0.0553	397.8031	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	18.07	390.66	0.0076	0.0010	0.0256	0.0000	0.0005	0.0004	3.0962	0.0000	0.0000
Maintain		337.19	0.0065	0.0009	0.0221	0.0000	0.0004	0.0004	2.6725	0.0000	0.0000
New (FRA)		48.64	0.0009	0.0001	0.0032	0.0000	0.0001	0.0001	0.3855	0.0000	0.0000
Maintain (FRA)		24.32	0.0005	0.0001	0.0016	0.0000	0.0000	0.0000	0.1927	0.0000	0.0000
Total		**800.81**	**0.0155**	**0.0010**	**0.0253**	**0.0000**	**0.0005**	**0.0004**	**3.0580**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Excavator	0.6109	0.0243	0.7104	0.0019	0.0166	0.0153	201.6426	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	146.03	252.00	0.0248	0.0010	0.0288	0.0001	0.0007	0.0006	8.1796	0.0000	0.0000
Maintain		42.66	0.0042	0.0002	0.0049	0.0000	0.0001	0.0001	1.3847	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**294.66**	**0.0290**	**0.0012**	**0.0337**	**0.0001**	**0.0008**	**0.0007**	**9.5643**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Backhoe	0.6710	0.0300	1.0309	0.0018	0.0261	0.0240	195.2141	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	83.17	280.00	0.0172	0.0008	0.0265	0.0000	0.0007	0.0006	5.0109	0.0000	0.0000
Maintain		42.66	0.0026	0.0001	0.0040	0.0000	0.0001	0.0001	0.7635	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**322.66**	**0.0198**	**0.0009**	**0.0305**	**0.0001**	**0.0008**	**0.0007**	**5.7744**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Crane	9.1355	0.1356	1.2963	0.0035	0.0135	0.0102	364.4179	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	74.00	112.00	0.0835	0.0012	0.0118	0.0000	0.0001	0.0001	3.3293	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**112.00**	**0.0835**	**0.0012**	**0.0118**	**0.0000**	**0.0001**	**0.0001**	**3.3293**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
String Trimmer	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	67.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		64.85	0.0258	0.0004	0.0041	0.0000	0.0001	0.0001	2.0661	0.0000	0.0000
Maintain (FRA)		32.43	0.0129	0.0002	0.0021	0.0000	0.0000	0.0000	1.0331	0.0000	0.0000
Total		**97.28**	**0.0387**	**0.0006**	**0.0062**	**0.0000**	**0.0001**	**0.0001**	**3.0992**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Power pole saw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	10.45	39837.98	50.6643	0.7046	1.9247	0.0042	0.5996	0.4530	153.6865	0.0000	0.0000
Maintain		1075.57	1.3679	0.0190	0.0520	0.0001	0.0162	0.0122	4.1493	0.0000	0.0000
New (FRA)		510.71	0.6495	0.0090	0.0247	0.0001	0.0077	0.0058	1.9702	0.0000	0.0000
Maintain (FRA)		255.36	0.3248	0.0045	0.0123	0.0000	0.0038	0.0029	0.9851	0.0000	0.0000
Total		**41679.62**	**53.0064**	**0.7372**	**2.0136**	**0.0044**	**0.6273**	**0.4739**	**160.7912**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Leaf blower	68.5165	1.1224	2.5378	0.0059	0.6918	0.5227	214.7015	0.0000	0.0000

		Unit	Emissions (tons/year)								
Type	*Horsepower*	*hours/year*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	9.39	339.29	0.2405	0.0039	0.0089	0.0000	0.0024	0.0018	0.7537	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**339.29**	**0.2405**	**0.0039**	**0.0089**	**0.0000**	**0.0024**	**0.0018**	**0.7537**	**0.0000**	**0.0000**

	Emission Factor ($lb/10^3$ gal)								
Activity	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Drip Torch (Prescribed Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000

Unit	Emissions (tons/year)								
gal/year	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
135.00	0.0084	0.0072	0.0317	0.0020	0.0022	0.0022	1.4031	0.0000	0.0000
	0.0084	**0.0072**	**0.0317**	**0.0020**	**0.0022**	**0.0022**	**1.4031**	**0.0000**	**0.0000**

Activity	Emission Factor ($lb/10^3$ gal) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Drip Torch (Pile Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000

Activity	Emission Factor ($lb/10^3$ gal) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Propane Torch	7.5000	1.0000	13.0000	0.0160	0.7000	0.7000	12500.0000	0.9000	0.2000

Percent PM2.5 and PM10 assumed to be 100%

Drip Torch (Prescribed Burn) 70/30	0.30	gal/ac
Drip Torch (Pile Burn) 70/30	0.04	gal/ton
Propane Torch	2.36	gal/hr
Generator 143 hp	10.39	gal/hr

Unit gal/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
17.81	0.0011	0.0010	0.0042	0.0003	0.0003	0.0003	0.1851	0.0000	0.0000
	0.0011	**0.0010**	**0.0042**	**0.0003**	**0.0003**	**0.0003**	**0.1851**	**0.0000**	**0.0000**

Unit gal/year	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
241.66	0.0009	0.0001	0.0016	0.0000	0.0001	0.0001	1.5104	0.0001	0.0000
	0.0009	**0.0001**	**0.0016**	**0.0000**	**0.0001**	**0.0001**	**1.5104**	**0.0001**	**0.0000**

	Emissions (tons/year) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
Total	**66.66**	**0.96**	**3.12**	**0.01**	**8.96**	**1.50**	**453.97**	**0.00**	**0.00**		
Exhaust	**66.66**	**0.96**	**3.12**	**0.01**	**0.80**	**0.60**	**453.97**	**0.00**	**0.00**		
Fugitive (Paved)					**0.58**	**0.14**					
Fugitive (Unpaved)					**7.57**	**0.75**				**4.64**	**0.46**

Maximum Annual Treatments

Emission Factors

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Light Duty Automobile	0.8243	0.0278	0.0586	0.0027	0.0461	0.0191	275.2545	0.0057	0.0052
Light Duty Auto on Paved Road					0.0029	0.0007			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Unpaved Road					0.4695	0.0466			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Paved Road					0.0082	0.0020			

Vehicle Type	Emission Factors (lb/mile) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Heavy Truck	0.4225	0.1568	3.3402	0.0115	0.1866	0.1012	1220.9057	0.1919	0.0073
Heavy Truck on Unpaved Road					0.4695	0.0466			

Vehicle Type	Emission Factors (lb/mile) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Heavy Truck	0.4225	0.1568	3.3402	0.0115	0.1866	0.1012	1220.9057	0.1919	0.0073
Heavy Truck on Paved Road					0.0082	0.0020			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Unpaved Road					0.3696	0.0367			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Paved Road					0.0278	0.0068			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type III Fire Engine Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type III Fire Engine on Unpaved Road					0.3696	0.0367			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type III Fire Engine Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type III Fire Engine on Paved Road					0.0278	0.0068			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type VI Fire Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type VI Fire Truck on Unpaved Road					0.3696	0.0367			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type VI Fire Truck	0.8393	0.1060	0.9804	0.0078	0.1020	0.0488	806.3828	0.0510	0.0092
Type VI Fire Truck on Paved Road					0.0278	0.0068			

Vehicle Type	Emission Factors (g/vehicle/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Heavy Truck	1.9106	0.0576	3.8065	0.0061	0.0035	0.0034	641.9214	0.1009	0.0027

Vehicle Type	Emission Factors (g/vehicle/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	2.0424	0.0796	5.0303	0.0061	0.0145	0.0138	646.4472	0.1016	0.0037

Maximum Daily Emissions

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
2560.00	0.0023	0.0001	0.0002	0.0000	0.0001	0.0001	0.7767	0.0000	0.0000
					0.0037	0.0009			
	0.0023	**0.0001**	**0.0002**	**0.0000**	**0.0038**	**0.0010**	**0.7767**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
114.80	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0408	0.0000	0.0000		
					0.0269	0.0027				0.0165	0.0016
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0270**	**0.0027**	**0.0408**	**0.0000**	**0.0000**		

Note: Removed personnel who would arrive by fire engine or water tender

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
459.90	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.1636	0.0000	0.0000
					0.0019	0.0005			
	0.0004	**0.0000**	**0.0000**	**0.0000**	**0.0019**	**0.0005**	**0.1636**	**0.0000**	**0.0000**

Note: Removed personnel who would arrive by fire engine or water tender

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
					0.0000	0.0000			
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
					0.0000	0.0000			
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
5.20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0070	0.0000	0.0000		
					0.0010	0.0001				0.0006	0.0001
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0010**	**0.0001**	**0.0070**	**0.0000**	**0.0000**		

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
32.85	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0441	0.0000	0.0000
					0.0005	0.0001			
	0.0000	**0.0000**	**0.0001**	**0.0000**	**0.0005**	**0.0001**	**0.0441**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
15.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0139	0.0000	0.0000		
					0.0029	0.0003				0.0018	0.0002
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0029**	**0.0003**	**0.0139**	**0.0000**	**0.0000**		

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
98.55	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0876	0.0000	0.0000
					0.0014	0.0003			
	0.0001	**0.0000**	**0.0001**	**0.0000**	**0.0014**	**0.0003**	**0.0876**	**0.0000**	**0.0000**

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	Controlled PM10	PM2.5
15.60	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0139	0.0000	0.0000		
					0.0029	0.0003				0.0018	0.0002
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0029**	**0.0003**	**0.0139**	**0.0000**	**0.0000**		

Unit miles/day	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
65.70	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000	0.0584	0.0000	0.0000
					0.0009	0.0002			
	0.0001	**0.0000**	**0.0001**	**0.0000**	**0.0009**	**0.0002**	**0.0584**	**0.0000**	**0.0000**

Unit # of Equipment	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unit # of Equipment	Emissions (tons/day) CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
1.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0007	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0007**	**0.0000**	**0.0000**

Total Annual Emissions (Prescribed, Pile, and New)

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
7577.60	2.2992	0.0000	0.0000
	2.2992	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
403.44	0.1435	0.0000	0.0000
	0.1435	**0.0000**	**0.0000**

Note: Removed personnel who would arrive by fire engine or water tender (pile and prescribed burning)

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
1616.22	0.5750	0.0000	0.0000
	0.5750	**0.0000**	**0.0000**

Note: Removed personnel who would arrive by fire engine or water tender (pile and prescribed burning)

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
15.60	0.0209	0.0000	0.0000
	0.0209	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
98.55	0.1323	0.0000	0.0000
	0.1323	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
15.60	0.0139	0.0000	0.0000
	0.0139	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
98.55	0.0876	0.0000	0.0000
	0.0876	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
20.80	0.0185	0.0000	0.0000
	0.0185	**0.0000**	**0.0000**

Unit miles/year	Emissions (tons/year) CO2	N2O	CH4
131.40	0.1168	0.0000	0.0000
	0.1168	**0.0000**	**0.0000**

Unit days/year	Emissions (tons/year) CO2	N2O	CH4
0.00	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**

Unit days/year	Emissions (tons/year) CO2	N2O	CH4
3.00	0.0021	0.0000	0.0000
	0.0021	**0.0000**	**0.0000**

Emission Factors (g/vehicle/day)								
Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type III Fire Engine Truck	2.4272	0.2872	1.0018	0.0013	0.0131	0.0126	139.0304	0.0131	0.0675

	Unit	Emissions (tons/day)								
	# of Equipment	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	3.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0005**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	days/year	CO2	N2O	CH4
	3.00	0.0005	0.0000	0.0000
		0.0005	**0.0000**	**0.0000**

Emission Factors (g/vehicle/day)								
Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Type VI Fire Truck	2.4272	0.2872	1.0018	0.0013	0.0131	0.0126	139.0304	0.0131	0.0675

	Unit	Emissions (tons/day)								
	# of Equipment	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	2.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0003**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	days/year	CO2	N2O	CH4
	4.00	0.0006	0.0000	0.0000
		0.0006	**0.0000**	**0.0000**

Emission Factors (lb/mile)									
Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
ATV ATV on Unpaved Road	20.3222	2.3442	1.1694	0.0021	0.0178 0.5760	0.0079 0.0573	216.1491	0.0670	0.3430

	Unit	Emissions (tons/day)								
	miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	0.00	0.0000	0.0000	0.0000	0.0000	0.0000 0.0000	0.0000 0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	miles/year	CO2	N2O	CH4
	46.80	0.0112	0.0000	0.0000
		0.0112	**0.0000**	**0.0000**

Emission Factors (lb/mile)									
Vehicle Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
ATV ATV on Paved Road	20.3222	2.3442	1.1694	0.0021	0.0178 0.0029	0.0079 0.0007	216.1491	0.0670	0.3430

	Unit	Emissions (tons/day)								
	miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	0.00	0.0000	0.0000	0.0000	0.0000	0.0000 0.0000	0.0000 0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	miles/year	CO2	N2O	CH4
	7.65	0.8268	0.0003	0.0013
		0.8268	**0.0003**	**0.0013**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Generator	0.5247	0.0191	0.4421	0.0015	0.0101	0.0093	157.9734	0.0000	0.0000

		Unit	Emissions (tons/day)								
	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	143.18	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
			0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

		Unit	Emissions (tons/year)		
	Horsepower	hours/year	CO2	N2O	CH4
	143.18	24.00	0.5984	0.0000	0.0000
			0.5984	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Chainsaw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	10.45	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	10.45	49.61	0.1914	0.0000	0.0000
	Maintain		48.42	0.1868	0.0000	0.0000
	New (FRA)		71.45	0.2756	0.0000	0.0000
	Maintain (FRA)		35.72	0.1378	0.0000	0.0000
	Total			**205.20**	**0.7916**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Chipper	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	67.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	50 % Cutting	67.00	33.21	1.0580	0.0000	0.0000
	Total			**33.21**	**1.0580**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Skid Steer Loader	0.6255	0.0198	0.8807	0.0018	0.0155	0.0143	194.5350	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	70.56	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	70.56	90.04	1.3624	0.0000	0.0000
	Maintain		27.43	0.4151	0.0000	0.0000
	New (FRA)		22.68	0.3432	0.0000	0.0000
	Maintain (FRA)		11.95	0.1807	0.0000	0.0000
	Total			**152.10**	**2.3015**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Tractor	0.9740	0.1295	3.2925	0.0054	0.0601	0.0553	397.8031	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	18.07	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	18.07	27.20	0.2156	0.0000	0.0000
	Maintain		4.81	0.0381	0.0000	0.0000
	New (FRA)		1.36	0.0108	0.0000	0.0000
	Maintain (FRA)		0.68	0.0054	0.0000	0.0000
	Total			**34.05**	**0.0489**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Excavator	0.6109	0.0243	0.7104	0.0019	0.0166	0.0153	201.6426	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	146.03	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	146.03	0.00	0.0000	0.0000	0.0000
	Maintain		1.34	0.0435	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000
	Total			**1.34**	**0.0435**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Backhoe	0.6710	0.0300	1.0309	0.0018	0.0261	0.0240	195.2141	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	83.17	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	83.17	0.00	0.0000	0.0000	0.0000
	Maintain		1.34	0.0240	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000
	Total			**1.34**	**0.0240**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Crane	9.1355	0.1356	1.2963	0.0035	0.0135	0.0102	364.4179	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	74.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	74.00	0.00	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000
	Total			**0.00**	**0.0000**	**0.0000**	**0.0000**

Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
String Trimmer	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

			Unit	Emissions (tons/day)								
	Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	New	67.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

			Unit	Emissions (tons/year)		
	Type	Horsepower	hours/year	CO2	N2O	CH4
	New	67.00	0.00	0.0000	0.0000	0.0000
	Maintain		0.00	0.0000	0.0000	0.0000
	New (FRA)		1.81	0.0578	0.0000	0.0000
	Maintain (FRA)		0.91	0.0289	0.0000	0.0000
	Total			**2.72**	**0.0867**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Power pole saw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

		Unit	Emissions (tons/day)								
Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
New	10.45	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

		Unit	Emissions (tons/year)		
Type	Horsepower	hours/year	CO2	N2O	CH4
New	10.45	180.36	0.6958	0.0000	0.0000
Maintain		25.93	0.1000	0.0000	0.0000
New (FRA)		14.29	0.0551	0.0000	0.0000
Maintain (FRA)		7.14	0.0276	0.0000	0.0000
Total		**227.72**	**0.8785**	**0.0000**	**0.0000**

	Emission Factor (g/hp-hr)								
Equipment Type	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Leaf blower	68.5165	1.1224	2.5378	0.0059	0.6918	0.5227	214.7015	0.0000	0.0000

		Unit	Emissions (tons/day)								
Type	Horsepower	hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
New	9.39	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Horsepower	Unit	Emissions (tons/year)		
Type		hours/year	CO2	N2O	CH4
New	9.39	17.86	0.0397	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000
Total		**17.86**	**0.0397**	**0.0000**	**0.0000**

	Emission Factor (lb/10^3 gal)								
Activity	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Drip Torch (Prescribed Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000

	Unit	Emissions (tons/day)								
	gal/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	15.00	0.0009	0.0008	0.0035	0.0002	0.0002	0.0002	0.1559	0.0000	0.0000
		0.0009	**0.0008**	**0.0035**	**0.0002**	**0.0002**	**0.0002**	**0.1559**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	gal/year	CO2	N2O	CH4
	15.00	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**

	Emission Factor (lb/10^3 gal)								
Activity	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Drip Torch (Pile Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	0.0000	20786.6246	0.0000	0.0000

	Unit	Emissions (tons/day)								
	gal/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	gal/year	CO2	N2O	CH4
	0.94	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**

	Emission Factor (lb/10^3 gal)								
Activity	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Propane Torch	7.5000	1.0000	13.0000	0.0160	0.7000	0.7000	12500.0000	0.9000	0.2000

	Unit	Emissions (tons/day)								
	gal/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	Unit	Emissions (tons/year)		
	gal/year	CO2	N2O	CH4
	6.45	0.0000	0.0000	0.0000
		0.0000	**0.0000**	**0.0000**

Percent PM2.5 and PM10 assumed to be 100%

Drip Torch (Prescribed Burn) 70/30	0.30	gal/ac
Drip Torch (Pile Burn) 70/30	0.04	gal/ton
Propane Torch	2.36	gal/hr
Generator 143 hp	10.39	gal/hr

	Emissions (tons/day)									Controlled	
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	PM10	PM2.5
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.04**	**0.01**	**1.36**	**0.00**	**0.00**		
Exhaust	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.36**	**0.00**	**0.00**		
Fugitive (Paved)					**0.01**	**0.00**					
Fugitive (Unpaved)					**0.03**	**0.00**				**0.02**	**0.00**

	Emissions (tons/year)		
	CO2	N2O	CH4
Total	**10.12**	**0.00**	**0.00**

Maximum Annual Treatments

Emission Factors

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Light Duty Automobile	0.8243	0.0278	0.0586	0.0027	0.0461	0.0191	275.2545	0.0057	0.0052
Light Duty Auto on Paved Road					0.0029	0.0007			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Unpaved Road					0.4695	0.0466			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Paved Road					0.0082	0.0020			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Unpaved Road					0.3696	0.0367			

Vehicle Type	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Water Truck	0.5724	0.1931	2.9264	0.0115	0.2037	0.1175	1217.7201	0.1914	0.0090
Water Truck on Paved Road					0.0278	0.0068			

Equipment Type	Emission Factor (g/hp-hr)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Leaf blower	68.5165	1.1224	2.5378	0.0059	0.6918	0.5227	214.7015	0.0000	0.0000

Activity	Emission Factor ($lb/10^3$ gal)								
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
Drip Torch (Pile Burn) 70/30	123.8836	107.1878	469.8935	30.0776	32.5139	32.5139	20786.6246	0.0000	0.0000

Drip Torch (Pile Burn) 70/30	0.04	gal/ton
Propane Torch	2.36	gal/hr
Generator 143 hp	10.39	gal/hr

Maximum Daily Emissions

Unit	Emissions (tons/day)								
miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
1280.00	0.0012	0.0000	0.0001	0.0000	0.0001	0.0000	0.3884	0.0000	0.0000
					0.0019	0.0005			
	0.0012	**0.0000**	**0.0001**	**0.0000**	**0.0019**	**0.0005**	**0.3884**	**0.0000**	**0.0000**

Unit	Emissions (tons/day)									Controlled	
miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	PM10	PM2.5
73.80	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0263	0.0000	0.0000		
					0.0173	0.0017				0.0106	0.0010
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0173**	**0.0017**	**0.0263**	**0.0000**	**0.0000**		

Note: Removed personnel who would arrive by water truck

Unit	Emissions (tons/day)								
miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
295.65	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.1052	0.0000	0.0000
					0.0012	0.0003			
	0.0003	**0.0000**	**0.0000**	**0.0000**	**0.0012**	**0.0003**	**0.1052**	**0.0000**	**0.0000**

Note: Removed personnel who would arrive by water truck

Unit	Emissions (tons/day)									Controlled	
miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	PM10	PM2.5
5.20	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0070	0.0000	0.0000		
					0.0010	0.0001				0.0006	0.0001
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0010**	**0.0001**	**0.0070**	**0.0000**	**0.0000**		

Unit	Emissions (tons/day)								
miles/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
32.85	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0441	0.0000	0.0000
					0.0005	0.0001			
	0.0000	**0.0000**	**0.0001**	**0.0000**	**0.0005**	**0.0001**	**0.0441**	**0.0000**	**0.0000**

Type	Horsepower	Unit	Emissions (tons/day)								
		hours/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
New	9.39	10.00	0.0071	0.0001	0.0003	0.0000	0.0001	0.0001	0.0222	0.0000	0.0000
Maintain			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)			0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**10.00**	**0.0071**	**0.0001**	**0.0003**	**0.0000**	**0.0001**	**0.0001**	**0.0222**	**0.0000**	**0.0000**

Unit	Emissions (tons/day)								
gal/day	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4
0.53	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000	0.0055	0.0000	0.0000
	0.0000	**0.0000**	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0055**	**0.0000**	**0.0000**

	Emissions (tons/day)									Controlled	
	CO	ROG	NOx	SOx	PM10	PM2.5	CO2	N2O	CH4	PM10	PM2.5
Total	**0.01**	**0.00**	**0.00**	**0.00**	**0.02**	**0.00**	**0.60**	**0.00**	**0.00**		
Exhaust	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.60**	**0.00**	**0.00**		
Fugitive (Paved)					**0.00**	**0.00**					
Fugitive (Unpaved)					**0.02**	**0.00**				**0.01**	**0.00**

Maximum Annual Treatments

Emission Factors

	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Vehicle Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Light Duty Automobile	0.8243	0.0278	0.0586	0.0027	0.0461	0.0191	275.2545	0.0057	0.0052
Light Duty Auto on Paved Road					0.0029	0.0007			

	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Vehicle Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Unpaved Road					0.4695	0.0466			

	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Vehicle Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Van/Medium Truck	0.8620	0.0159	0.0772	0.0032	0.0463	0.0192	322.7684	0.0067	0.0038
Van/Medium Truck on Paved Road					0.0082	0.0020			

	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Vehicle Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Unpaved Road					0.5760	0.0573			

	Emission Factors (g/mile for exhaust or lb/mile for fugitive)								
Vehicle Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
ATV	20.3222	2.3442	1.1694	0.0021	0.0178	0.0079	216.1491	0.0670	0.3430
ATV on Paved Road					0.0029	0.0007			

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Generator	0.5247	0.0191	0.4421	0.0015	0.0101	0.0093	157.9734	0.0000	0.0000

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Chainsaw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Chipper	5.3797	0.0798	0.8650	0.0042	0.0159	0.0120	431.3772	0.0000	0.0000

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Skid Steer Loader	0.6255	0.0198	0.8807	0.0018	0.0155	0.0143	194.5350	0.0000	0.0000

	Emission Factor (g/hp-hr)								
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*

Maximum Daily Emissions

Unit	Emissions (tons/day)								
miles/day	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
1408.00	0.0013	0.0000	0.0001	0.0000	0.0001	0.0000	0.4272	0.0000	0.0000
					0.0020	0.0005			
	0.0013	**0.0000**	**0.0001**	**0.0000**	**0.0021**	**0.0005**	**0.4272**	**0.0000**	**0.0000**

		Controlled	
Unit	Emissions (tons/day)		
miles/day	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*PM10*	*PM2.5*
90.20	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0321	0.0000	0.0000		
					0.0212	0.0021				0.0130	0.0013
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0212**	**0.0021**	**0.0321**	**0.0000**	**0.0000**		

Unit	Emissions (tons/day)								
miles/day	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
361.35	0.0003	0.0000	0.0000	0.0000	0.0000	0.0000	0.1286	0.0000	0.0000
					0.0015	0.0004			
	0.0003	**0.0000**	**0.0000**	**0.0000**	**0.0015**	**0.0004**	**0.1286**	**0.0000**	**0.0000**

		Controlled	
Unit	Emissions (tons/day)		
miles/day	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*PM10*	*PM2.5*
5.20	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012	0.0000	0.0000		
					0.0015	0.0001				0.0009	0.0001
	0.0001	**0.0000**	**0.0000**	**0.0000**	**0.0015**	**0.0001**	**0.0012**	**0.0000**	**0.0000**		

Unit	Emissions (tons/day)								
miles/day	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
32.85	0.0007	0.0001	0.0000	0.0000	0.0000	0.0000	0.0078	0.0000	0.0000
					0.0000	0.0000			
	0.0007	**0.0001**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0078**	**0.0000**	**0.0000**

	Unit	Emissions (tons/day)								
Horsepower	*hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
143.18	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

		Unit	Emissions (tons/day)								
Type	*Horsepower*	*hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	10.45	26.00	0.0331	0.0005	0.0013	0.0000	0.0004	0.0003	0.1003	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**26.00**	**0.0331**	**0.0005**	**0.0013**	**0.0000**	**0.0004**	**0.0003**	**0.1003**	**0.0000**	**0.0000**

		Unit	Emissions (tons/day)								
Type	*Horsepower*	*hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	67.00	8.00	0.0032	0.0000	0.0005	0.0000	0.0000	0.0000	0.2549	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.00**	**0.0032**	**0.0000**	**0.0005**	**0.0000**	**0.0000**	**0.0000**	**0.2549**	**0.0000**	**0.0000**

		Unit	Emissions (tons/day)								
Type	*Horsepower*	*hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	70.56	16.00	0.0008	0.0000	0.0011	0.0000	0.0000	0.0000	0.2421	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**16.00**	**0.0008**	**0.0000**	**0.0011**	**0.0000**	**0.0000**	**0.0000**	**0.2421**	**0.0000**	**0.0000**

		Unit	Emissions (tons/day)								
Type	*Horsepower*	*hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	18.07	8.00	0.0002	0.0000	0.0005	0.0000	0.0000	0.0000	0.0634	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

				Emission Factor (g/hp-hr)					
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Tractor	0.9740	0.1295	3.2925	0.0054	0.0601	0.0553	397.8031	0.0000	0.0000

				Emission Factor (g/hp-hr)					
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Excavator	0.6109	0.0243	0.7104	0.0019	0.0166	0.0153	201.6426	0.0000	0.0000

				Emission Factor (g/hp-hr)					
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Backhoe	0.6710	0.0300	1.0309	0.0018	0.0261	0.0240	195.2141	0.0000	0.0000

				Emission Factor (g/hp-hr)					
Equipment Type	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Power pole saw	110.4151	1.5355	4.1945	0.0092	1.3066	0.9872	334.9362	0.0000	0.0000

Percent PM2.5 and PM10 assumed to be 100%

Drip Torch (Prescribed Burn) 70/30	0.30	gal/ac
Drip Torch (Pile Burn) 70/30	0.04	gal/ton
Propane Torch	2.36	gal/hr
Generator 143 hp	10.39	gal/hr

Type	*Horsepower*	*Unit hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.00**	**0.0002**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Type	*Horsepower*	*Unit hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	146.03	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Type	*Horsepower*	*Unit hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	83.17	0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.00**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Type	*Horsepower*	*Unit hours/day*	*CO*	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
New	10.45	14.00	0.0178	0.0002	0.0007	0.0000	0.0002	0.0002	0.0540	0.0000	0.0000
Maintain		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
New (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maintain (FRA)		0.00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**14.00**	**0.0178**	**0.0002**	**0.0007**	**0.0000**	**0.0002**	**0.0002**	**0.0540**	**0.0000**	**0.0000**

										Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*	*PM10*	*PM2.5*
Total	**0.06**	**0.00**	**0.00**	**0.00**	**0.03**	**0.00**	**1.24**	**0.00**	**0.00**		
Exhaust	**0.06**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.24**	**0.00**	**0.00**		
Fugitive (Paved)					**0.00**	**0.00**					
Fugitive (Unpaved)					**0.02**	**0.00**				**0.01**	**0.00**

Prescribed Burn Emissions **Emission in Pounds per Acre**

		PM 10			PM 2.5			CH4			CO			CO2				NOX		SO2			ROG
FOFEM Veg Type	**Consumed Fuel per Acre (Tons)**	**flaming**	**smoldering**	**total**	**flaming**	**smoldering**	**total**	**flaming**	**smoldering**	**total**	**flaming**	**smoldering**	**total**	**flaming**	**smoldering**	**total**	**flaming**	**smoldering**	**total**	**flaming**	**smoldering**	**total**	**total**
Woodlands (Broadleaf Forest)	17	19	729	748	16	618	634	5	375	380	41	8,236	827	11,053	33,522	44,575	20	0	20	6	27	33	214
Shrublands (Chamise Chaparral)	11	66	0	66	56	0	56	17	0	17	141	0	141	38,414	0	38,414	69	0	69	22	0	22	270
Grasslands (Valley Grassland)	2	11	0	11	9	0	9	3	0	3	23	0	23	6,402	0	6,402	12	0	12	4	0	4	19
		PM 10			**PM 2.5**			**CH4**			**CO**			**CO2**				**NOX**		**SO2**			**ROG**
FOFEM Veg Type		*flaming*	*smoldering*	*total*	*flaming*	*smoldering*	*total*	*flaming*	*smoldering*	*total*	*flaming*	*smoldering*	*total*	*flaming*	*smoldering*	*total*	*flaming*	*smoldering*	*total*	*flaming*	*smoldering*	*total*	*total*
Woodlands (60 percent)	17	11.4	437.4	448.8	9.6	370.8	380.4	3.0	225.0	228.0	24.6	4,941.6	496.2	6,631.8	20,113.2	26,745.0	12.0	0.0	12.0	3.6	16.2	19.8	128.6
Shrublands (30 percent)	11	19.8	0.0	19.8	16.8	0.0	16.8	5.1	0.0	5.1	42.3	0.0	42.3	11,524.2	0.0	11,524.2	20.7	0.0	20.7	6.6	0.0	6.6	81.0
Grasslands (10 percent)	2	1.1	0.0	1.1	0.9	0.0	0.9	0.3	0.0	0.3	2.3	0.0	2.3	640.2	0.0	640.2	1.2	0.0	1.2	0.4	0.0	0.4	1.9
Total Emissions of 1 acre		**32.3**	**437.4**	**469.7**	**27.3**	**370.8**	**398.1**	**8.4**	**225.0**	**233.4**	**69.2**	**4,941.6**	**540.8**	**18,796.2**	**20,113.2**	**38,909.4**	**33.9**	**0.0**	**33.9**	**10.6**	**16.2**	**26.8**	**211.6**

Note: FOFEM does not model ROG emissions. ROG emission factors from forest wildfires are used as a proxy using the weighted average of flaming and smoldering.

ROG/NMHC Factor (lbs/ton)

Vegetation	Total
Grass	10.7
Chaparral shrub	25.0
Hardwood	12.8

Source: USEPA 1996, CARB August 2000

Pile Burn Emissions

Pile		Gross	Adjusted*	Pile	Consumed	Emissions by pollutant (tons)								
Group	Fuel	Volume	Volume	Biomass	Fuel									
Name	(tons)	(cubic ft)	(cubic ft)	(tons)	(tons)	PM	PM_{10}	$PM_{2.5}$	CO	CO_2	CH_4	NMHC	NOx	SOx
Total 1250 piles	500	294,524	234,565	258	232	2.54	1.80	1.57	8.82	386	0.65	0.53	0.46	0.25
Average Daily=35	14	8,247	6,568	7.22	6.50	0.071	0.050	0.044	0.25	10.8	0.018	0.015	0.01	0.01
2.5 piles	1	589	469	0.52	0.46	0.0051	0.0036	0.0031	0.018	0.77	0.0013	0.0011	0.00	0.00

Note: Assumes hand piles, in a parabolic shape of 6 ft height and 10 ft width, composed of mixed shrub/hardwood vegetation with 90% consumption.
Consume does not model NOx or SOx emissions; emission factor per ton consumed fuel from Source: Urbanski 2013
ROG is likely less than NMHC so it is conservative to assume it is equal

Annual SFBAAB Existing Activities

	Emissions (tons/year)								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Pile Burn	0.02	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00
Exhaust	2.84	0.04	0.19	0.00	0.03	0.03	39.1	0.00	0.00
Fugitive (Paved)					0.05	0.01			
Fugitive (Unpaved)					0.76	0.08			
Total	2.86	0.04	0.19	0.00	0.85	0.12	39.8	0.00	0.00
Significance Threshold		10	10		15	10			

NCCAB Existing Activities

	Maximum Daily Emissions (lb/day)						Emissions (tons/year)		
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Pile Burn									
Exhaust	22.8	0.43	2.87	0.02	0.41	0.25	1.08	0.00	0.00
Fugitive (Paved)					7.05	1.73			
Fugitive (Unpaved)					45.3	4.50			
Total	22.82	0.43	2.87	0.02	52.79	6.48	1.08	0.00	0.00
Significance Threshold	550	137	137	150	82	55			

Annual Total GHG Emissions Existing

	Emissions (tons/year)			
	CO2	*N2O*	*CH4*	*CO2e (MT)*
Pile Burn	0.77	0.00	0.00	0.73
Exhaust	40.15	0.00	0.00	36.49
Total	40.93	0.00	0.00	37.23

Annual SFBAAB Potential Activities

	Emissions (tons/year)								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Prescribed Burn	121.68	47.60	7.63	6.03	105.68	89.57	8754.62	0.00	52.52
Pile Burn	8.38	0.50	0.44	0.23	1.71	1.49	366.93	0.00	0.62
Exhaust	66.66	0.96	3.12	0.01	0.80	0.60	453.97	0.00	0.00
Fugitive (Paved)					0.58	0.14			
Fugitive (Unpaved)					7.57	0.75			
Total	196.72	49.06	11.19	6.27	116.35	92.56	9575.52	0.00	53.14
Significance Threshold		10	10		15	10			

Maximum Daily NCCAB Potential Activities (Prescribed Burn)								
	Emissions (lbs/day)						Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*PM10*	*PM2.5*
Prescribed Burn	1150.00	963.00	600.00	200.00	550.00	550.00	550.00	550.00
Pile Burn								
Exhaust	8.04	1.85	8.17	0.47	0.87	0.65	0.87	0.65
Fugitive (Paved)					16.66	4.09	16.66	4.09
Fugitive (Unpaved)					67.35	6.69	41.21	4.07
Total	1158.04	964.85	608.17	200.47	634.88	561.43	608.74	558.81
Significance Threshold	550	137	137	150	82	55	82	55

Maximum Daily NCCAB Potential Activities (Pile Burn)

	Emissions (lbs/day)						Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*PM10*	*PM2.5*
Prescribed Burn								
Pile Burn	493.86	29.42	26.00	13.78	100.76	87.76	100.76	87.76
Exhaust	17.32	0.40	1.26	0.03	0.35	0.20	0.35	0.20
Fugitive (Paved)					7.05	1.73	7.05	1.73
Fugitive (Unpaved)					36.6	3.63	22.4	2.21
Total	511.18	29.82	27.26	13.81	144.71	93.32	130.53	91.90
Significance Threshold	550	137	137	150	82	55	82	55

Maximum Daily NCCAB Potential Activities (New Treatment)

	Emissions (lbs/day)						Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*PM10*	*PM2.5*
Prescribed Burn								
Pile Burn								
Exhaust	113.61	1.69	7.35	0.03	1.45	1.04	1.45	1.04
Fugitive (Paved)					7.05	1.73	7.05	1.73
Fugitive (Unpaved)					45.34	4.50	27.75	2.74
Total	113.61	1.69	7.35	0.03	53.84	7.27	36.24	5.51
Significance Threshold	550	137	137	150	82	55	82	55

Annual NCCAB GHG Emissions Potential

	Emissions (tons/year)			
	CO2	*N2O*	*CH4*	*CO2e (MT)*
Prescribed Burn	160.05	0.00	0.08	147.10
Pile Burn	19.31	0.00	0.03	18.35
Exhaust	10.12	0.00	0.00	9.30
Total	189.48	0.00	0.11	174.75

Annual Total GHG Emissions

	Emissions (tons/year)			
	CO2	*N2O*	*CH4*	*CO2e (MT)*
Prescribed Burn	8914.67	0.00	52.59	9423.10
Pile Burn	386.24	0.00	0.65	366.92
Exhaust	464.09	0.00	0.00	422.03
Total	9765.00	0.00	53.25	10212.04

Net Annual Average SFBAAB									
	Emissions (tons/year)								
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*CO2*	*N2O*	*CH4*
Prescribed Burn	121.68	47.60	7.63	6.03	105.68	89.57	8754.62	0.00	52.52
Pile Burn	8.36	0.50	0.44	0.23	1.71	1.49	366.16	0.00	0.62
Exhaust	63.82	0.92	2.93	0.01	0.77	0.58	414.89	0.00	0.00
Fugitive (Paved)					0.53	0.13			
Fugitive (Unpaved)					6.81	0.68			
Total	193.86	49.02	11.00	6.27	115.50	92.44	9535.67	0.00	53.13
Significance Threshold		10	10		15	10			

Net Maximum Daily NCCAB (Prescribed Burn)

	Emissions (lbs/day)						Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*PM10*	*PM2.5*
Prescribed Burn	1150.00	963.00	600.00	200.00	550.00	550.00	550.00	550.00
Pile Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exhaust	-14.77	1.42	5.30	0.46	0.46	0.40	0.46	0.40
Fugitive (Paved)					9.62	2.36	9.62	2.36
Fugitive (Unpaved)					22.01	2.18	13.47	1.33
Total	1135.23	964.42	605.30	200.46	582.08	554.94	573.54	554.09
Significance Threshold	550	137	137	150	82	55	82	55

Net Maximum Daily NCCAB (Pile Burn)

	Emissions (lbs/day)						Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*PM10*	*PM2.5*
Prescribed Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile Burn	494	29.4	26.0	13.78	101	87.8	101	87.8
Exhaust	-5.49	-0.03	-1.61	0.01	-0.06	-0.05	-0.06	-0.05
Fugitive (Paved)					0.00	0.00	0.00	0.00
Fugitive (Unpaved)					-8.8	-0.87	-5.37	-0.53
Total	488.37	29.39	24.39	13.79	91.92	86.84	95.32	87.18
Significance Threshold	550	137	137	150	82	55	82	55

Net Maximum Daily NCCAB (New Treatment)

	Emissions (lbs/day)						Controlled	
	CO	*ROG*	*NOx*	*SOx*	*PM10*	*PM2.5*	*PM10*	*PM2.5*
Prescribed Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pile Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exhaust	90.8	1.26	4.48	0.01	1.04	0.79	1.04	0.79
Fugitive (Paved)					0.00	0.00	0.00	0.00
Fugitive (Unpaved)					0.00	0.00	0.00	0.00
Total	90.8	1.26	4.48	0.01	1.04	0.79	1.04	0.79
Significance Threshold	550	137	137	150	82	55	82	55

APPENDIX 4.4 BIOLOGICAL RESOURCES SUPPORTING INFORMATION

Appendix 4.4a Vegetation Communities

Appendix 4.4b Special-Status Species Tables

Appendix 4.4c Special-Status Wildlife Species Descriptions

Appendix 4.4d Streambed Alteration Agreement

Appendix 4.4a Vegetation Communities

Vegetation Communities

General descriptions of vegetation types mapped within the Midpen lands are collapsed into generalized "Midpen Types." These vegetation categories are based on geographic distribution, structure, fire behavior, and special-status plant species preferences. This is an effort to relate vegetation community names to these commonly used classification systems for regional context and regulatory continuity. Table 1 provides the detailed vegetation crosswalks for upland and aquatic communities that compare general Program vegetation types to those in the Midpen dataset, as well as other commonly used vegetation classification systems, notably the *Terrestrial Natural Communities of California* (Holland, 1986) or *California Vegetation* (Holland & Keil, 1995); *A Manual of California Vegetation* (Sawyer *et al*. 2009); and habitat types from the *CNPS Inventory of Rare and Endangered Plants of California* (CNPS, 2020). It is also intended to connect Midpen vegetation types to currently accepted types of sensitive natural communities and rare plant habitat descriptors. The codes used in the Tables are associated with specific vegetation types that indicate various levels of organization sensitivity. The numeric codes following vegetation types in the Terrestrial Communities and California Vegetation columns align these vegetation types with the California Natural Communities List (CDFW, 2019). It is from this list that sensitive natural communities, those with State Ranks (S1-S3), are identified. In these cases, vegetation types in the California Vegetation column will be noted with their appropriate State Rank.

The crosswalks presented in this table relate vegetation community names to these commonly used classification systems for regional context and regulatory continuity. Midpen vegetation types are also linked to currently accepted types of sensitive natural communities and rare plant habitat descriptors. The codes used in these tables are associated with specific vegetation types that indicate various levels of organization sensitivity. The numeric codes following vegetation types in the Terrestrial Communities and California Vegetation columns align these vegetation types with the *California Natural Communities List* (CDFW, 2019). It is from this list that sensitive natural communities, those with State Ranks (S1-S3), are identified. Vegetation types in the California Vegetation column will be noted with their appropriate State Rank.

Table 1 Upland Vegetation Communities Found on Midpen Lands and Potential for Sensitive Communities to Occur

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Non-Native / Ornamental					
Acacia Series	9.25	Ruderal (Not Described)	Not Described	--	Not Described
Broom Series	46.45	Ruderal (Not Described)	Broom (*Cytisus scoparius* and Others) Shrubland Semi-Natural Alliance	--	Not Described
Eucalyptus Series	186.5	Eucalyptus Plantation (Not Described)	*Eucalyptus* spp. – *Ailanthus altissima* – *Robinia pseudoacacia* Woodland Semi-Natural Alliance	--	Not Described
Harding Grass Series	77.26	Freshwater Seep (45400) Non-Native Grassland (42200) Ruderal (Not Described)	*Phalaris aquatica* – *Phalaris arundinacea* Herbaceous Semi-Natural Alliance (Harding Grass – Reed Canary Grass Swards) (42.051.00)	--	Valley and Foothill Grassland
Planted Stands of Pine (Monterey Pine - Monterey Cypress - other spp.)	91.25	Pine Plantation (Not Described)	*Pinus radiata* Semi-Natural Alliance (Monterey Pine Plantations) (87.240.04)	--	Not Described
Poison Hemlock (mapped based on plot data only)	4.40	Non-Native Grassland (42200) Ruderal (Not Described)	*Conium maculatum - Foeniculum vulgare* Herbaceous Semi-Natural Stand (Poison Hemlock or Fennel Patches) (45.556.00)	--	Valley and Foothill Grassland

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Weedy Ruderal (Harding Grass - Velvet Grass - Thistle spp.)	304.01	Non-Native Grassland (42200) Freshwater Seep (45400) Ruderal (Not Described)	*Holcus lanatus – Anthoxanthum odoratum* Herbaceous Semi-Natural Alliance (Common Velvet Grass -Sweet Vernal Grass Meadows) (42.050.00)	--	Valley and Foothill Grassland
Yellow Star-thistle Series	163.27	Non-Native Grassland (42200) Ruderal (Not Described)	*Centaurea (solstitialis, melitensis*) Herbaceous Semi-Natural Alliance (Yellow Star-Thistle Fields) (42.042.00)	--	Valley and Foothill Grassland
Grassland					
California Annual Grasslands Series	6,150.00 (+35.68 on serpentine)	Non-Native Grassland (42200)	*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance (Wild Oats and Annual Brome Grasslands) (42.027.00)	--	Valley and Foothill Grassland
California Annual Grasslands with a Native Component Mapping Unit	35.13 (+1.63 on serpentine)	Non-Native Grassland (42200) Valley Needlegrass Grassland (42110) Wildflower Fields (42300)	*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance (Wild Oats and Annual Brome Grasslands) (42.027.00)	--	Valley and Foothill Grassland
			Bromus carinatus – Elymus glaucus Herbaceous Alliance (California Brome – Blue Wildrye Prairie) (41.131.00)	S3 / BHS	
			Danthonia californica Herbaceous Alliance (California Oatgrass Prairie) (41.050.00)	S3 / BHS	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
			Elymus triticoides Herbaceous Association (Creeping Ryegrass Turfs) (41.080.01)	S3 / BHS	
			Grindelia camporum Herbaceous Alliance (Gumplant Patches) (52.206.00)	S3 / BHS	
			Festuca idahoensis Herbaceous Alliance (Idaho Fescue Grassland) (41.250.00)	S3? / BHS	
			Nasella spp. – *Melica* spp. Herbaceous Alliance (Needlegrass – Melic Grass Grassland) (41.151.00)	S3 / BHS	
Mixed California Annual Grassland - Purple Needlegrass Association	23.00	Non-Native Grassland (42200) Serpentine Bunchgrass (42130) Valley Needlegrass Grassland (42110) Wildflower Fields (42300)	*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance (Wild Oats and Annual Brome Grasslands) (42.027.00)	--	Valley and Foothill Grassland
			Nassella spp. – *Melica* spp. Herbaceous Alliance (Needlegrass – Melic Grass Grassland) (41.151.00)	S3 / BHS	
Purple Needlegrass Association	1.85	Serpentine Bunchgrass (42130) Valley Needlegrass Grassland (42110) Wildflower Fields (42300)	*Nasella* spp. – *Melica* spp. Herbaceous Alliance (Needlegrass – Melic Grass Grassland) (41.151.00)	S3	Valley and Foothill Grassland

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation Name	California Vegetation Designation [d]	CNPS Inventory [e]
Coastal Scrub					
California Sagebrush Series	132.02 (+4.17 on serpentine)	Central (Lucian) Coastal Scrub (32200)	*Artemisia californica* Sagesbrush Scrub Alliance (California Sagebrush Scrub) (32.010.00)	BHS when on serpentine	Coastal Scrub
Coyote Brush Series	460.15 (+0.95 on serpentine)	Northern Coyote Brush Scrub (32110)	*Baccharis pilularis* Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	Coastal Scrub
Coyote Brush – California Sagebrush Series	5.41	Northern Coyote Brush Scrub (32110)	*Artemisia californica* Sagebrush Scrub Alliance (California Sagebrush Scrub) (32.010.00)	BHS when on serpentine	Coastal Scrub
			Baccharis pilularis Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	
Coyote Brush - Sticky Monkeyflower Series	10.27	Central (Lucian) coastal scrub (32200)	*Baccharis pilularis* Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	Coastal Scrub
		Northern Coyote Brush Scrub (32110)	*Diplacus aurantiacus* Shrubland Alliance (Bush Monkeyflower Scrub) (32.082.00)	S3?	
Coyote Brush, Successional Stage	10.26	Northern Coyote Brush Scrub (32110)	*Baccharis pilularis* Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	Coastal Scrub
Coyote Brush Mesic Stands (Coyote Brush - Ocean Spray - *Rubus* spp.)	2,485.08	Mesic North Slope Chaparral (37E00)	*Baccharis pilularis* Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	Coastal Scrub

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
		Northern Coyote Brush Scrub (32110)	*Baccharis pilularis – Holodiscus discolor* Shrubland Association (Coyote Brush – Oceanspray Scrub) (32.060.12)	S3	
			Rubus (*parviflorus, spectablis, ursinus*) Shrubland Alliance (Coastal Brambles) (63.910.00)	S3	
Coyote Brush Open Stands (Coyote Brush / California Annual Grasslands)	1,541.54	Non-Native Grassland (42200) Northern Coyote Brush Scrub (32110)	*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance (Wild Oats and Annual Brome Grasslands) (42.027.00)	--	Coastal Scrub
			Baccharis pilularis Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	
Coyote Brush Xeric Stands (Coyote Brush - California Sagebrush – Mimulus aurantiacus)	566.28	Northern Coyote Brush Scrub (32110)	*Artemisia californica* Shrubland Alliance (California Sagebrush Scrub) (32.010.00)	BHS when on serpentine	Coastal Scrub
			Baccharis pilularis Shrubland Alliance (Coyote Brush Scrub) (32.060.00)	BHS when on serpentine	
			Diplacus aurantiacus Shrubland Alliance (Bush Monkeyflower Scrub) (32.082.00)	S3?	
Mesic Deciduous Shrubs (Hazelnut - Dogwood - Holodiscus - Poison Oak)	255.92	Mesic North Slope Chaparral (37E00)	*Corylus cornuta* var. *californica* Shrubland Alliance (Hazelnut Scrub) (37.950.00)	S2?	Coastal Scrub

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
		Northern (Franciscan) Coastal Scrub (32100)	*Holodiscus discolor* Shrubland Alliance (Oceanspray Scrub) (39.100.00)	S3	
Poison Oak Series	459.88 (+0.60 on serpentine)	Poison Oak Chaparral (37F00) Serpentine Chaparral (37600)	*Toxicodendron diversilobum* Shrubland Alliance (Poison Oak Scrub) (37.940.00)	BHS when on serpentine	Coastal Scrub
Chaparral					
Big Berry Manzanita Series	439.48 (+94.97 on serpentine)	Northern Mixed Chaparral (37110) Serpentine Chaparral (37600)	*Arctostaphylos glauca* Shrubland Alliance (Bigberry Manzanita Chaparral) (37.301.00)	BHS when on serpentine	Chaparral
Birch-leafed Mountain Mahogany - Mesic Chaparral Mapping Unit	1,944.83 (+45.82 on serpentine)	Mesic North Slope Chaparral (37E00)	*Cercocarpus montanus* Shrubland Alliance (Birch Leaf Mountain Mahogany Chaparral) (76.100.00)	BHS when on serpentine	Chaparral
Bitter Cherry series (field verification only)	0.73	Mixed Montane Chaparral (37510) Mesic North Slope Chaparral (37E00)	*Prunus emarginata* Provisional Shrubland Alliance (Bitter Cherry Thickets) (37.900.00)	--	Chaparral
Blue Blossom – Jimbrush Mapping Unit	42.23	Blue Blossom Chaparral (37820) Mesic North Slope Chaparral (37E00)	*Ceanothus* (*oliganthus, tomentosus*) Shrubland Alliance (Hairy Leaf – Woolly Leaf Ceanothus Chaparral) (37.207.00)	S3	Chaparral
			Ceanothus thyrsiflorus Shrubland Alliance (Blue Blossom Chaparral) (37.204.00)	--	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Brittleleaf Manzanita Mapping Unit	2.93	Northern Maritime Chaparral (37C10)	*Arctostaphylos crustacea* Shrubland Alliance (Brittle Leaf Manzanita Chaparral) (37.308.00)	S3	Chaparral
Chamise - California Sagebrush Series	6.76	Chamise Chaparral (37200)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	--	Chaparral
			Artemisia californica Sagebrush Scrub Alliance (California Sagebrush Scrub) (32.010.00)	BHS when on serpentine	
Chamise - Leather Oak - (Garrya) - Serpentine Mapping Unit	9.92 (all on serpentine)	Chamise Chaparral (37200) Serpentine Chaparral (37600) Leather Oak Chaparral (37620)	*Adenostoma fasciculatum* Serpentine Shrubland Association (Serpentine Chamise Chaparral) (37.101.15)	S3	Chaparral
			Quercus durata Shrubland Alliance (Leather Oak Chaparral) (37.405.00)	--	
Chamise - Mixed Manzanita Multiple Series Mapping Unit	2,815.41 (+49.81 on serpentine)	Chamise Chaparral (37200) Northern Maritime Chaparral (37C10)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	BHS when on serpentine	Chaparral
			Arctostaphylos crustacea Shrubland Alliance (Brittle Leaf Manzanita Chaparral) (37.308.00)	S3 / BHS when on serpentine	
Chamise - Mixed Oak Multiple Series Mapping Unit	241.40 (+8.27 on serpentine)	Chamise Chaparral (37200) Northern Mixed Chaparral (37110)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	BHS when on serpentine	Chaparral
			Quercus spp. Forest & Woodland Alliance (Mixed Oak Forest and Woodland) (71.100.00)	BHS when on serpentine	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Chamise - Wedge-leaf Ceanothus Series	182.83 (+0.28 on serpentine)	Chamise Chaparral (37200) Northern Mixed Chaparral (37110)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	BHS when on serpentine	Chaparral
			Ceanothus cuneatus Shrubland Alliance (Wedge Leaf Ceanothus Chaparral) (37.211.00)	BHS when on serpentine	
Chamise – Woolly leaf Manzanita Series	75.86	Chamise Chaparral (37200) Northern Maritime Chaparral (37C10)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	BHS when on serpentine	Chaparral
			Arctostaphylos (*crustacea, tomentosa*) Shrubland Alliance (Brittle Leaf – Woolly Leaf Manzanita Chaparral)	S3	
Chamise Chaparral Series	1,847.00 (+26.41 on serpentine)	Chamise Chaparral (37200)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	BHS when on serpentine	Chaparral
Chaparral - Coastal Scrub Transition (Manzanita spp. - Blue-blossom)	827.92	Blue Brush Chaparral (37820) Northern Maritime Chaparral (37C10) Northern Mixed Chaparral (37110)	*Arctostaphylos* (*crustacea, tomentosa*) Shrubland Alliance (Brittle Leaf – Woolly Leaf Manzanita Chaparral)	S3	Chaparral Coastal Scrub
			Ceanothus thyrsiflorus Shrubland Alliance (Blue Blossom Chaparral) (37.204.00)	--	
Giant Chinquapin	3.92	Bush Chinquapin Chaparral (37550)	*Chrysolepis chrysophylla* Shrubland Alliance (Golden Chinquapin Thickets) (37.417.00)	S2	Chaparral Coastal Scrub

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Interior Live Oak - Manzanita spp. (Kings Mountain Manzanita) Mapping	0.65	Interior Live Oak Woodland (71150) Northern Maritime Chaparral (37C10)	*Quercus wislizenii* Forest & Woodland Alliance (Interior Live Oak Woodland and Forest) (71.080.00)	--	Cismontane Woodland
Manzanita - Mixed Oak Multiple Series Mapping Unit	336.78 (+1.32 on serpentine)	Northern Maritime Chaparral (37C10)	*Arctostaphylos* (*crustacea*, *tomentosa*) Shrubland Alliance (Brittle Leaf – Woolly Leaf Manzanita Chaparral)	S3	Chaparral
			Quercus spp. Forest & Woodland Alliance (Mixed Oak Forest and Woodland) (71.100.00)	BHS when on serpentine	
Mixed Xeric Chaparral (Chamise - Sticky Monkey flower - Toyon – Sagebrush)	431.12	Chamise Chaparral (37200) Northern Mixed Chaparral (37110)	*Adenostoma fasciculatum* Shrubland Alliance (Chamise Chaparral) (37.101.00)	--	Chaparral
			Artemisia californica Sagebrush Scrub Alliance (California Sagebrush Scrub) (32.010.00	BHS when on serpentine	
			Diplacus aurantiacus Shrubland Alliance (Bush Monkeyflower Scrub) (32.082.00)	S3?	
			Prunus ilicifolia Heteromeles arbutifolia – *Ceanothus spinosus* Shrubland Alliance (Holly Leaf Cherry – Toyon – Greenbark Ceanothus Chaparral) (37.912.00)	--	
Scrub Oak - (Manzanita - Wedge-leaf Ceanothus - Chamise - Scrub Interior	508.65	Scrub Oak Chaparral (37900)	*Quercus berberidifolia* Shrubland Alliance (Scrub oak Chaparral) (37.407.00)	S3	Chaparral

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
			Quercus berberidifolia – Adenostoma fasciculatum Shrubland Alliance (Scrub oak – Chamise Chaparral) (37.409.00)	--	
Oak Savannah Woodland					
Blue Oak / California Annual Grasslands Association	12.32 (+0.39 on serpentine)	Blue Oak Woodland (71140) Non-Native Grassland (42200)	*Avena* spp. – *Bromus* spp. Herbaceous Semi-Natural Alliance (Wild Oats and Annual Brome Grasslands) (42.027.00)	--	Cismontane Woodland
			Quercus douglasii Forest & Woodland Alliance (Blue Oak Woodland and Forest) (71.020.00)	BHS	
Blue Oak Series	4.07	Blue Oak Woodland (71140)	*Quercus douglasii* Forest & Woodland Alliance (Blue Oak Woodland and Forest) (71.020.00)	BHS	Cismontane Woodland
Blue Oak Woodland Mapping Unit	38.93 (0.53 on serpentine)	Blue Oak Woodland (71140)	*Quercus douglasii* Forest & Woodland Alliance (Blue Oak Woodland and Forest) (71.020.00)	BHS	Cismontane Woodland
Valley Oak Woodland Series	68.98 (+1.20 on serpentine)	Valley Oak Woodland (71130)	*Quercus lobata* Forest & Woodland Alliance (Valley Oak Woodland and Forest) (71.040.00)	S3 / BHS when on serpentine	Cismontane Woodland
Hardwood Forest					
Black Oak / Madrone (Coast Live Oak) Mapping Unit	40.85	Black Oak Woodland (71120)	*Arbutus menziesii* Forest Alliance (Madrone Forest) (73.200.00)	S3.2 / BHS	Cismontane Woodland

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
		Coast Live Oak Woodland (71160)	*Quercus agrifolia* – *Quercus kelloggii* Forest & Woodland Association (Coast Live Oak – Black Oak Woodland and Forest) (71.060.18)	--	
			Quercus kelloggii Forest & Woodland Alliance (Black Oak Woodland and Forest) (71.010.00)	BHS	
Black Oak Mapping Unit	83.22 (+0.39 on serpentine)	Black Oak Woodland (71120)	*Quercus kelloggii* Forest & Woodland Alliance (Black Oak Woodland and Forest) (71.010.00)	BHS	Cismontane Woodland
California Bay - Canyon Live Oak Multiple Series Mapping Unit	4,610.32 (+64.86 on serpentine)	California Bay Forest (81200) Canyon Live Oak Forest (81320)	*Umbellularia californica* – *Quercus chrysolepis* Forest Association (California Bay and Canyon Live Oak Forest) (74.100.20)	S3? / BHS when on serpentine	Broadleaved Upland Forest
California Bay - Coast Live Oak Multiple Series Mapping Unit	2,340.98 (+68.46 on serpentine)	Coast Live Oak Woodland (71160) California Bay Forest (81200)	*Umbellularia californica* – *Quercus agrifolia* Forest Association (California Bay Forest) (74.100.00)	S3 / BHS when on serpentine	Broadleaved Upland Forest
California Bay Association	1,071.11 (+9.75 on serpentine)	California Bay Forest (81200)	*Umbellularia californica* Forest Alliance (California Bay Forest) (74.100.00)	S3 / BHS when on serpentine	Broadleaved Upland Forest
California Bay Forest Series	14.59	California Bay Forest (81200)	*Umbellularia californica* Forest Alliance (California Bay Forest) (74.100.00)	S3	Broadleaved Upland Forest
California Buckeye Series	323.78	Interior Live Oak Woodland (71150)	*Aesculus californica* Forest & Woodland Alliance (California Buckeye Groves) (75.100.00)	S3	Cismontane Woodland

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Coast Live Oak Series	2,716.89 (+22.35 on serpentine)	Coast Live Oak Woodland (71160)	*Quercus agrifolia* Woodland Alliance (Coast Live Oak Woodland) (71.060.00)	BHS when on serpentine	Cismontane Woodland
Higher Elevation Mixed Broadleaf Hardwoods	2,271.38	California Bay Forest (81200) Tanoak Forest (81400)	*Notholithocarpus densiflorus* Forest Alliance (Tanoak Forest) (73.100.00)	S3.2	Broadleaved Upland Forest
			Umbellularia californica Forest (California Bay Forest) (74.100.00)	S3	
Lower Elevation Mixed Broadleaf Hardwoods	3,864.78	California Bay Forest (81200) Tanoak Forest (81400)	*Notholithocarpus densiflorus* Forest Alliance (Tanoak Forest) (73.100.00)	S3.2	Broadleaved Upland Forest
			Umbellularia californica Forest Alliance (California Bay Forest) (74.100.00)	S3	
Mixed Oak Mapping Unit	231.58	California Bay Forest (81200) Coast Live Oak Forest (81310)	*Quercus* sp. Forest & Woodland Alliance (Mixed Oak Woodland and Forest) (71.100.00)	BHS	Cismontane Woodland
Tanoak - (California Bay) Multiple Series Mapping Unit	834.68	Tanoak Forest (81400)	*Notholithocarpus densiflorus – Umbellularia californica* Forest Association (Tanoak - California Bay Forest) (73.100.19)	S3	Broadleaved Upland Forest Cismontane Woodland
Temperate Broadleaf Sclerophyll Evergreen Forests	2.93	California Bay Forest (81200)	*Umbellularia californica* Forest Alliance (California Bay Forest) (74.100.00)	S3	Broadleaved Upland Forest

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation Name	California Vegetation Designation [d]	CNPS Inventory [e]
Conifer Forest					
Douglas-fir - / Mixed Hardwoods Mapping Unit	5,455.03	Mixed Evergreen (81100) Upland Douglas Fir Forest (82420)	*Pseudotsuga menziesii – Notholithocarpus densiflorus* Forest & Woodland Association (Douglas Fir – Tanoak Forest and Woodland) (82.500.00)	S3 / BHS when on serpentine	North Coast Coniferous Forest
			Pseudotsuga menziesii – Quercus agrifolia Forest & Woodland Association (Douglas Fir – Coast Live Oak Forest and Woodland) (82.200.71)	S3? / BHS when on serpentine	
			Pseudotsuga menziesii – Umbellularia californica Forest & Woodland Association (Douglas Fir – California Bay Forest and Woodland) (82.200.66)	--	
Douglas-fir - California Bay Association	829.68 (+37.43 on serpentine)	Mixed Evergreen (81100) Upland Douglas Fir Forest (82420)	*Pseudotsuga menziesii – Umbellularia californica* Forest & Woodland Association (Douglas Fir – California Bay Forest and Woodland) (82.200.66)	BHS when on serpentine	North Coast Coniferous Forest
Douglas-fir - Coast Redwood Association	2,017.79	Mixed Evergreen (81100)	*Sequoia sempervirens – Pseudotsuga menziesii – Notholithocarpus densiflorus* Forest & Woodland Association (Redwood – Douglas Fir – Tanoak Forest and Woodland) (86.100.31)	S?	North Coast Coniferous Forest

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
			Sequoia sempervirens – Pseudotsuga menziesii – Umbellularia californica Forest & Woodland Alliance (Redwood – Douglas Fir – California Bay Forest and Woodland) (86.100.20)	S?	
Douglas-fir - Chinquapin Association	43.75	Mixed Evergreen (81100)	*Pseudotsuga menziesii / Chrysolepis chrysophylla – Notholithocarpus densiflorus* Forest Association (Douglas Fir and Giant Chinquapin) (82.200.12)	S3	North Coast Coniferous Forest
Douglas-fir Forest Series	166.93	Upland Douglas Fir Forest (82420)	*Pseudotsuga menziesii* Forest & Woodland Alliance (Douglas Fir Forest and Woodland) (82.200.00)	--	North Coast Coniferous Forest
Foothill Pine / Big Berry Manzanita Association	76.89 (+15.98 on serpentine)	Non-serpentine Gray Pine Chaparral Woodland (71322) Open Gray Pine Woodland (71310) Serpentine Gray Pine-Chaparral Woodland (71321)	*Arctostaphylos glauca* Shrubland Alliance (Bigberry Manzanita Chaparral) (37.301.00)	BHS when on serpentine	Cismontane Woodland
			Pinus sabiniana Woodland Alliance (Foothill Pine Woodland) (87.130.00)	BHS when on serpentine	
Foothill Pine - Canyon Live Oak Association	49.85 (+0.11 on serpentine)	Canyon Live Oak Forest (81320) Open Gray Pine Woodland (71310)	*Pinus sabiniana* Woodland Alliance (Foothill Pine Woodland) (87.130.00)	BHS when on serpentine	Cismontane Woodland
			Quercus chrysolepis Forest & Woodland Alliance (Canyon Live Oak Forest and Woodland) (71.050.00)	BHS when on serpentine	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Foothill Pine Series	22.70	Open Gray Pine Woodland (71310) Serpentine Digger Pine-Chaparral Woodland (71321)	*Pinus sabiniana* Woodland Alliance (Foothill Pine Woodland) (87.130.00)	BHS when on serpentine	Cismontane Woodland
Knobcone Pine Series	422.33 (+18.13 on serpentine)	Knobcone Pine Forest (83210)	*Pinus attenuata* Forest Alliance (Knobcone Pine Forest) (87.100.00)	BHS when on serpentine	Closed Cone Coniferous Forest
Redwood / Tanoak Association	4,188.72	Upland Redwood Forest (82320)	*Sequoia sempervirens* – *Notholithocarpus densiflorus* – *Vaccinium ovatum* Forest Association (Redwood – Tanoak – Huckleberry Forest) (86.100.16)	S3	North Coast Coniferous Forest
Redwood Forest Series	659.71	North Coast Alluvial Redwood Forest (61120) Upland Redwood Forest (82320)	*Sequoia sempervirens* Forest Alliance (Redwood Forest) (86.100.00)	S3	North Coast Coniferous Forest
Riparian					
Arroyo Willow (Arroyo willow identified as dominant component	318.49	Central Coast Riparian Scrub (63200)	*Salix lasiolepis* Thickets Alliance (Arroyo Willow Thickets) (61.2010.00)	S?	Riparian Scrub
Big-leaf Maple Series	218.75 (+2.49 on serpentine)	North Coast Riparian Forests (61100)	*Acer macrophyllum* Forest Alliance (Bigleaf Maple Forest) (61.450.00)	S3 / BHS	Riparian Forest
Box Elder Series	0.85	North Coast Riparian forests (61100)	*Acer negundo* Forest Alliance (Box-elder Forest) (61.440.00)	S2 / BHS	Riparian Forest

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
California Sycamore Series	7.70	Sycamore Alluvial Woodland (62100)	*Platanus racemosa* Woodland Alliance (California Sycamore Woodland) (61.310.00)	S3 / BHS	Riparian Forest
Mixed Willow Series Mapping Unit (contains Arroyo Willow, Red Willow)	83.07	Central Coast Riparian Scrub (63200)	*Salix laevigata – Salix lasiolepis* Riparian Woodland Association (Arroyo Willow – Red Willow Riparian Woodland) (61.205.02)	S3	Riparian Scrub
Red Alder Series (mixed willow)	279.49	Red Alder Riparian Forest (61130)	*Alnus rubra* Forest Alliance (Red Alder Forest) (61.410.00)	Potentially jurisdictional	Riparian Forest
White Alder Series	422.22 (+5.93 on serpentine)	White Alder Riparian Forest (61510)	*Alnus rhombifolia* Forest & Woodland Alliance (White Alder Groves) (61.420.00)	Potentially jurisdictional / BHS when on serpentine	Riparian Forest
Barren or Rock					
Landslides, Cliffs, Rock Outcrops	119.49 (+0.88 on serpentine)	Unvegetated (Not Described)	Not Described	BHS	Not Described
Degraded / Converted					
Agriculture	81.84	Agriculture (Not Described)	Not Described	--	Not Described
Christmas Tree Farm	23.26	Agriculture (Not Described)	Not Described	--	Not Described
Olive Groves	2.19	Agriculture (Not Described)	Not Described	--	Not Described

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Plantation Pines	1.48	Pine Plantation (Not Described)	*Pinus radiata* Semi-Natural Alliance (Monterey Pine Plantations) (87.240.04)	--	Not Described
Built-up / Urban Disturbance	244.76	Urban (Not Described)	Not Described	--	Not Described
Government Related Facilities	24.24	Urban (Not Described)	N/A	--	N/A
Land Use / Unvegetated	35.32	Unvegetated (Not Described)	Not Described	--	Not Described
Sparsely Vegetated or Unvegetated Areas	0.66	Unvegetated (Not Described)	Not Described	--	Not Described
Vegetation Restoration Sites	6.71 (+2.27 on serpentine)	Not Described	Not Described	--	Not Described

Notes:

It should be noted that Midpen's vegetation data set may be outdated, has not been entirely field verified, and may be inaccurate in some locations which is an inherent result when mapping at large scales.

[a] Midpen Vegetation Classifications (Midpen, 2018)

[b] Terrestrial Natural Communities of California (Holland, 1986).

[c] A Manual of California Vegetation (Sawyer et al. 2009) or List of Terrestrial Natural Communities (CDFW 2020).

[d] BHS: Biologically Highly Significant Community which are derived from Midpen's Conservation Atlas and current vegetation spatial dataset (Midpen, 2018; Midpen, 2014)
S-Ranks 1-3 are included and appear at the end of the California Vegetation name. These ranks indicate Sensitive Natural Community status (CDFW, 2019). A rank of S1 indicates a vegetation alliance or association as "Critically Imperiled" because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction (NatureServe 2020). A rank of S2 indicates a vegetation alliance or association as "Imperiled" because of rarity due to very restricted range, few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction (NatureServe 2020). A rank of S3 indicates a vegetation alliance or association is "Vulnerable," meaning it is at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors (NatureServe 2020). A rank of S? denotes that although insufficient samples exist for the full expected range of a community.

[e] CNPS Inventory of Rare and Endangered Plants of California Habitat Types (CNPS 2020).

Table 2 Aquatic Vegetation Communities Found on Midpen Lands and Potential for Sensitive Communities to Occur

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Wetland					
Bulrush Series	0.35	Coastal and Valley Freshwater Marsh (52410)	*Schoenoplectus* (*acutus, californicus*) Herbaceous Alliance (Hardstem and California Bulrush Marshes) (52.128.00)	S3	Marshes and Swamps
Cattail Series	7.23	Coastal and Valley Freshwater Marsh (52410)	*Typha* (*angustifolia, domingensis, latifolia*) Herbaceous Alliance (Cattail Marshes) (52.050.00)	--	Marshes and Swamps
Meadow Barley Series	4.27	Coastal and Valley Freshwater Marsh (52410)	*Hordeum brachyantherum* Herbaceous Alliance (Meadow Barley Patches) (42.052.00)	S2 / BHS	Meadows and Seeps
Sedge - Juncus Meadow Mapping Unit	9.03	Coastal and Valley Freshwater Marsh (52410)	*Carex nudata* Herbaceous Alliance (Torrent Sedge Patches) (45.182.00)	S2? / BHS	Marshes and Swamps
			Juncus arcticus (var. *balticus, mexicanus*) Herbaceous Alliance (Baltic and Mexican Rush Marshes) (45.562.00)	BHS	
			Juncus patens Herbaceous Alliance (Western Rush Marshes) (45.564.00)	BHS	
			Juncus (*oxymeris, xiphioides*) Provisional Herabceous Alliance (Iris-Leaf Rush Seeps) (45.568.00)	S2? / BHS	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Undifferentiated Marsh (cattail, bulrush), Permanent Freshwater Marsh, & Wetland	182.00	Coastal and Valley Freshwater Marsh (52410)	*Schoenoplectus* (*acutus, californicus*) Herbaceous Alliance (Hardstem and California Bulrush Marshes) (52.128.00)	S3	Marshes and Swamps
			Typha (*angustifolia, domingensis, latifolia*) Herbaceous Alliance (Cattail Marshes) (52.050.00)	--	
			Water		
Reservoirs	4.57	Not Described	*Azolla* (*filiculoides, microphylla*) Herbaceous Alliance (Mosquito Fern Mats) (52.106.00)	BHS	Not Described
			Hydrilla verticillata – Myriophyllum spicata Herbaceous Alliance (Ruderal Water-Thyme – Eurasian Water Milfoil Aquatic) (52.127.00)	BHS	
			Lemna (minor) and Relatives Provisional Herbaceous Alliance (Duckweed Blooms) (52.105.00)	BHS	
			Ludwigia (*hexapetala, peploides*) Provisional Herbaceous Semi-Natural Alliance (Water Primrose Wetlands) (52.118.00)	BHS	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	
Small Ephemeral Ponds	23.44	Not Described	*Lemna* (minor) and Relatives Provisional Herbaceous Alliance (Duckweed Blooms) (52.105.00)	BHS	Not Described
			Azolla (*filiculoides, microphylla*) Herbaceous Alliance (Mosquito Fern Mats) (52.106.00)	BHS	
Water	89.26	Not Described	*Azolla* (*filiculoides, microphylla*) Herbaceous Alliance (Mosquito Fern Mats) (52.106.00)	BHS	Not Described
			Hydrilla verticillata – Myriophyllum spicata Herbaceous Alliance (Ruderal Water-Thyme – Eurasian Water Milfoil Aquatic) (52.127.00)	BHS	
			Lemna (minor) and Relatives Provisional Herbaceous Alliance (Duckweed Blooms) (52.105.00)	BHS	
			Ludwigia (*hexapetala, peploides*) Provisional Herbaceous Semi-Natural Alliance (Water Primrose Wetlands) (52.118.00)	BHS	

Midpen Types [a,b]	Area (Acres)	Terrestrial Communities [c]	California Vegetation		CNPS Inventory [e]
			Name	Designation [d]	

Notes:

It should be noted that Midpen's vegetation data set may be outdated, has not been entirely field verified, and may be inaccurate in some locations which is an inherent result when mapping at large scales.

[a] Midpen Vegetation Classifications (Midpen, 2018).

[b] Terrestrial Natural Communities of California (Holland, 1986).

[c] A Manual of California Vegetation (Sawyer et al. 2009) or California Natural Communities List (CDFW, 2019).

[d] BHS: Biologically Highly Significant Community which are derived from Midpen's Conservation Atlas and current vegetation spatial dataset (Midpen 2014; Midpen 2020).
S-Ranks 1-3 are included and appear at the end of the California Vegetation name. These ranks indicate Sensitive Natural Community status (CDFW, 2019). A rank of S1 indicates a vegetation alliance or association as "Critically Imperiled" because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction (NatureServe 2020). A rank of S2 indicates a vegetation alliance or association as "Imperiled" because of rarity due to very restricted range, few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction (NatureServe 2020). A rank of S3 indicates a vegetation alliance or association is "Vulnerable," meaning it is at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors (NatureServe 2020). A rank of S? denotes that although insufficient samples exist for the full expected range of a community.

[e] CNPS Inventory of Rare and Endangered Plants of California Habitat Types (CNPS 2020).

Appendix 4.4b Special-Status Species Tables

Special Status Species Tables

The tables below have local distribution references using the CNDDB Element Occurrence Index (EONDX) number (CNDDB 2020). The EONDX is an integer (unique for each record) used within the CNDDB for its GIS relational databases. Factors influencing which determination category are applied to target species are detailed below.

- None denotes a complete lack of habitat suitability, local range restrictions, and/or regional extirpations.
- Not Expected denotes situations where partial habitat elements may be present but are of poor quality or is isolated from the nearest extant occurrences. Incomplete habitat elements refer to a lack of one or more of the following: appropriate elevation, preferred geology, preferred soil chemistry and type, suitable vegetation communities, or necessary microhabitats. The site conditions may also be degraded or significantly altered. These factors create unsuitable ecological conditions for the consideration of even a low occurrence potential within the Program area, therefore they are not considered to have a potential to occur.
- Possible indicates the presence of suitable habitat or key habitat elements that potentially support a specific species or taxa.
- Present indicates the target species occurs within Potential or Existing Treatment areas based on GIS analysis.

Table 3 Special-Status Plant Species Known to Occur or Potentially Occurring on Midpen Lands

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Federal/State Endangered or Threatened and California Rare Species					
Acanthomintha duttonii San Mateo thorn-mint	Fed: FE CA: SE CEQA:1B.1	Occurs on serpentine in chaparral and valley and foothill grassland. Known only from SMT County between 50-300 meters from only five occurrences.	April-June annual herb	Although suitable vegetation associations and substrates are present this species is highly restricted to the serpentine around Crystal Springs Reservoir. There is one CNDDB occurrence recorded nearby the Program Area. CNDDB occurrence EONDX #18110 is a specific location in Edgewood County Park.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Ceanothus ferrisiae Coyote ceanothus	Fed: FE CA: CEQA CEQA: 1B.1 Other: SCVHP	Occurs on serpentine in chaparral, coastal scrub, and valley and foothill grassland. Known only from SCL County between 120-460 meters from only four occurrences.	January-May perennial shrub (evergreen)	Although suitable vegetation associations and substrates are present this species is highly restricted to the serpentine east of Sierra Azul. The nearest recorded CNDDB occurrence (EONDX #1378) is a non-specific location in Croy Canyon approximately 3 miles east of Sierra Azul OSP. This record is based on a historic collection that could have been erroneously identified.	Not Expected
Chorizanthe pungens var. hartwegiana Ben Lomond spineflower	Fed: FE CA: CEQA CEQA: 1B.1	Occurs in maritime ponderosa pine sandhills of lower montane coniferous forest. Known only from SCR County between 90-610 meters.	April-July annual herb	No suitable vegetation associations or sandy substrate present. This species is also restricted to the locations west of the Santa Cruz Mountains crest. The nearest recorded CNDDB occurrence (EONDX #8011) is a non-specific location in the vicinity of Glenwood approximately 2 miles southwest of Sierra Azul OSP. This record is possibly extirpated.	None
Chorizanthe pungens var. pungens Monterey spineflower	Fed: FT CA: None CEQA: 1B.2	Occurs on sandy soils in maritime chaparral, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland. Known from MNT and SCR counties between 3-450 meters. Presumed extirpated from SLO County.	April-June annual herb	No suitable vegetation associations or sandy substrate present. This species is also restricted to the locations west of the Santa Cruz Mountains crest. The nearest recorded CNDDB occurrence (EONDX #29626) is a specific location at the northwest end of Pleasant Valley, 5 miles south of Sierra Azul OSP.	None
Chorizanthe robusta var. hartwegii Scotts Valley spineflower	Fed: FE CA: None CEQA: 1B.1	Occurs in sandy meadows and seeps and on mudstone and Purisima outcrops of valley and foothill grassland. Known only from SCR county between 230-245 meters from only four occurrences.	April-July annual herb	No suitable vegetation associations or sandy substrate present. This species is also restricted to the locations west of the Santa Cruz Mountains crest. The nearest recorded CNDDB occurrence (EONDX #7271) is a specific location in Scotts Valley 5.6 miles southwest of Sierra Azul OSP.	None

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Chorizanthe robusta var. robusta robust spineflower	Fed: FE CA: None CEQA: 1B.1	Occurs in sandy or gravelly soils in maritime chaparral, openings of cismontane woodland, coastal dunes, and coastal scrub. Known from MNT, SCR, and SFO counties between 3-300 meters. Potentially found in MRN county. Presumed extirpated from ALA, SCL, and SMT counties.	April-September annual herb	Although suitable vegetation associations are present within the Program Area this species prefers sandy soils closer to the coast, bayside, or riverine environments. There is one CNDDB occurrence recorded nearby the Program Area at El Sereno OSP and St. Joseph's Hill OSP. CNDDB occurrence EONDX #22582 is a non-specific location in the general vicinity of Los Gatos that is based on a historical collection and is likely extirpated.	Not Expected
Cirsium fontinale var. fontinale Crystal Springs fountain thistle	Fed: FE CA: SE CEQA: 1B.1	Occurs on serpentine seeps in openings of chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland. Known only from SMT County between 45-175 meters. Known from only five occurrences in the vicinity of Crystal Springs Reservoir.	May-October perennial herb	Although suitable vegetation associations and substrates are present this species is highly restricted to the serpentine around Crystal Springs Reservoir. One CNDDB occurrence is recorded nearby the Program Area. CNDDB occurrence EONDX #4492 is a specific location at the south end of Edgewood County Park that is possibly extirpated. Pulgas Ridge OSP is not mapped as including serpentine.	Not Expected
Dudleya abramsii subsp. setchellii Santa Clara Valley dudleya	Fed: FE CA: None CEQA: 1B.1 Other: SCVHP	Occurs on serpentine, rocky soils in cismontane woodland and valley and foothill grassland. Known only from SCL County between 60-455 meters.	April-October perennial herb	Suitable vegetation associations and serpentine habitat are present within the Program Area. There are two CNDDB occurrences recorded within Sierra Azul OSP. CNDDB occurrences EONDX #94251 and 94250 are specific locations approximately 0.6 mile south and 0.6 mile WSW of Guadalupe Dam. This taxon possibly occurs in treatment areas within Sierra Azul OSP. on serpentine grassland. It occupies rock outcrops and serpentine barrens that do not carry fire well.	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Eriophyllum latilobum San Mateo woolly sunflower	Fed: FE CA: SE CEQA: 1B.1	Occurs in cismontane woodland on road cuts and often serpentine, coastal scrub, and lower montane coniferous forest. Known only from SMT County between 45-330 meters. Specimens from NAP county need verification.	May-June perennial herb	Suitable vegetation associations and substrates present within the Program Area. It is suspected that this species is a pyrophyte. There is one CNDDB occurrence recorded within the Program Area at Russian Ridge and Coal Creek OSPs. CNDDB occurrence EONDX #63072 is a non-specific area along Highway 35, 9 miles north of Saratoga Summit. The occurrence noted above is from the 1960s and has not been reported since. It is likely this occurrence extirpated however, it possibly occurs in treatment areas that support oak woodland habitat providing partial shade in the vicinity of Coal Creek OSP and Russian Ridge OSP. This species is presumed to be of hybrid origin between two fire adapted Eriophyllum species, therefore this species could benefit from burning or opening closed canopy woodlands.	Possible
Erysimum teretifolium Santa Cruz wallflower	Fed: FE CA: SE CEQA: 1B.1	Occurs on inland marine sands in chaparral and lower montane coniferous forest. Known only from SCR County between 120-610 meters.	March-July perennial herb	No suitable vegetation associations or sandy substrate present. This species is also restricted to the locations west of the Santa Cruz Mountains crest. The nearest recorded CNDDB occurrence (EONDX #8009) is a non-specific location in the vicinity of Glenwood approximately 2.1 miles southwest of Sierra Azul OSP. This occurrence is possibly extirpated.	None
Hesperocyparis abramsiana var. abramsiana Santa Cruz cypress	Fed: FT CA: SE CEQA: 1B.2	Occurs on sandstone or granitic soils in closed-cone coniferous forest, chaparral, and lower montane coniferous forest. Known only from SCR County between 280-	perennial tree (evergreen)	Although suitable vegetation associations and substrate are present this species is restricted to areas of northwestern Santa Cruz County. The nearest CNDDB occurrence (EONDX #14440) is a	Not expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		800 meters from only seven occurrences.		specific location in Bracken Brae Grove 6.6 miles west of Bear Creek Redwoods OSP.	
Hesperocyparis abramsiana var. butanoensis Butano Ridge cypress	Fed: FT CA: SE CEQA: 1B.2	Occurs on sandstone soils in closed-cone coniferous forest, chaparral, and lower montane coniferous forest. Known only from one occurrence on Butano Ridge of the Santa Cruz Mountains between 400-490 meters.	perennial tree (evergreen)	Although suitable vegetation associations and substrate are present this species is restricted to a small area in southern San Mateo County The nearest CNDDB occurrence (EONDX #86559) is a specific location on the southwest-facing slope of Butano Ridge, 4.1 miles south of Russian Ridge OSP.	Not Expected
Hesperolinon congestum Marin western flax	Fed: FT CA: ST CEQA: 1B.1	Occurs on serpentine in chaparral and valley and foothill grassland. Protected in part at Ring Mountain Preserve in Marin County. Known from MRN, SFO, and SMT counties between 5-370 meters.	April-July annual herb	Although suitable vegetation associations and substrates are present this species is highly restricted to the serpentine around Crystal Springs Reservoir and Edgewood. Two CNDDB occurrences are recorded near the Program Area. CNDDB occurrences EONDX #7809 and 20708 are specific locations at Edgewood County Park. Pulgas Ridge OSP is not mapped as including serpentine.	Not Expected
Holocarpha macradenia Santa Cruz tarplant	Fed: FT CA: SE CEQA: 1B.1	Occurs on sandy, often clay soils in coastal prairie, coastal scrub, and valley and foothill grassland. Known from MNT, SCR, and SOL counties between 10-220 meters. Presumed extirpated from ALA, CCA, and MRN counties.	June-October annual herb	Although suitable vegetation associations and substrates are present within the Program Area, locally this species is restricted to the immediate Santa Cruz coast. The nearest CNDDB occurrence (EONDX #7435) is a specific location adjacent to the former Monterey Bay Heights golf course 7.1 miles south of Sierra Azul OSP.	Not Expected
Pedicularis dudleyi Dudley's lousewort	Fed: None CA: SR CEQA: 1B.2	Occurs in maritime chaparral, cismontane woodland, North Coast coniferous forest, and valley and foothill grassland. Known from MNT, SLO, and SMT counties	April-June perennial herb	Suitable vegetation associations present. The nearest recorded CNDDB occurrence (EONDX #748) is a specific location 1.2 miles southwest of the Program Area, in Portola Redwoods State Park. This taxon possibly occurs in Treatment areas that support redwood forests on the west slope of the	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		between 60-900 meters. Presumed extirpated from SCR County.		Santa Cruz Mountains crest between Long Ridge OSP and La Honda Creek OSP. This species germinates on bare mineral soil but prefers full shade of a closed canopy. Therefore, vegetation management or prescribed fire activities could benefit this species.	
Pentachaeta bellidiflora white-rayed pentachaeta	Fed: FE CA: SE CEQA: 1B.1	Occurs in cismontane woodland and valley and foothill grassland often on serpentine. Currently only known from SMT County between 35-620 meters. Presumed extirpated from MRN and SCR counties.	March-May annual herb	Although suitable vegetation associations and substrates are present this species is highly restricted to the serpentine around Crystal Springs Reservoir and Edgewood. One CNDDB occurrence is recorded near the Program Area. CNDDB occurrence #27386 is a specific location in Edgewood Triangle and Edgewood County Park.	Not Expected
Plagiobothrys diffusus San Francisco popcornflower	Fed: None CA: SE CEQA: 1B.1	Occurs in coastal prairie and valley and foothill grassland. Known from ALA, SBT, SCR, and SMT counties between 60-360 meters. Presumed extirpated from SFO County.	March-June annual herb	Although suitable vegetation associations and substrates are present within the Program Area, however locally this species is restricted to the immediate Santa Cruz coast. The nearest recorded CNDDB occurrence (EONDX #7437) is a specific location in northern Scotts Valley at "Santa's Village", 5.6 miles southwest of Sierra Azul OSP.	Not Expected
Polygonum hickmanii Scotts Valley polygonum	Fed: FE CA: SE 1B.1	Occurs in valley and foothill grassland on mudstone and sandstone soils. Known only from Scotts Valley in SCR County between 210-250 meters from only two occurrences. Not in TJM.	May-August annual herb	No suitable vegetation associations or sandy substrate present within the Program Area. This species is also restricted to the locations west of the Santa Cruz Mountains crest. The nearest recorded CNDDB occurrence (EONDX #31214) is a specific location in northern Scotts Valley at "Santa's Village" 5.6 miles southwest of Sierra Azul OSP.	None
Sanicula saxatilis rock sanicle	Fed: None CA: SR CEQA: 1B.2	Occurs on rocky, scree, and talus substrates in broadleafed upland forest, chaparral, and valley and	April-May perennial herb	Suitable vegetation associations and substrate present. There is one CNDDB occurrence within the Program Area at Sierra Azul OSP. CNDDB	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		foothill grassland. Known from CCA and SCL counties between 620-1,175 meters from only nine occurrences.		occurrence EONDX #114463 is a specific location on the east slope of Mount Umunhum and upper Guadalupe Canyon. This taxon possibly occurs in Treatment areas that are dominated by scree and talus on ridgetops and peaks of Sierra Azul OSP. These scree and talus habitats do not carry fire.	
Streptanthus albidus subsp. albidus Metcalf Canyon jewelflower	Fed: FE CA: None CEQA: 1B.1 Other: SCVHP	Occurs in valley and foothill grassland on serpentine soils. Known only from SCL County between 45-800 meters.	April-July annual herb	Although suitable vegetation associations and substrates are present in the Program Area this taxon has a narrow distribution that ends near New Almaden. The nearest recorded CNDDB occurrence (EONDX #25391) is a specific location on the ridge north of Danna Rock Park in San Jose 6 miles northeast of Sierra Azul OSP.	Not Expected
Suaeda californica California seablite	Fed: FE CA: None CEQA: 1B.1	Occurs in coastal salt marshes and swamps. Known from ALA, SCL, SFO, and SLO counties between 0-15 meters. Presumed extirpated from CCA county.	July-October shrub (evergreen)	Although suitable vegetation associations are present within the Program Area, Treatments are not anticipated in these habitats. The nearest recorded CNDDB occurrence (EONDX #6725) is a non-specific location on the salt flats of Palo Alto Yacht Harbor approximately 1.3 miles south of Stevens Creek Shoreline Nature Study Area. This occurrence is based on a historical collection and is likely extirpated.	Not Expected
Trifolium amoenum two-fork clover	Fed: FE CA: None CEQA: 1B.1	Occurs in coastal bluff scrub and valley and foothill grassland that can be serpentinitic. Rediscovered in 1993. Currently known from MRN and SMT counties. Presumed extirpated from NAP, SCL, SOL, and SON counties. Has been recorded from 5-415 meters.	April-June annual herb	Although suitable vegetation associations and substrates are present this taxon is known from lower elevations in the northern part of San Mateo County. The nearest recorded CNDDB occurrence (EONDX #84558) is a non-specific location at San Francisquito Creek near Searsville Lake 1 mile east of Thornewood. This occurrence is based on a historic collection.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Trifolium polyodon Pacific Grove clover	Fed: None CA: SR CEQA: 1B.1	Occurs on mesic, sometimes granitic substrates in closed-cone coniferous forest, coastal prairie, meadows and seeps, and valley and foothill grassland. Known from MNT, MRN, SCR, and SON counties between 5-425 meters.	April-June annual herb	Although suitable vegetation associations and substrates are present this taxon is known from lower elevations in the western part of Santa Cruz County. The nearest recorded CNDDB occurrence (EONDX #113542) is a specific location on Glenwood Preserve 5.7 miles southwest of Sierra Azul OSP.	Not Expected
California Native Plant Society Listed and Locally Rare Species					
Allium peninsulare var. franciscanum Franciscan onion	Fed: None CA: None CEQA: 1B.2	Occurs on clay, volcanic, and most often serpentine sites in cismontane woodland and valley and foothill grassland. Known from MEN, NAP, SCL, SMT and SON counties between 52-305 meters.	May-June perennial herb (bulbiferous)	Vegetation associations and preferred substrates present with in the Program Area. There are four CNDDB occurrences recorded within the Program Area. CNDDB occurrences EONDX #94479 and #94481 are specific locations on Pulgas Ridge OSP near the Dusky-Footed Woodrat trail and along the Polly Geraci trail, respectively. CNDDB occurrences EONDX #94483 and 110308 are specific locations in Edgewood Park. The occurrence in Pulgas Ridge OSP is located within a Potential Treatment area and possibly occurs in other treatment areas that primarily supports intermittent canopy woodlands near grasslands east of Highway 35 and north of Portola Valley. This species prefers partial shade habitats but may not persist when canopies close.	Present and Possible
Amsinckia lunaris bent-flowered fiddleneck	Fed: None CA: None CEQA: 1B.2	Occurs in coastal bluff scrub, cismontane woodland and valley and foothill grassland. Many collections are old. Known from ALA, CCA, COL, LAK, MRN, NAP, SBT, SCL, SCR, SMT SON, SUT, and	March-June annual herb	Suitable vegetation associations are present within the Program Area. The nearest recorded CNDDB occurrence (EONDX #109708) is a specific location on Limekiln trail just south of St. Joseph's Hill OSP. This taxon possibly occurs in Treatment areas that provide grassland ecotones with the other vegetation types listed on the west slope of the	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		YOL counties between 3-500 meters.		Santa Cruz Mountains from St. Joseph's Hill OSP north. This species prefers to be on the margin of grassland and scrub or woodland. Changes in vegetation structure, such as scrub encroachment or removal, could be detrimental.	
Androsace elongata subsp. acuta California androsace	Fed: None CA: None CEQA: 4.2	Occurs in chaparral, cismontane woodland, coastal scrub, meadows and seeps, pinyon and juniper woodland, and valley and foothill grassland. Known from ALA, CCA, COL, FRE, GLE, KRN, LAX, MER, RIV, SBD, SBT, SCL, SDG, SIS, SJQ, SLO, SMT, STA, and TEH counties between 150-1,305 meters.	March-June annual herb	Suitable vegetation associations are present within the Program Area. The nearest herbarium record is a McMurphy collection (Accession #CAS-BOT-BC-46952) from Page Mill Rd. about 3 miles east of Windy Hill OSP. This taxon possibly occurs in Treatment areas that support a variety of habitats but typically occur in areas with very little vegetative cover nearby rock outcrops in the vicinity of Windy Hill OSP. These are habitats that do not carry fire well.	Possible
Anomobryum julaceum slender silver moss	Fed: None CA: None CEQA: 4.2	Occurs on damp rock and soil on outcrops, usually on roadcuts in broadleafed upland forest, lower montane coniferous forest, and North Coast coniferous forest. Known from BUT, CCA, HUM, LAX, MPA, SBA, SCR, SHA, and SON counties between 100-1,000 meters.	moss	Although suitable vegetation associations are present this species is locally distributed to the western part of Santa Cruz County. The nearest recorded CNDDB occurrence (EONDX #45371) is a non-specific location in Big Basin Redwoods State Park approximately 3.8 miles southwest of Long Ridge OSP.	Not Expected
Arabis blepharophylla coast rockcress	Fed: None CA: None CEQA: 4.3	Occurs on rocky substrates in broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. Known from CCA, LAK, MNT, MRN, SFO, SMT, and SON counties between 3-1,100 meters. Uncertain about distribution in SCR County.	February-May perennial herb	Suitable vegetation associations are present within the Program Area. The nearest herbarium record is a V. Mayer collection (Accession #9992) from above Guadalupe Reservoir on the eastern edge of Sierra Azul OSP. However, this collection seems suspect as it is too far south and inland for the known range of this species.	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				This species possibly occurs in Treatment areas that support rocky grassland habitat in the vicinity of Teague Hill OSP. This species does not do well in understory conditions.	
Arctostaphylos andersonii Anderson's manzanita	Fed: None CA: None CEQA: 1B.2	Occurs in broadleafed upland forest, chaparral, and North Coast coniferous forest in openings and edges. Known from SCL, SCR, and SMT counties between 60-760 meters. Confused with other species merged with it as varieties.	November-May shrub (evergreen)	Suitable vegetation associations and structure present within the Program Area. Two CNDDB occurrences are recorded within the Program Area at La Honda Creek OSP and Sierra Azul OSP. CNDDB occurrence EONDX #64138 is a non-specific location on Highway 35 southwest of Wunderlich County Park from historical collections. CNDDB occurrence EONDX #96082 is a specific location on the southwest side of Soquel Creek, just south of the Sierra Azul OSP boundary. The occurrence in La Honda Creek OSP is in a Potential Treatment area and possibly occurs in other Treatment areas in forest and woodland habitat with intermittent canopies throughout the Program Area. As a manzanita this species is fire adapted and an obligate seeder. It could benefit from creating openings in canopy structure and members of the same species complex have been known to germinate from fuels reduction projects.	Present and Possible
Arctostaphylos glutinosa Schreiber's manzanita	Fed: None CA: None CEQA: 1B.2	Occurs on diatomaceous shale substrate in closed-cone coniferous forest and chaparral. Known only from SCR county from seven occurrences between 170-685 meters.	March-April perennial shrub (evergreen)	No suitable vegetation associations are present on the necessary substrate. This species is also restricted to the Big Basin area of Santa Cruz County. The nearest recorded CNDDB occurrence (EONDX #20237) is a specific location within a mile of Eagle Rock approximately 8 miles southwest of Long Ridge OSP.	None

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Arctostaphylos ohloneana Ohlone manzanita	Fed: None CA: None CEQA: 1B.1	Occurs on siliceous shale substrate in closed-cone coniferous forest and coastal scrub. Known only from SCR county from four occurrences between 450-530 meters.	February-March perennial shrub (evergreen)	No suitable vegetation associations are present on the necessary substrate. This species is also restricted to the Big Basin area of Santa Cruz County. The nearest recorded CNDDB occurrence (EONDX #75420) is a specific location just north of Big Basin Redwoods State Park and 9.2 miles southwest of Long Ridge OSP.	None
Arctostaphylos regismontana Kings Mountain manzanita	Fed: None CA: None CEQA: 1B.2	Occurs in granitic or sandstone sites in broadleafed upland forest, chaparral, and North Coast coniferous forest. Known from SCL and SMT counties between 305-730 meters. May be found in SCR County.	December-April shrub (evergreen)	Suitable vegetation associations and substrates present within the Program Area. There are 12 CNDDB occurrences recorded within the Program Area at Long Ridge, Purisima Creek, El Corte de Madera Creek, Teague Hill, La Honda Creek, Thornewood, and Edgewood OSPs. CNDDB occurrences EONDX #56344, 56351, 56346, and 56345 are non-specific locations at the head of Peters Creek in Long Ridge OSP, WNW of Sierra Moreno, on Skyline Blvd. north of the junction with Kings Mountain Rd., and in the vicinity of Kings Mountain Road between Woodside and Skyline Blvd, respectively. CNDDB occurrences EONDX #56352 and #56355 are specific locations in El Corte de Madera OSP in the vicinity of Skeggs Point and at the south end of the preserve. CNDDB occurrences EONDX #94283 and #94284 are specific locations at the north end of La Honda Creek OSP. CNDDB occurrences EONDX #56349 and #94288 are specific locations in Teague Hill OSP. CNDDB occurrence EONDX #94293 is a specific location at Edgewood County Park. The occurrences in Teague Hill, El Corte de Madera Creek, Thornewood, and La Honda Creek OSPs are within Potential and Existing Treatment	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				areas. The species possibly occurs in other Treatment areas that support forest and woodland habitat on Butano sandstone primarily from El Corte de Madera Creek OSP and north. As a manzanita this species is fire adapted and an obligate seeder. It could benefit from creating openings in canopy structure.	
Arctostaphylos silvicola Bonny Doon manzanita	Fed: None CA: None CEQA: 1B.2	Occurs on inland marine sands in closed-cone coniferous forest, chaparral, and lower montane coniferous forest. Known only from SCR County between 120-600 meters.	January-March perennial shrub (evergreen)	No suitable vegetation associations are present on the necessary substrate. This species also restricted to the area surrounding Santa Cruz, west of the Santa Cruz Mountain crest. The nearest recorded CNDDB occurrence (EONDX #98610) is a non-specific location around the town of Glenwood approximately 2 miles west of Sierra Azul OSP.	None
Astragalus nuttallii var. nuttallii ocean bluff milk-vetch	Fed: None CA: None CEQAL: 4.2	Occurs in coastal bluff scrub and coastal dunes. Known from MNT, MRN, SBA, SLO, and SMT counties between 3-120 meters. Presumed extirpated from ALA and SFO counties.	January-November perennial herb	No suitable vegetation associations are present on the necessary substrate. The nearest herbarium record is a G. E. Sindel collection (Accession #UC1128883) from NNW of Pescadero approximately 4 miles south of Tunitas Creek OSP.	None
Astragalus pycnostachyus var. pycnostachyus coastal marsh milk-vetch	Fed: None CA: None CEQA: 1B.2	Occurs in mesic coastal dunes, coastal scrub, and coastal salt marshes and swamps in streamside sites. Known from HUM, MRN, SLO, and SMT counties between 0-30 meters.	June-October perennial herb	No suitable vegetation associations are present on the necessary substrate or wetland conditions. This species is also restricted to lower elevations on the west side of the Santa Cruz Mountain crest than present within the Program Area. The nearest recorded CNDDB occurrence (EONDX #49630) is a specific location at the mouth of Tunitas Creek, 0.1 mile west of Tunitas Creek OSP.	None
Astragalus tener var. tener alkali milk-vetch	Fed: None CA: None CEQA: 1B.2	Occurs on alkaline substrates in playas, valley and foothill grassland on adobe clay, and vernal pools	March-June annual herb	Although suitable vegetation associations are present the preferred alkaline substrate is absent from the Program Area. The nearest recorded	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		between 1-60 meters. Known from ALA, MER, NAP, SOL and YOL counties. Presumed extirpated from CCA, MNT, SBT, SCL, SFO, SJQ, SON, and STA counties.		CNDDB occurrence (EONDX #8259) is a non-specific location near Mayfield Slough approximately 0.9 mile west of Stevens Creek Shoreline Nature Study Area. This occurrence is based on a historical collection and is possibly extirpated.	
Calandrinia breweri Brewer's calandrinia	Fed: None CA: None CEQA: 4.2	Occurs on sandy or loamy soils at disturbed sites and burns in chaparral and coastal scrub. Known from CCA, LAX, MEN, MNT, MPA, MRN, NAP, ORA, RIV, SBA, SBD, SCL, SCR, SCZ, SDG, SHA, SLO, SMT, SON, SRO, and VEN counties between 10-1,220 meters.	March-June annual herb	Suitable vegetation associations present. This species is a pyrophyte but has also known to germinate from mastication. Two herbarium records were collected from within the Program Area. A Rawlings and Hickman collection (Accession #15876) is from the Mt. Umunhum Summit Trail in Sierra Azul OSP. A Thomas collection (Accession #233941) is from the Stevens Creek Reservoir, near Picchetti Ranch and Fremont Older OSPs. This species possibly occurs in chaparral dominated Treatment areas that have been disturbed anywhere in the Program Area.	Possible
Calochortus umbellatus Oakland star-tulip	Fed: None CA: None CEQA: 4.2	Occurs often on serpentine substrate in broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, and valley and foothill grassland. Known from ALA, CCA, LAK, MRN, SCL, SMT, and STA counties between 100-700 meters. Presumed extirpated from SCR county.	March-May perennial herb (bulbiferous)	Suitable vegetation associations and substrate present within the Program Area. The nearest herbarium record is a Davy collection (Accession #UC423011) from Belmont, approximately 2 miles north of Pulgas Ridge OSP. This species possibly occurs in Treatment areas that primarily support intermittent canopy woodlands near grasslands in the vicinity of Kings Mountain such as Miramontes Ridge, Purisima Creek Redwoods, and Teague Hill OSPs. This species prefers partial shade habitats but may not persist when canopies close.	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Calyptridium parryi var. hesseae Santa Cruz Mountains pussypaws	Fed: None CA: None CEQA: 1B.1	Occurs on sandy or gravelly substrates in openings of chaparral and cismontane woodland. Known from MNT, SCL, SCR, SLO, and STA counties between 305-1,530 meters.	May-August annual herb	Suitable vegetation associations and substrates are present within the Program Area. However, it is suspected that this species is a pyrophyte. One CNDDB occurrence is recorded within the Program Area at Sierra Azul OSP. CNDDB occurrence EONDX #73273 is a non-specific location near Loma Prieta based on historic collections. This taxon possibly occurs in Treatment areas in the vicinity of Sierra Azul OSP. Little is known about this seldom seen species in the Bay Area is suspected to be a narrowly distributed fire follower.	Possible
Carex comosa bristly sedge	Fed: None CA: None CEQA: 2B.1	Occurs in coastal prairie, marshes and swamps on lake margins, and valley and foothill grassland. Known from CCA, LAK, MEN, SAC, SCR, SHA, SJQ, and SON counties between 0-625 meters. Presumed extirpated from SBD and SFO counties.	May-September perennial herb (rhizomatous)	Although suitable vegetation associations are present within the Program Area this taxon occurs west of the Santa Cruz Mountains crest and occurs in habitat where Treatments are not targeted. The nearest recorded CNDDB occurrence (EONDX #28970) is a specific location at Whites Lagoon 2.9 miles south of Sierra Azul OSP.	Not Expected
Centromadia parryi subsp. congdonii Congdon's tarplant	Fed: None CA: None CEQA: 1B.1	Occurs in alkaline sites in valley and foothill grassland. Known from ALA, CCA, MNT, SCL, SLO, and SMT counties between 0-230 meters. Presumed extirpated from SCR and SOL counties.	May-October annual herb	Although suitable vegetation associations are present the preferred alkaline substrate is absent from the Program Area. This species is also restricted to bay shore habitats in this part of its range and occurs in habitat where Treatments are not targeted. One CNDDB occurrence is recorded within the Program Area at Stevens Creek Shoreline Nature Study Area. CNDDB occurrence #42359 is a specific location at Shoreline Mountain View Park.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Chlorogalum pomeridianum var. minus dwarf soaproot	Fed: None CA: None CEQA: 1B.2	Occurs in chaparral on serpentine soils. Known from ALA, COL, GLE, LAK, SCL, SLO, SON, and TEH counties between 305-1,000 meters.	May-August perennial herb (bulbiferous)	Although suitable vegetation associations and substrate are present this taxon occurs on the east side of Santa Clara County east of Coyote Creek. The nearest recorded CNDDB occurrence (EONDX #105965) is a non-specific location near Coyote Creek approximately 6 miles east of Sierra Azul OSP. This occurrence is based on a historic collection.	Not Expected
Chloropyron maritimum subsp. palustre Point Reyes bird's-beak	Fed: None CA: None CEQA: 1B.2	Occurs in coastal salt marshes and swamps. Known from HUM, MRN, SFO, and SON counties and Oregon from 0-10 meters. Presumed extirpated from ALA, SCL, and SMT counties.	June-October annual herb (hemiparasitic)	Although suitable vegetation associations are present within the Program Area, Program Treatments are not anticipated in these habitats. One CNDDB occurrence is recorded within the Program Area at Ravenswood OSP. CNDDB occurrence #17541 is a non-specific location near Palo Alto based on historic collections and is possibly extirpated.	Not Expected
Cirsium fontinale subsp. campylon Mt. Hamilton thistle	Fed: None CA: None CEQA: 1B.2 Other: SCVHP	Occurs on serpentinite seeps in chaparral, cismontane woodland, and valley and foothill grassland. Known from ALA, SCL, and STA counties between 100-890 meters.	April-October perennial herb	Suitable vegetation associations, substrates, and hydrology are present in the Program Area. Four CNDDB occurrences are recorded within the Program Area at Sierra Azul OSP. CNDDB occurrences #94012, #17132, and #80406 are specific locations south of Guadalulpe Reservoir Dam. CNDDB occurrence #60197 is a specific location on the southeast slope of Mount Umunhum in Sierra Azul OSP. The occurrence in Sierra Azul OSP is in a Potential Treatment area and this taxon possibly occurs in other Treatment areas that include serpentine seep habitat with suitable habitat in Sierra Azul OSP. This species occupies habitat that does not typically burn.	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Cirsium praeteriens lost thistle	Fed: None CA: None CEQA: 1A	Known from only two collections from Palo Alto, the most recent in 1901. Presumed extirpated from SCL County. Not in TJM.	June-July perennial herb	Although suitable vegetation and substrate is present this species is endemic to the flatlands around Palo Alto and considered extinct due to urbanization. The nearest recorded CNDDB occurrence (EONDX #27370) is a non-specific location in Palo Alto approximately 1.6 miles west of Ravenswood OSP. This occurrence is based on historic collections and is possibly extirpated.	Not Expected
Clarkia breweri Brewer's clarkia	Fed: None CA: None CEQA: 4.2	Occurs often on serpentine soils in chaparral, cismontane woodland, and coastal scrub. Known from ALA, FRE, MER, MNT, SBT, SCL, and STA counties between 215-1,115 meters.	April-June annual herb	Suitable vegetation associations and substrates present. One herbarium record, a Rawlings and Hickman collection (Accession #15600), is recorded within the Program Area at Sierra Azul OSP. This species possibly occurs in serpentine chaparral Treatment areas of Sierra Azul OSP. It prefers rocky serpentine barren habitat with very little cover that does not carry fire well. Although the genus Clarkia is a well-known pyrophyte.	Possible
Clarkia concinna subsp. automixa Santa Clara red ribbons	Fed: None CA: None CEQA: 4.3	Occurs in chaparral and cismontane woodland. Known from ALA, SCL and SCR counties between 90-1,500 meters.	May-July annual herb	Suitable vegetation associations are present within the Program Area. Seven CNDDB occurrences are recorded within the Program Area at Monte Bello, Fremont Older, Skyline Ridge, Saratoga Gap, Long Ridge, Sierra Azul, and Bear Creek Redwoods OSPs. CNDDB occurrences #996, 29056, 30292, and 28954 are non-specific locations based on historic collections in the vicinity of Gold Mine Creek south of Palo Alto, near Saratoga Summit, in the vicinity of Loma Prieta, and near Lexington, respectively. CNDDB occurrence #832 is a non-specific location west of Saratoga at the junction of Stevens Creek Road and Redwood Gulch Road. CNDDB occurrences #319 and #320 are specific locations	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				along the road to Mt. Umunhum and along the road to El Sombroso in Sierra Azul OSP. All of these occurrences above are non-specific but nearby Potential and Existing Treatment areas. This taxon possiblly occurs in woodland habitat primarily in preserves located in Santa Clara County, from Monte Bello OSP south. The genus Clarkia is a well-known pyrophyte.	
Collinsia corymbosa round-headed Chinese-houses	Fed: None CA: None CEQA: 1B.2	Occurs in coastal dunes. Known from HUM, MEN, SCL, and SON counties from 0-20 meters. May be present in MRN County. Presumed extirpated from SFO County. May intergrade with C. bartsiifolia var. bartsiifolia.	April-June annual herb	No suitable vegetation associations or sand dune habitat present. The nearest recorded CNDDB occurrence (EONDX #104429) is a non-specific location in Palo Alto approximately 1.7 miles from Ravenswood OSP. This occurrence is based on a historic collection and is presumed extirpated by development.	None
Collinsia multicolor San Francisco collinsia	Fed: None CA: None CEQA: 1B.2	Occurs in closed-cone coniferous forest and coastal scrub, sometimes on serpentine. Known from MNT, MRN, SCL, SCR, SFO, and SMT counties between 30-250 meters.	March-May annual herb	Suitable vegetation associations and substrates present within the Program Area. This species also occurs in cismontane locally. Two CNDDB occurrences are recorded within the Program Area. CNDDB occurrence #81186 is a non-specific location in Almaden Quicksilver County Park. CNDDB occurrence #56870 is a specific location at Edgewood County Park. The occurrence at Almaden Quicksilver is in a Potential Treatment area and this species possibly occurs in other Treatment areas within openings of forest and scrub canopies with suitable habitat in Sierra Azul OSP. This species prefers partial shade conditions of given habitats.	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Cypripedium fasciculatum clustered lady's-slipper	Fed: None CA: None CEQA: 4.2	Occurs in lower montane coniferous forest and North Coast coniferous forest usually in serpentine seeps and streambanks. Known from BUT, DNT, GLE, HUM, MEN, NEV, PLU, SCL, SHA, SIE, SIS, SMT, THE, TRI and YUB counties between 100-2,435 meters. Presumed extirpated from SCR county.	March-August perennial herb (rhizomatous)	Suitable vegetation associations, hydrology, and substrates present with in the Program Area. The nearest herbarium record is a Deitrich collection (Accession#UC673588) from Lake Pilarcitos, about 5 miles north of Miramontes OSP. This species possibly occurs in Treatment areas that support coniferous forest and are located on serpentine wetlands.	Possible
Cypripedium montanum mountain lady's-slipper	Fed: None CA: None CEQA: 4.2	Occurs is broadleafed upland forest, cismontane woodland, lower montane coniferous forest and North Coast coniferous forest. Known from DNT, GLE, HUM, MAD, MOD, MPA, PLU, SHA, SIE, SIS, SON, THE, and TUO counties between 185-2,225 meters. Presumed extirpated in SCR and SMT counties.	March-August perennial herb (rhizomatous)	Suitable vegetation associations and hydrology are present with in the Program Area. The nearest herbarium record is a Davis collection (Accession#UC429115) from the Lexington Hills about 1 mile east of Bear Creek Redwoods OSP. This species possibly occurs in Treatment areas that support moist forest and woodland habitats located on the west side of the Santa Cruz Mountain crest north of Saratoga Gap OSP. The habitat this species occurs in does not carry fire well.	Possible
Dirca occidentalis western leatherwood	Fed: None CA: None CEQA: 1B.2	Occurs on mesic sites in broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. Populations declining not reproducing well. Known from ALA, CCA, MRN, SCL, SMT, and SON counties between 25-425 meters.	January-April shrub (deciduous)	Suitable vegetation associations and site conditions present within the Program Area. There are 17 CNDDB occurrences recorded within the Program Area. CNDDB occurrences EONDX #64045, 56206, 94408, 94412, and 94410 are specific locations in La Honda Creek OSP. CNDDB occurrences EONDX #29967, 29966, and 29965 are specific locations in Edgewood County Park. CNDDB occurrences #29985, 29986, and 94390 are non-specific locations near Langley Hill, at St. Joseph's Seminary in Rancho San Antonio County	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				Park, and at Picchetti Ranch OSP, respectively. CNDDB occurrences #81046, 81050, 94397, 94392, 94414, and 94402 are specific locations in Rancho San Antonio County Park, Windy Hill OSP, Coal Creek OSP, Fremont Older OSP, Pulgas Ridge OSP, and Los Trancos OSP, respectively. The occurrences in La Honda Creek, Windy Hill, Coal Creek, Los Trancos, Rancho San Antonio, and Picchetti Ranch OSPs are within Potential and Existing Treatment areas. This species possibly occurs in other Treatment areas, primarily in these preserves and further north. It almost always occupies openings of woodlands, roadsides, or low canopy shrubland were it has access to filtered light or partial shade. These conditions may be a result of disturbance, such as fire, creating an opening in woodland canopies.	
Elymus californicus California bottle-brush grass	Fed: None CA: None CEQA: 4.3	Occurs in broadleafed upland forest, cismontane woodland, North Coast coniferous forest and riparian woodland. Known from MRN, SCR, SMT and SON counties between 15-470 meters.	May-August perennial herb	Suitable vegetation associations are present in the Program Area. The nearest herbarium record is a Kellogg collection (Accession #UC50673) from San Gregorio's Redwoods, less than 0.1 mile north of Tunitas Creek OSP. This species possibly occurs in Treatment areas with woodland and forest habitat from La Honda OSP north. Perennial native grasses typically benefit from fire. This species could be harmed from creating openings in the canopy.	Possible
Eriogonum nudum var. decurrens Ben Lomond buckwheat	Fed: None CA: None CEQA: 1B.1	Occurs on sandy substrates in chaparral, cismontane woodland, and maritime ponderosa pine sandhills. Known from SCR county	June-October perennial herb	No suitable vegetation associations on the necessary sandy substrate are present. This species is also restricted to the locations west of the Santa Cruz Mountains crest. The nearest recorded CNDDB occurrence (EONDX #109953) is a	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		counties between 50-800 meters. Possibly occurs in SCL county.		non-specific location south of Glenwood approximately 4 miles west of Sierra Azul OSP. This occurrence is based on a historic collection.	
Eryngium aristulatum var. *hooveri* Hoover's button-celery	Fed: None CA: None CEQA: 1B.1	Occurs in vernal pools. Known from ALA, SBT, SDG, and SLO counties between 3-45 meters. Presumed extirpated from SCL County. Almost all collections old.	July annual/perennial herb	No suitable vegetation associations or vernal hydrology present. This species is also restricted to bay shore habitats in this part of its range and occurs in habitat where Treatments are not targeted. The nearest recorded CNDDB occurrence (EONDX #56045) is a non-specific location near Stanford University, approximately 3 miles east of Windy Hill OSP. This occurrence is based on historic collections and is possibly extirpated.	None
Eryngium jepsonii Jepson's coyote thistle	Fed: None CA: None CEQA: 1B.2	Occurs in clay sites in valley and foothill grassland and vernal pools. Known from ALA, AMA, CAL, CCA, FRE, NAP, SMT, SOL, STA, TUO, and YOL counties between 3-300 meters. Previously misapplied in part to E. aristulatum var. aristulatum.	April-August perennial herb	Suitable vegetation associations and substrate present. The nearest recorded CNDDB occurrence (EONDX #103656) is a non-specific location approximately 1.5 miles east of the Program Area, at Jasper Ridge Biological Preserve. This species possible occurs in Treatment areas that support grassland habitat in lower elevation OSPs nearby Jasper Ridge. This perennial species is not likely to be negatively impacted by fire.	Possible
Erysimum franciscanum San Francisco wallflower	Fed: None CA: None CEQA: 4.2	Often occurs on serpentine or granitic soils in chaparral, coastal dunes, coastal scrub, and valley and foothill grassland. Rare and declining in SCR County. Includes E. f. var. crassifolium. Known from MRN, SCL, SCR, SFO, SMT, and SON counties between 0-550 meters.	March-June perennial herb	Although suitable vegetation associations are present in the Program Area, its preferred serpentine or granitic substrates are absent from the northern portion of the study are where it would be possible. The nearest herbarium record is a Yadon collection (Accession #H-0186) from Pigeon Point Lighthouse about 11.5 miles southwest of Russian Ridge OSP.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Fissidens pauperculus minute pocket moss	Fed: None CA: None CEQA: 1B.2	Occurs in North Coast coniferous forest. Known from ALA, BUT, DNT, HUM, MEN, MRN, SCR, SMT, SON and YUB counties between 10-1,024 meters.	Moss	Suitable vegetation associations are present within the Program Area. The nearest CNDDB occurrence is recorded immediately adjacent to the Program Area, abutting Long Ridge and Skyline Ridge OSPs. CNDDB occurrence #94043 is a non-specific location at Portola State Park based on a historic collection. This taxon possible occurs in Treatment areas with suitable habitat preferably road cuts and bare mineral soil at Long Ridge, Skyline Ridge, and Tunitas Creek OSPs. The type of preferred habitat this species occupies is not expected to carry fire well. Openings in the forest canopy may harm this species.	Possible
Fritillaria liliacea Fragrant fritillary	Fed: None CA: None CEQA: 1B.2 Other: SCVHP	Occurs in cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland near the coast, on clay or serpentinite. Known from ALA, CCA, MNT, MRN, SBT, SCL, SFO, SMT, SOL and SON counties between 3-410 meters.	February-April perennial herb (bulbiferous)	Suitable vegetation associations and substrate are present within the Program Area. Three CNDDB occurrences are recorded within the Program Area. CNDDB occurrence EONDX #94640 is a specific area northwest of Guadalupe Reservoir at Sierra Azul OSP. CNDDB occurrences EONDX #17657 and 22375 are specific locations in Edgewood County Park. This species possibly occurs in Treatment areas that support serpentine grassland habitat between Sierra Azul OSP and Rancho San Antonio OSP. This bulbiferous species is not likely to be negatively impacted by fire. Fire can be a benefit to some bulbiferous taxa.	Possible
Galium andrewsii subsp. gatense	Fed: None CA: None CEQA: 4.2	Occurs on serpentine, rocky substrates in chaparral, cismontane woodland, and lower montane	April-July perennial herb	Suitable vegetation associations and substrates are present in the Program Area. There is one herbarium record within the Program Area. A	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
phlox-leaf serpentine bedstraw		coniferous forest. Known from ALA, CCA, COL, FRE, LAX, MNT, SBT, SCL, and SLO counties between 150-1,450 meters.		Rawlings and Hickman collection (Accession #CAS-BOT-BC-626460) is recorded on Mt. Umunhum in Sierra Azul OSP. This species possibly occurs in Treatment areas with rocky substrates at higher elevations of Sierra Azul OSP. The preferred habitat of this species does not carry fire well.	
Grimmia torenii Toren's grimmia	Fed: None CA: None CEQA: 1B.3	Occurs in openings, on boulder and rock walls, and on rocky, carbonate, and volcanic substrates in chaparral, cismontane woodland, and lower montane coniferous forest. Known from CCA, COL, LAK, MEN, MNT, SCR, and SMT counties between 325-1,160 meters.	moss	Although suitable vegetation associations and substates are present within the Program Area this species is locally restricted to the area around Big Basin. The nearest recorded CNDDB occurrence (EONDX #93670) is a specific location 3.7 miles west of Long Ridge OSP, in Big Basin Redwoods State Park.	Not Expected
Grimmia vaginulata vaginulate grimmia	Fed: None CA: None CEQA: 1B.1	Occurs on rocky, carbonate substrate and on boulder and rock walls in openings of chaparral. Known from SBD and SCR counties.	moss	Although suitable vegetation associations and substates are present within the Program Area this species is locally restricted to the area around Big Basin. The nearest recorded CNDDB occurrence (EONDX #93658) is a specific location in Big Basin Redwoods State Park 3.7 miles west of Long Ridge OSP. This is the type locality for this species.	Not Expected
Grindelia hirsutula var. maritima San Francisco gumplant	Fed: None CA: None CEQA: 3.2	Occurs on serpentine or sandy substrates in coastal bluff scrub, coastal scrub, and valley and foothill grassland. Can be difficult to identify. Known from MRN, SFO, SLO, and SMT counties between 15-400 meters. Possibly occurs in MNT and SCR counties.	August-September perennial herb	Although suitable vegetation associations and substrates are present in the Program Area, this taxon prefers more immediate coastal habitats. The nearest recorded CNDDB occurrence (EONDX 16946) is about 7 miles northwest of Miramontes Ridge OSP in McNee Ranch State Park.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Hesperevax sparsiflora var. brevifolia short-leaved evax	Fed: None CA: None CEQA: 1B.2	Occurs in sandy coastal bluff scrub, coastal dunes, and coastal prairie. Known from DNT, HUM, MEN, MRN, SCR, SMT, and SON counties between 0-215 meters. Also known from Oregon. Presumed extirpated from SFO County. May intergrade with var. sparsiflora in the San Francisco Bay area.	March-June annual herb	No suitable vegetation associations are present within the Program Area. The nearest recorded CNDDB occurrence (EONDX #72673) is a non-specific location on Black Mountain, near Skyline Blvd, 2.9 miles north of Miramontes Ridge OSP. This occurrence is based on a historic collection.	None
Hoita strobilina Loma Prieta hoita	Fed: None CA: None CEQA: 1B.1 Other: SCVHP	Occurs usually on serpentinitic and mesic sites in chaparral, cismontane woodland, and riparian woodland. Known from CCA, SCL, and SCR counties between 30-860 meters. Presumed extirpated from ALA County	May-October perennial herb	Suitable vegetation associations, substrates and site conditions are present in the Program Area. Ten CNDDB occurrences are recorded within the Program Area. CNDDB occurrences #63301 and #50137 are specific locations NNW and northeast of Lexington Dam in El Sereno and Saint Joseph's Hill OSPs. CNDDB occurrence #63302 is a non-specific location east of Lexington Dam in Sierra Azul OSP. CNDDB occurrences #63303, 80507, 80510, 50134, 60439, 60447, and 63296 are all specific locations in Sierra Azul OSP east of Lexington Dam, southwest of Guadalupe Reservoir Dam, south of Guadalupe Reservoir Dam, on Loma Prieta Ave, west of Jacques Ridge, on the southeast slope of Mt. Umunhum, and south of the mouth of Rincon Creek, respectively. The occurrences in St. Joseph's Hill OSP and Sierra Azul OSP are within Potential and Existing Treatment areas. This species possibly occurs in other Treatment areas primarily on serpentine in chaparral and woodland ecotones in Santa Clara County preserves south of El Sereno OSP. As as perennial herb this species fire response is likely	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				neutral. However, Changes in vegetation structure, could be detrimental.	
Horkelia cuneata var. sericea Kellogg's horkelia	Fed: None CA: None CEQA: 1B.1	Occurs in sandy or gravelly openings in closed-cone coniferous forest, maritime chaparral, coastal dunes, and coastal scrub. Known from MNT, SBA, SCR, SLO, and SMT counties between 10-200 meters. Presumed extirpated from ALA, MRN, and SFO counties. Occurrence from the Crocker Hills probably the last remaining location in S.F. Bay.	April-September perennial herb	Suitable vegetation associations and substrates present within the Program Area. The nearest recorded CNDDB occurrence (EONDX #64647) is a specific location just east of Half Moon Bay approximately 1 mile north of Miramontes Ridge OSP. This taxon possibly occurs in Treatment areas on the margins of coastal scrub and maritime chaparral between La Honda Creek OSP and Miramontes Ridge OSP. Due to its preference for edge habitat on scrub and chaparral this species is considered fire adapted. Changes in vegetation structure, such as scrub encroachment or removal, could be detrimental.	Possible
Iris longipetala coast iris	Fed: None CA: None CEQA: 4.2	Occurs in coastal prairie, lower montane coniferous forest, and mesic meadows and seeps. Known from ALA, CCA, HUM, MEN, MNT, MRN, NAP, SBT, SCL, SFO, SMT, SOL, and SON between 0-600 meters.	March-May perennial herb (rhizomatous)	Suitable vegetation associations and hydrology present within the Program Area. The nearest herbarium record is a Haller collection (Accession #UCSB003161) from the road to Skyline Drive about 0.1 mile north of Thornewood OSP. This species possibly occurs in Treatment areas with suitable habitat that are mesic or include seeps in the north of Windy Hill OSP and La Honda OSP. The mesic habitat this species prefers does not carry fire well.	Possible
Lasthenia californica subsp. *macrantha* perennial goldfields	Fed: None CA: None CEQA: 1B.2	Occurs in coastal bluff scrub, coastal dunes, and coastal scrub. Known from DNT, HUM, MEN, MRN, SCR, SLO, SMT, and SON counties between 5-520 meters.	January-November perennial herb	No suitable vegetation associations are present within the Program Area in the immediate vicinity of the coastal habitats. The nearest CNDDB occurrence (EONDX #103074) is a specific location	None

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				at Montara State Beach, 1.7 miles west of Miramontes Ridge OSP.	
Legenere limosa legenere	Fed: None CA: None CEQA: 1B.1	Occurs in vernal pools. Known from ALA, LAK, MNT, NAP, PLA, SAC, SCL, SHA, SJQ, SMT, SOL, SON, STA, TEH, and YUB counties between 1-880 meters.	April-June annual herb	No suitable vegetation associations or vernal hydrology are present within the Program Area and occurs in habitat where Treatments are not targeted. The nearest recorded CNDDB occurrence (EONDX #17383) is a non-specific location on Coal Mine Ridge approximately 0.1 mile north of Coal Creek OSP.	None
Leptosiphon acicularis bristly leptosiphon	Fed: None CA: None CEQA: 4.2	Occurs in chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland. Known from ALA, BUT, FRE, HUM, LAK, MEN, MRN, NAP, SCL, SMT, and SON counties between 55-1,500 meters. Uncertain about distribution in CCA County.	April-July annual herb	Suitable vegetation associations are present within the Program Area. The nearest herbarium record is a Barry collection (Accession # CAS-BOT-BC226538) from Coal Mine Ridge near Coal Creek OSP. This species possibly occurs in Treatment areas in habitat with very little vegetative cover in the vicinity of Coal Mine Ridge. Changes in vegetation structure, such as scrub encroachment or removal, could be detrimental.	Possible
Leptosiphon ambiguus serpentine leptosiphon	Fed: None CA: None CEQA: 4.2	Occurs on serpentine in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland. Known from ALA, CCA, MER, SBT, SCL, SCR, SJQ, SMT and STA counties between 55-1,500 meters.	April-July annual herb	Suitable vegetation associations and substrate are present within the Program Area. There are three herbarium records from within the Program Area. A Thomas collection (Accession #226998) and two Rawlings and Hickman collections (Accession #s 15535 and 15572) are all from the vicinity of Mt. Umunhum in Sierra Azul OSP. This species possibly occurs in Treatment areas with serpentine substrates between El Sereno OSP and Sierra Azul OSP. The fire response of this species is considered neutral.	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Leptosiphon grandiflorus large-flowered leptosiphon	Fed: None CA: None CEQA: 4.2	Occurs on usually sandy substrate in coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, and valley and foothill grassland. Known from ALA, KRN, MAD, MER, MNT, MRN, SCL, SCR, SFO, SLO, SMT, and SON counties between 5-1,220 meters. Presumed extirpated from SBA County.	April-August annual herb	Although suitable vegetation associations are present the preferred sandy substrate is absent. The nearest herbarium record is a Santana collection (Accession #8716) from Uvas Canyon approximately 5.7 miles east of Sierra Azul OSP.	Not Expected
Leptosiphon rosaceus rose leptosiphon	Fed: None CA: None CEQA: 1B.1	Occurs in coastal bluff scrub. Known from MRN and SMT counties between 0-100 meters. Presumed extirpated from SFO and SON counties. Not in TJM.	April-July annual herb	No suitable vegetation associations are present within the Program Area. This species is also restricted to a narrow band of habitat along the San Mateo County coastline. The nearest recorded CNDDB occurrence (EONDX #95234) is a specific location at Pillar Point Bluff, 4.9 miles northwest of Miramontes Ridge OSP.	None
Lessingia arachnoidea Crystal Springs lessingia	Fed: None CA: None CEQA: 1B.2	Occurs on serpentine substrates, often on roadsides in cismontane woodland, coastal scrub, and valley and foothill grassland. Known only from Crystal Springs Reservoir in SMT County between 60-200 meters. Occurrences from SON County need taxonomic verification.	July-October annual herb	Although suitable vegetation associations and substrates are present within the Program Area this species is restricted to the area around Crystal Springs Reservoir. There are two CNDDB occurrences recorded within 0.5 mile of the Program Area. CNDDB occurrence EONDX #95416 and #1262 are specific locations just west of Edgewood County Park.	Not Expected
Lessingia hololeuca woolly-headed lessingia	Fed: None CA: None CEQA: 3	Occurs on clay and serpentine in broadleafed upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland. Known from ALA, MNT,	June-October annual herb	Suitable vegetation associations and substrates are present within the Program Area. The nearest herbarium record is a Hillaire collection (Accession #CHSC098696) from the northwest	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		MRN, NAP, SCL, SMT, SOL, SON and YOL counties between 15-305 meters. Possibly more widespread in the northern San Francisco Bay, southern Sacramento Valley and southern North Coast Ranges.		corner of Edgewood County Park approximately 0.4 mile east of Pulgas Ridge OSP. This species possibly occurs in Treatment areas that support grassland in heavy clay soils (serpentine or non-serpentine) on the east side of the Santa Cruz Mountain crest at lower elevations from Sierra Azul OSP to Pulgas Ridge OSP. The fire response of this species is considered neutral.	
Lessingia micradenia var. *glabrata* smooth lessingia	Fed: None CA: None CEQA: 1B.2 Other: SCVHP	Occurs on serpentine soils, often on roadsides in chaparral, cismontane woodland, and valley and foothill grassland. Known only from SCL County between 120-420 meters.	July-November annual herb	Suitable vegetation associations and substrates present with in the Program Area. There are three CNDDB occurrences recorded within the Program Area. CNDDB occurrences EONDX #64174, 94096, and 94106 are specific locations southwest of Guadalupe Reservoir in Sierra Azul OSP. The occurrence in Sierra Azul OSP is within Potential Treatment areas. This species possibly occurs in other Treatment areas with serpentine grassland in in Santa Clara County preserves south of El Sereno OSP. The fire response of this species is considered neutral.	Present and Possible
Lupinus arboreus var. *eximius* San Mateo tree lupine	Fed: None CA: None CEQA: 3.2	Occurs in chaparral and coastal scrub. Identification is very difficult. SON County occurrences need taxonomic confirmation. Known from SMT and possibly SON counties between 90-550 meters.	April-July shrub (evergreen)	Suitable vegetation associations are present within the Program Area. The nearest herbarium record is a Kennedy collection (Accession #UC1601763) from north of Pilarcitos Lake approximately 6 miles north of Miramontes Ridge OSP. This taxon possibly occurs in Treatment areas that support scrub habitat surrounding Half Moon Bay. Lupinus species are well adapted to fire, especially those that occur in scrub and chaparral habitats. Changes in vegetation structure, such as scrub encroachment or removal, could be detrimental.	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Malacothamnus arcuatus arcuate bush-mallow	Fed: None CA: None CEQA: 1B.2	Occurs in chaparral and cismontane woodland. Known from SCL, SCR, and SMT counties between 15-355 meters. Recognized as M. fasciculatus in TJM.	April-September shrub (evergreen)	Suitable vegetation associations present within the Program Area. This species is suspected to be a pyrophyte. Seven CNDDB occurrences are recorded within the Program Area. CNDDB occurrences EONDX #55918, 55929, 97753, 55910, and 97754 are non-specific locations in the vicinity of La Honda OSP, near Black Mountain on the Rancho San Antonio OSP, near Los Gatos overlapping with El Sereno OSP and St. Joseph's Hill OSP, around Loma Prieta Peak on Sierra Azul OSP, and on the west end of Pulgas Ridge OSP, respectively. CNDDB occurrences EONDX #94349 and 55923 are specific locations on Russian Ridge in Skyline Ridge OSP and on the north side of Edgewood County Park, respectively. All of these occurrences above are non-specific but nearby Potential and Existing Treatment areas. This taxon possible occurs in chaparral and woodland habitat primarily from Pulgas Ridge OSP south. Malacothamnus species are well adapted to fire. This species could benefit from creating openings in canopy structure.	Possible
Malacothamnus hallii Hall's bush mallow	Fed: None CA: None CEQA: 1B.2	Occurs in chaparral and coastal scrub. Known from CCA, MER, SCL, SMT, and STA counties between 10-760 meters. Recognized as M. fascilulatus in TJM.	May-September shrub (evergreen)	Although suitable vegetation associations are present within the Program Area the distribution of this taxon is east of the Program Area in Santa Clara Valley and Coyote Ridge. The nearest recorded CNDDB occurrence (EONDX #44486) is a specific location at Calero Lake Estates, SSW of Coyote Peak and 3.8 miles east of Sierra Azul OSP.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Micropus amphibolus Mt. Diablo cottonweed	Fed: None CA: None CEQA: 3.2	Occurs on rocky substrates in broadleafed upland forest, chaparral, cismontane woodland, and valley and foothill grassland. Known from ALA, CCA, COL, LAK, MNT, MRN, NAP, SBA, SCL, SCR, SJQ, SOL, and SON counties between 45-825 meters. Can be confused with M. californicus.	March-May annual herb	Suitable vegetation associations and substrates are present in the Program Area. The nearest herbarium record is a Ferris collection (Accession#UC429813) from Page Mill Road about 0.9 mile north of Foothills OSP. This species possible occurs in Treatment areas with suitable habitat at Sierra Azul OSP and Foothills OSP. The fire response of this species is considered neutral.	Possible
Microseris paludosa marsh microseris	Fed: None CA: None CEQA: 1B.2	Occurs in closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Known from MEN, MNT, MRN, SBT, SCR, SLO, SOL, and SON counties between 5-355 meters. Presumed extirpated from SFO and SMT counties.	April-June perennial herb	Although suitable vegetation associations are present within the Program Area this species is restricted to more coastal environments of San Mateo and Santa Cruz counties. The nearest recorded CNDDB occurrence (EONDX #53622) is a non-specific location at Pescadero State Beach, approximately 5.8 miles southwest of La Honda Creek OSP. This occurrence has been extirpated.	Not Expected
Monardella sinuata subsp. *nigrescens* northern curly-leaved monardella	Fed: None CA: None CEQA: 1B.2	Occurs in sandy sites in chaparral in SCR County, coastal dunes, coastal scrub, and lower montane coniferous forest in ponderosa pine sandhills in SCR County. Known from MNT, MRN, and SCR counties between 0-300 meters. Presumed extirpated from SFO County. Previously included in M. undulata.	May-July annual herb	No suitable vegetations associations with preferred substrate are present within the Program Area. This species is also restricted to the Scotts Valley area. The nearest recorded CNDDB occurrence (EONDX #92561) is a non-specific location around Scotts Valley, approximately 6.3 miles west of Sierra Azul OSP. This occurrence is based on a historic collection.	None
Monolopia gracilens woodland woollythreads	Fed: None CA: None CEQA: 1B.2	Occurs on serpentine sites in openings of broadleafed upland forest, openings of chaparral, cismontane woodland, openings of North Coast coniferous forest, and	March-July annual herb	Suitable vegetation associations and substrate present within the Program Area. This species can respond well to fire but is not an obligate pyrophyte. Several CNDDB occurrences are recorded within the Program Area. CNDDB	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		valley and foothill grassland. Known from ALA, CCA, MNT, SBT, SCL, SCR, SLO, and SMT counties between 100-1,200 meters.		occurrence EONDX #80183 is a specific location on the south end of Edgewood County Park, #80162 is a specific location from Foothills OSP, #80155 is a specific location from St Joseph's Hill OSP, and #94193 is from Sierra Azul OSP. Other non-specific occurrences are present at Purisima Creek, Monte Bello, and El Sereno OSPs. The occurrences in Foothills, St. Joseph's Hill, and Sierra Azul OSPs are in Potential and Existing Treatment areas. The remaining occurrences are non-specific but nearby Potential and Existing Treatment areas. This taxon possibly occurs in suitable habitat primarily in OSPs where serpentine is present from Pulgas Ridge OSP south. It should be noted that this species has been observed off serpentine in Contra Costa County in burned scrub and chaparral.	
Orthotrichum kellmanii Kellman's bristle moss	Fed: None CA: None CEQA: 1B.2	Occurs on sandstone and carbonate substrates in chaparral and cismontane woodland. Known from MNT, SCR, and SMT counties between 343-685 meters.	January-February moss	Although suitable vegetation associations and substates are present within the Program Area this species is locally restricted to the area around Big Basin. The nearest recorded CNDDB occurrence (EONDX #70922) is a specific occurrence in Big Basin Redwoods State Park, 3.7 miles southwest of Long Ridge OSP.	Not Expected
Penstemon rattanii var. kleei Santa Cruz Mountains beardtongue	Fed: None CA: None CEQA: 1B.2	Occurs in chaparral, lower montane coniferous forest, and North Coast coniferous forest. Known from SCL and SCR counties from only six occurrences between 400-1,100 meters.	May-June perennial herb	Although suitable vegetation associations are present within the Program Area, Santa Clara County occurrences are suspect as this species has not been specifically observed there based on herbarium label information. It is not expected to be present east of the Santa Cruz Mountain Crest. Two CNDDB occurrences are recorded within the Program Area at Sierra Azul OSP. CNDDB	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				occurrence EONDX #30801 and #30293 are non-specific occurrences on a ridge at the headwaters of Aptos Creek and in the vicinity of Loma Prieta, both based on historic collections.	
Piperia candida white-flowered rein orchid	Fed: None CA: None CEQA: 1B.2	Occurs in broadleafed upland forest, lower montane coniferous forest, and North Coast coniferous forest. Known from DNT, HUM, MEN, SCL, SCR, SIS, SMT, SON, and TRI counties between 30-1,310 meters.	May-September perennial herb	Suitable vegetation associations present within the Program Area. There is one CNDDB occurrence recorded within the Program Area. CNDDB occurrence EONDX #71132 is a non-specific area in Los Trancos OSP. This species possibly occurs in Treatment areas with suitable habitat in Los Troncos, Long Ridge, Skyline, Russian Ridge, and La Honda OSPs. This species may be enhanced by fire or by creating openings in the overstory.	Possible
Plagiobothrys chorisianus var. *chorisianus* Choris' popcornflower	Fed: None CA: None CEQA: 1B.2	Occurs on mesic sites in chaparral, coastal prairie, and coastal scrub. Known from MNT, SCL, SCR, SFO, and SMT counties between 3-160 meters. Presumed extirpated from ALA County. Intergrades with var. hickmanii and differences may be environmentally induced.	March-June annual herb	Suitable vegetation associations and site conditions are present in the Program Area. Seven CNDDB occurrences are recorded within the Program Area. CNDDB occurrence EONDX #94273 is a non-specific location near El Corte Madera Creek that overlaps with Windy Hill OSP based on a historic collection. CNDDB occurrence EONDX #94274 is a specific location on the southeast end of Russian Ridge OSP. CNDDB occurrences EONDX #94276, 94278, and 94277 are specific locations in La Honda Creek OSP, west of Harrington Creek, and east of Bogess Creek. CNDDB occurrences EONDX #94290 and 94281 are specific locations on Miramontes Ridge OSP. The occurrences in La Honda Creek, Windy Hill, Coal Creek, and Russian Ridge OSPs are in Potential and Existing Treatment areas. The remaining occurrences are non-specific but	Present and Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				nearby Potential and Existing Treatment areas. This taxon possibly occurs in mesic grassland habitat north of Skyline Ridge OSP. The fire response of this species is considered neutral.	
Plagiobothrys chorisianus var. *hickmanii* Hickman's popcornflower	Fed: None CA: None CEQA: 4.2	Occurs in closed-cone coniferous forest, chaparral, coastal scrub, marshes and swamps, and vernal pools. Known from MNT, SBT, SCL, SCR, and SLO counties between 15-185 meters. Distribution uncertain in SMT County.	April-June annual herb	Suitable vegetation associations and mesic habitat present within the Program Area. The nearest herbarium record is a Thomas collection (Accession #001411) from Jasper Ridge Biological Preserve about 0.8 mile east of Thornewood OSP. This taxon possible occurs in Treatment areas with mesic grassland habitat in Teague Hill OSP and Thornewood OSP. The fire response of this species is considered neutral.	Possible
Plagiobothrys glaber hairless popcornflower	Fed: None CA: None CEQA: 1A	Occurs in alkaline meadows and seeps and coastal salt marshes and swamps between 15-180 meters. Presumed extirpated from ALA, MRN, SBT, and SCL counties.	March-May annual herb	Although suitable vegetation associations are present within the Program Area the necessary alkaline influence is absent. One CNDDB occurrence is recorded within the Program Area. CNDDB occurrence EONDX #22583 is a non-specific location in the vicinity of Los Gatos that overlaps with El Sereno OSP and St. Joseph's Hill OSP.	Not Expected
Ranunculus lobbii *Lobb's aquatic buttercup*	Fed: None CA: None CEQA: 4.2	Occurs in mesic cismontane woodland, North Coast coniferous forest, valley and foothill grassland, and vernal pools. Known from ALA, CCA, MEN, MRN, NAP, SOL, and SON between 15-470 meters. Presumed extirpated from SCR and SMT counties.	February-May annual aquatic herb	No suitable vegetation associations or vernal hydrology present. This species is also restricted ponds and other still water habitats where Treatments are not targeted. There is one herbarium record from within the Program Area. An Elmer collection (Accession #UC202813) is from the Alpine Schoolhouse in Skyline Ridge OSP.	None

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Senecio aphanactis rayless ragwort	Fed: None CA: None CEQA: 2B.2	Occurs on coastal scrub, chaparral, and cismontane woodland on alkaline soils between 15-800 meters. Known from ALA, CCA, FRE, LAX, MER, MNT, ORA, RIV, SBA, SCL, SCT, SCZ, SDG, SLO, SOL, SRO, and VEN counties.	January-April annual herb	Although suitable vegetation associations are present the Program Area lacks preferred alkaline soils. Two CNDDB occurrences are recorded within the Program Area. CNDDB occurrence EONDX #107760 is a non-specific location along Los Trancos Trail that overlaps with Los Trancos and Foothills OSPs and is based on a historical collection. CNDDB occurrence EONDX #107762 is a non-specific location north of Melendy Dr. that overlaps with Pulgas Ridge OSP and is also based on a historical collection.	Not Expected
Sidalcea malachroides maple-leaved checkerbloom	Fed: None CA: None CEQA: 4.2	Occurs often in disturbed areas in broadleafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, and riparian woodland. Known from DNT, HUM, MEN, MNT, SCL, SCR, and SON counties between 0-730 meters. Specimen from SCL County needs confirmation.	April-August perennial herb	Although suitable vegetation associations and substrates are present in the Program Area, this taxon also prefers more immediate coastal habitats. The nearest recorded CNDDB occurrence (EONDX #2207) is a non-specific location around Santa Cruz, approximately 11 miles southwest of Sierra Azul OSP. This occurrence is based on a historic collection and may be extirpated.	Not Expected
Silene verecunda subsp. verecunda San Francisco campion	Fed: None CA: None CEQA: 1B.2	Occurs on sandy sites in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland. Known from SCR, SFO, and SMT counties between 30-645 meters. Not in TJM2.	March-June perennial herb	Although suitable vegetation associations are present the preferred sandy substrate is absent, also this taxon prefers more immediate coastal habitats. There is one CNDDB occurrence is recorded within the Program Area. CNDDB occurrence EONDX #21263 is a specific location at Edgewood County Park that may be extirpated.	Not Expected
Stebbinsoseris decipiens Santa Cruz microseris	Fed: None CA: None CEQA: 1B.2	Occurs in open areas, sometimes on serpentinite, in broadleafed upland forest, closed-cone coniferous forest, chaparral,	April-May annual herb	Although suitable vegetation associations and substrates are present this species is narrowly distributed around the Swanton Pacific area of Santa Cruz County. The nearest recorded CNDDB	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
		coastal prairie, coastal scrub, and valley and foothill grassland. Known from MNT, MRN, SCR, SFO, and SMT counties between 10-500 meters.		occurrence (EONDX #16903) is a non-specific location between Scott Creek drainage and Mill Creek drainage, approximately 9 miles southwest of Long Ridge OSP. This is the type locality for this species and is based on historic collections.	
Streptanthus albidus subsp. *peramoenus* most beautiful jewelflower	Fed: None CA: None CEQA: 1B.2 Other: SCVHP	Occurs on serpentine sites in chaparral, cismontane woodland, and valley and foothill grassland. Known from ALA, CCA, MNT, SCL, and SLO counties between 95-1,000 meters. No longer recognized in TJM as it has been synonomized with S. glandulosa subsp. glandulosa.	April-September annual herb	Suitable vegetation associations and substrate are present in the Program Area. Four CNDDB occurrences are recorded within the Program Area. CNDDB occurrence EONDX #60341 is a non-specific location on the south side of St. Joseph's Hill OSP. CNDDB occurrence EONDX #80809, #94337, and #94339 are specific locations in Sierra Azul OSP, west of Guadalupe Reservoir, east of the junction of Guadalupe Creek and Hicks Rd., and at the summit of Mt. Umunhum respectively. The occurrences in St. Joseph's Hill OSP and Sierra Azul OSP are in Potential and Existing Treatment areas. This taxon possibly occurs in suitable serpentine habitat south of El Sereno OSP. The rocky or serpentine barren microhabitat this species prefers does not carry fire well.	Present and Possible
Stuckenia filiformis subsp. *alpina* slender-leaved pondweed	Fed: None CA: None CEQA: 2B.2	Occurs in assorted shallow freshwater marshes and swamps. Known from ALA, BUT, CCA, ELD, LAS, MER, MNO, MOD, MPA, NEV, PLA, SHA, SIE, SMT, SOL, and SON counties between 300-2,150 meters. Presumed extirpated from SCL County.	May-July perennial herb (rhizomatous, aquatic)	No suitable vegetation associations or hydrology present in the Program Area. This species is also restricted ponds and other still water habitats where Treatments are not targeted. The nearest recorded CNDDB occurrence (EONDX #838) is a non-specific location in Palo Alto, approximately 1.7 miles west of Ravenswood OSP. This occurrence is based on a historic collection.	None

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
Trifolium buckwestiorum Santa Cruz clover	Fed: None CA: None CEQA: 1B.1	Occurs in broadleafed upland forest, cismontane woodland, and coastal prairie. Known from MEN, MNT, SCL, SCR, SMT and SON counties between 105-610 meters.	April-October annual herb	Suitable vegetation associations present. One CNDDB occurrence is recorded within the Program Area. CNDDB occurrence #109282 is a non-specific location on Coal Mine Ridge that overlaps with Windy Hill OSP. This non-specific occurrence is the only known location east of the Santa Cruz Mountains in this area. No other populations have been documented east of the Santa Cruz Mountains crest. It is likely a disjunct. This taxon possibly occurs in Coal Creek OSP or Windy Hill OSP. The fire response of this species is considered neutral.	Possible
Trifolium hydrophilum saline clover	Fed: None CA: None CEQA: 1B.2	Occurs in marshes and swamps, on mesic and alkaline sites in valley and foothill grassland, and in vernal pools. Known from ALA, CCA, LAK, MNT, NAP, SAC, SBT, SCL, SCR, SJQ, SLO, SMT, SOL, SON, and YOL counties between 0-300 meters. Possibly occurs in COL County.	April-June annual herb	Although suitable vegetation associations are present the appropriate alkaline habitat is absent from the Program Area. This prefers level ground around the bay shore in this area. The nearest CNDDB occurrence (EONDX #49393) is a non-specific location in Belmont, approximately 3.3 miles east of Pulgas Ridge OSP. This occurrence is the type locality and is based on a historic collection.	Not Expected
Usnea longissima Methuselah's beard lichen	Fed: None CA: None CEQA: 4.2	Occurs on tree branches, usually on old growth hardwoods and conifers in broadleafed upland forest and North Coast coniferous forest. Known from DNT, HUM, MEN, SCR, SMT, and SON counties between 50-1,460 meters.	Fructose lichen (epiphytic)	Suitable vegetation associations are present within the Program Area. Two CNDDB occurrences are recorded within the Program Area. CNDDB occurrence EONDX #45319 is a non-specific location at the headwaters of Oil Creek that overlaps with Long Ridge OSP, although this occurrence was extirpated in 2001. CNDDB occurrence EONDX #45320 is a non-specific location by Purisima Creek in Purisima Creek OSP that may be extirpated.	Possible

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
				This taxon possibly occurs in Purisima Creek Redwoods OSP or Long Ridge OSP. This species would be harmed by removal of its host or by crown fire.	

Notes:

[f] **Explanation of State and Federal Listing Codes**

Federal listing codes:

- FE: Federally listed as Endangered
- FT: Federally listed as Threatened
- FPE: Federally proposed for listing as Endangered
- FPT: Federally proposed for listing as Threatened
- FPD: Federally proposed for delisting

California listing codes:

- SE: State listed as Endangered
- ST: State listed as Threatened
- SR: State listed as Rare
- SCE: State candidate for listing as Endangered
- SCT: State candidate for listing as Threatened

California Native Plant Society codes:

- 1A: Presumed extinct in California
- 1B: Rare or Endangered in California and elsewhere
- 2A: Rare or Endangered in CA, more common elsewhere
- 2B: Plants presumed extirpated in California, common elsewhere
- 3: Plants for which we need more information - Review list
- 4: Plants of limited distribution - Watch list

California Native Plant Society Threat Codes:

.1: Seriously Endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2: Moderately Endangered in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

.3: Not very Endangered in California (<20% of occurrences threatened low degree and immediacy of threat or no current threats known

Abbreviations:

AMA Amador
BUT Butte
CAL Calaveras
CCA Contra Costa
CNPS CA Native Plant Society
COL Colusa
DNT Del Norte
ELD El Dorado
FRE Fresno
MER Merced
MNT Monterey
MPA Mariposa
MRN Marin
NAP Napa
NEV Nevada
ORA Orange
OSP Open Space Preserve
PLA Placer
PLU Plumas
SDG San Diego
SFO San Francisco
SHA Shasta
SIE Sierra
SIS Siskiyou
SJQ San Joaquin
SMI San Miguel Island
SMT San Mateo
SNI San Nicolas Island
SOL Solano

Species Name Common Name	Listing Status [a]	Habitat Preferences, Distribution Information, and Notes	Flowering Phenology/Life Form	Habitat Suitability and Local Distribution	Occurrence Potential
GLE Glenn HUM Humboldt KRN Kern LAK Lake LAS Lassen LAX Los Angeles LCP Local Coastal Plan MAD Madera MOD Modoc MEN Mendocino		RIV Riverside SAC Sacramento SBA Santa Barbara SBD San Bernardino SBT San Benito SCL Santa Clara SCR Santa Cruz SCT Santa Catalina Island SCVHP Santa Clara Valley Habitat Plan SCZ Santa Cruz Island		SON Sonoma SRO Santa Rosa Island TEH Tehama TJM The Jepson Manual TRI Trinity TUL Tulare VEN Ventura YOL Yolo YUB Yuba	

Table 4 Special-Status Fish and Wildlife Species Known to Occur or Potentially Occurring on Midpen Lands (Federal/State Listed, Proposed, Candidate and/or Fully Protected Species)

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Invertebrates				
Bombus crotchii Crotch bumble bee	Fed: None CA: SCE	There is limited life history information available for this species, but it is known to nest primarily underground like most other bumblebee species. It is known from open grassland and scrub habitats. Previously found throughout southern California and the Central Valley, but is now nearly absent from the Central Valley (CDFW, 2019).	May occur in grassland, scrub, and sparse woodland habitats throughout Midpen lands. The nearest CNDDB occurrence (EONDX #98636) was recorded in San Jose approximately 3.5 miles north of Sierra Azul OSP. This record is based on a historic collection in an area that is now highly urbanized. There is one recent verified observation from 2019 in Santa Teresa County Park (Bumblebee Watch 2020), approximately 3.5 miles east of Sierra Azul OSP.	Possible
Bombus occidentalis Western bumble bee	Fed: None CA: SCE	The western bumblebee occurs along the West Coast, and elevations of known sites range from sea level to over 2,000 m. Most reports of western bumblebee nests	May occur in grassland, scrub, and sparse woodland habitats throughout Midpen lands.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		are from underground cavities such as old squirrel or other animal nests and in open west-southwest slopes bordered by trees, although a few nests have been reported from above-ground locations such as in logs among railroad ties. Availability of nests sites for western bumblebee may depend on rodent abundance. Nest tunnels have been reported to be up to 2.1 m long for this species and the nests may be lined with grass or bird feathers. Bumble bees require plants that bloom and provide adequate nectar and pollen throughout the colony's life cycle, which is from early February to late November. Rangewide, example food plants include Ceanothus, Centaurea, Chrysothamnus, Cirsium, Geranium, Grindellia, Lupinus, Melilotus, Monardella, Rubus, Solidago, and Trifolium. (Hatfield et al. 2015). Occupies a diverse range of habitats, including mixed woodlands, farmlands, urban areas, montane meadows and into the western edge of the prairie grasslands. Like many bumble bees, it typically nests underground in abandoned rodent burrows or within hollows in decaying wood (COSEWIC 2014).	The nearest CNDDB occurrence (EONDX #100351) is a historical collection from Half Moon Bay, which partially overlaps Miramontes Ridge OSP. There are no recent verified observations of this species in the greater San Francisco Bay Area (Bumblebee Watch 2020).	
Cicindela ohlone Ohlone tiger beetle	Fed: FE CA: None	Inhabits coastal terraces with remnant native grasslands, and is associated with Watsonville loam or Bonnydoon soil types. Adults are found along trails and other barren areas among low-growing grassland vegetation. Known only from 16 locations in the vicinity of the City of Santa Cruz (USFWS 2019).	Midpen lands are outside of this species' known range. The nearest CNDDB occurrence (EONDX #60021) was recorded in near Scotts Valley approximately 5.6 mile southwest of Sierra Azul OSP.	Not Expected
Euphilotes enoptes smithi Smith's blue butterfly	Fed: FE CA: None	Primarily known from dune habitats along Monterey Bay, but also found in chaparral and grasslands where its hostplants, coast buckwheat (*Eriogonum latifolium*) and seacliff buckwheat (*E. parvifolium*) are present.	This species' status north of Monterey Bay is highly uncertain, and they may be extirpated from the area. If present, they would likely only occur in the southernmost portions of Sierra Azul OSP.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		The adult flight period is approximately from mid-June to September (USFWS 2006).	The nearest CNDDB occurrence (EONDX #110648) was recorded in 2000 along Loma Prieta Road within Sierra Azul OSP.	
Euphydryas editha bayensis Bay checkerspot butterfly	Fed: FT CA: None Other: SCVHCP	A California endemic butterfly restricted to serpentine and similar habitats. Host plant is the dwarf plantain (*Plantago erecta*) (Steiner 1990). Secondary host plants include Indian paintbrush (*Castilleja affinis ssp. affinis*) and purple owl's clover (*Castilleja exserta ssp. exserta*). Restricted to six localities in San Francisco (San Bruno Mountain State & County Park), San Mateo (Edgewood County Park and El Corte de Madera) and Santa Clara (Kirby, Metcalf, San Felipe & Silver Creek Hills) counties (USFWS 1998).	May occur in serpentine grasslands within Midpen lands, most likely in Pulgas Ridge OSP. The nearest CNDDB occurrence (EONDX #1263) is a well-documented population located in Edgewood County Park, immediately south of Pulgas Ridge OSP.	Possible
Speyeria zerene myrtleae Myrtle's silverspot butterfly	Fed: FE CA: None	A medium-sized butterfly endemic to the San Francisco Bay Area. Current populations restricted to four sites in western Marin and southwestern Sonoma counties. Inhabits coastal terrace prairie, coastal bluff scrub and adjacent non-native annual grasslands. The host plant is the western dog violet (*Viola adunca*).	Midpen lands are outside of this species' currently known range. The nearest CNDDB occurrence (EONDX #91025) is a historical record located in Pescadero, approximately 4.2 miles southwest of La Honda Creek OSP. This population, along with all others south of the Golden Gate, is considered to be extirpated.	Not Expected
Trimerotropis infantilis Zayante band-winged grasshopper	Fed: FE CA: None	Known only from the Zayante sandhills in Santa Cruz County. Found in sandy soils, and is closely associated with silver bush lupine (*Lupinus albifrons*). Eggs overwinter in the soil, and nymphs begin to emerge in May. The adult flight period is generally from July until the first significant rains of the season (USFWS 2009).	Midpen lands are outside of this species' currently known range. The nearest CNDDB occurrence (EONDX #58357) is a historical collection from 1928 that partially overlaps Bear Creek Redwoods OSP and Sierra Azul OSP. This record is now considered extirpated as it was taken in the town of Alma, which was inundated by the construction of Lexington Reservoir in the 1950's.	Not Expected

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		Fish		
Acipenser medirostris Green sturgeon - Southern Distinct Population Segment (DPS)	Fed: FT CA: SSC	Anadromous fish found in marine waters from the Bering Sea to Ensenada, Mexico. The southern DPS includes all spawning populations south of the Eel River (exclusive), principally including the Sacramento River population. Locally, green sturgeon inhabit Suisun, San Pablo, and San Francisco Bays, and coastal bays and estuaries from Monterey Bay north to Puget Sound. Spawning occurs in the Sacramento River.	May occur in tidal sloughs connected to San Francisco Bay within Midpen lands. All of San Francisco Bay and adjoining tidal marshes and sloughs are designated Critical Habitat for this species.	Possible
Eucyclogobius newberryi Tidewater goby	Fed: FE, CH CA: SSC	A California endemic fish that inhabits brackish coastal lagoons, estuaries and marshes. Range extends from the Smith River in Del Norte County to Agua Hedionda Lagoon in San Diego County. Species is typically an annual species. The Greater Bay Area recovery unit extends from north of Bodega Head in Sonoma County to the Salinas River Valley in Monterey County (USFWS 2008).	No tidally influenced lagoons are present within Midpen lands. The nearest CNDDB occurrence (EONDX #28558) is in San Gregorio Creek at San Gregorio State Beach, approximately 1.1 miles south of Tunitas Creek OSP.	Not Expected
Oncorhynchus kisutch pop. 4 Coho salmon – central California coast ESU	Fed: FE CA: SE	An anadromous fish that typically spends 2 years in the ocean before returning to perennial freshwater streams to spawn. ESU includes all naturally spawned populations from Punta Gorda in northern California south to and including the San Lorenzo River in central California, as well as populations in tributaries to San Francisco Bay including Corte Madera and Mill Valley Creeks, excluding the Sacramento-San Joaquin River system, as well four artificial propagation programs: the Don Clausen Fish Hatchery Captive Broodstock Program, Scott Creek/King Fisher Flats Conservation Program, Scott Creek Captive Broodstock Program, and the Noyo River Fish Station egg-take Program coho hatchery programs. Critical habitat includes all river	May occur in coastal streams and streams tributary to San Francisco Bay with no passage barriers throughout Midpen lands. The nearest CNDDB occurrence (EONDX #28241) is a large record that includes the entire San Lorenzo River and all of its tributaries, covering much of northwestern Santa Cruz County. The uppermost reaches of this occurrence are 0.85 mile south of Long Ridge OSP.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		reaches accessible to coho from Punta Gorda south to San Lorenzo River (NOAA Fisheries 1999).		
Oncorhynchus mykiss irideus pop. 8 Steelhead – central California coast DPS	Fed: FT, CH CA: None	This species is an anadromous fish that spend several years in the ocean; returning to freshwater rivers and tributaries to spawn and rear. Listing includes all naturally spawned anadromous steelhead populations below natural and human-made impassable barriers in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers (NOAA Fisheries 2005a). Tributary streams to Suisun Marsh including Suisun Creek, Green Valley Creek, and an unnamed tributary to Cordelia Slough (commonly referred to as Red Top Creek), excluding the Sacramento-San Joaquin River Basin, as well as two artificial propagation programs: the Don Clausen Fish Hatchery, and Kingfisher Flat Hatchery/ Scott Creek (Monterey Bay Salmon and Trout Project) steelhead hatchery programs (NOAA Fisheries 2005a).	Several creeks in the northern portion of Midpen lands are designated as Critical Habitat for this species. May occur in coastal streams and streams tributary to San Francisco Bay with no passage barriers throughout Midpen lands. There are three CNNDB occurrences on Midpen lands. The first (EONDX #30107) encompasses all of San Gregorio Creek and its tributaries, which includes a portion of La Honda Creek OSP. The second encompasses all of Pescadero Creek and its tributaries, which includes portions of Skyline Ridge OSP and Long Ridge OSP. The third includes all of the Guadalupe River and its tributaries, which includes a portion of Sierra Azul OSP.	Present
Oncorhynchus mykiss irideus pop. 9 Steelhead – south-central California coast DPS	Fed: FT CA: None	This anadromous fish spends several years in the ocean before returning to freshwater rivers and streams to spawn. This steelhead DPS inhabits coastal stream networks from the Pajaro River south to, but not including the Santa Maria River.	Midpen lands are outside of the species' known range. The nearest CNDDB occurrence (EONDX #30263) is in Coralitos Creek and its tributaries, approximately 2 miles south of Sierra Azul OSP.	Not Expected
Spirinchus thaleichthys Longfin smelt	Fed: FC CA: ST, SSC	An anadromous fish that inhabits coastal bays, estuaries and waters near the coastline from Prince William Sound in Alaska to the Sacramento-San Joaquin Delta. Spawning occurs in freshwater streams from December – February.	May occur in sloughs within tidal marsh habitats and the lower reaches of streams tributary to San Francisco Bay within Ravenswood OSP and Stevens Creek Nature Study Area only. The nearest CNDDB occurrence (EONDX #90725) is an undated historical occurrence in Butano	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
			Creek near Pescadero, approximately 4.15 miles southwest of La Honda Creek OSP.	
		Amphibians		
Ambystoma californiense California tiger salamander	Fed: FT, CH CA: ST, WL Other: SCVHCP	A large terrestrial salamander that inhabits seasonal/semi-permanent water sources (3-4 months in duration) and adjacent upland habitat with small fossorial mammal activity in lowland grasslands, oak savannah and mixed woodlands. Range includes the Central Valley and Central Coast ranges from Colusa County south to San Luis Obispo and Kern counties from sea level to 3,460 feet (1,054 meters) in elevation with two disjunct populations within Sonoma County and Santa Barbara County. Species have been documented traveling distances up to 1 mile (Austin and Shaffer 1992).	Low probability for this species to occur on the northeastern boundary of Sierra Azul OSP only. There is one historical CNDDB occurrence (EONDX #33386) that partially overlaps Rancho San Antonio OSP, which was recorded in 1893 in Permanente Creek. The next nearest occurrence (EONDX #45839) was recorded in 1983, approximately 0.3 mile north of Sierra Azul OSP.	Possible
Rana boylii Foothill yellow-legged frog (West/Central coast clade)	Fed: None CA: SE, SSC Other: SCVHCP	A medium-sized frog that inhabits rocky, cascading streams in woodland, chaparral and coniferous forests. The current known range of the West/Central Coast clade extends south from the San Francisco Bay through the Diablo Range and down the peninsula through the Santa Cruz and Gabilan Mountains in the Coast Range east of the Salinas Valley.	May occur in rocky/cobbly streams, primarily in the southern part of Midpen lands. Occurrences are distributed throughout large portions of Midpen lands, though many are historic and are now considered extirpated. Occurrences that are now considered to be extirpated or possibly extirpated are present in Windy Hill OSP (EONDX #111878), Monte Bello and Saratoga Gap OSPs (EONDX #111819), Long Ridge OSP (EONDX #111883), Sierra Azul OSP (EONDX #111812). Sierra Azul OSP also contains three occurrences from 2000 that are presumed to be extant (EONDX #75809, #75811, and #111875). There are two historical occurrences that are presumed extant partially overlapping La Honda Creek OSP (EONDX #111879 and #111880), though their current status is unknown.	Present

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Rana draytonii California red-legged frog	Fed: FT, CH CA: SSC Other: SCVHCP	A medium-sized frog that inhabits lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation up to 4,921 feet (1,500 meters) in elevation (Jennings and Hayes 1994, Bulger et al. 2003, Stebbins 2003). Range extends from Redding to Baja California, Mexico with hybridization occurring with the California red-legged frog from the Oregon border to Marin County. Breeding occurs between November and April in standing or slow moving water with emergent vegetation, such as cattails (*Typha* spp.), tules (*Scirpus* spp.) or overhanging willows (*Salix* spp.) (Hayes and Jennings 1988). Larvae undergo metamorphosis 3 ½ to 7 months following hatching (Jennings and Hayes 1984, 1994).	A substantial portion of the lands in the northern portion of Midpen lands is within designated critical habitat. May breed in streams, ponds, and wetlands throughout Midpen lands. Species is well-distributed throughout Midpen lands. Occurrences are present within many of the individual OSPs, including Purisima Creek Redwoods OSP (EONDX #58556), La Honda Creek OSP (EONDX #104426 and #65052), Russian Ridge OSP (EONDX #76386 and #76389), Coal Creek OSP (EONDX #104881), Picchetti Ranch OSP (EONDX #111147), and Sierra Azul OSP (EONDX #111093, #44889, #111098, #28476). Numerous additional occurrences are present in the immediate vicinity.	Present
Reptiles				
Thamnophis sirtalis tetrantaenia San Francisco garter snake	Fed: FE CA: SE, FP	A colorful aquatic garter snake endemic to the San Francisco Bay Area. Distributed along the peninsula from the southern San Francisco County border south to Waddell Lagoon south of Año Nuevo. Occurs sympatrically with its primary prey, California red-legged frog. Species may hibernate near coast in fossorial mammal burrows and other refuges or remain active year-round weather permitting.	Known populations occur in aquatic habitats on Midpen lands. Specific occurrence details for this species are suppressed, but they are known to be well-distributed in stream, wetland, and pond habitats throughout the northern portion of Midpen lands.	Present
Birds				
Agelaius tricolor Tricolored blackbird (nesting colony)	Fed: BCC CA: ST, SSC Other: SCVHCP	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California. Nest in emergent vegetation within aquatic and riparian habitats. Breeds from mid-March through early August; double-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).	May forage in preserves within Midpen lands, but a low probability that nesting colonies would occur. The nearest CNDDB occurrence (EONDX #24670) was recorded in 1989 near Calero Reservoir,	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
			approximately 3.1 miles northeast of Sierra Azul OSP.	
Aquila chrysaetos Golden eagle	Fed: BGEPA, BCC CA: WL, FP	A large diurnal raptor that nests on cliffs and in large trees in open areas. Forages in open terrain including grasslands, deserts, savannahs and early successional stages of forest and shrub habitats (Kochert et al. 2002). A year-round resident in the greater Bay Area. Breeding begins in February to late May; single-brooded (Baicich & Harrison 2005)	May forage anywhere within Midpen lands. Suitable nesting habitat present in tall trees and cliff faces on Midpen lands. There are two nesting occurrences within Sierra Azul OSP, one recorded in 1984 (EONDX #110488) and the other in 2007 (EONDX #110472).	Possible
Brachyramphus marmoratus Marbled murrelet	Fed: FT, CH CA: SE	A small coastal seabird that nests in coastal trees in mature/old-growth coniferous forests. Also nests on coastal cliffs or on the ground under vegetation. Breeding begins in April (Baicich & Harrison 2005).	May nest in mature redwood forests within Midpen lands. There is one nesting occurrence recorded as recently as 2007 in Purisima Creek Redwoods OSP (EONDX #99411).	Possible
Buteo swainsoni Swainson's hawk	Fed: BCC CA: ST	Breeds in the summer in open grasslands, shrublands, woodlands, and agricultural areas throughout the Central Valley and the valleys of the Sierra Nevada in Inyo and Mono counties (England et al. 1997). Nests are built in a variety of trees and shrubs; breeding occurs from March to August and are single brooded (Baicich & Harrison 2005).	Midpen lands are outside of this species' known range. The nearest CNDDB occurrence was a nest observed in 1889 in an unknown location somewhere within Santa Clara, approximately 5.7 miles northeast of Fremont Older OSP (EONDX #91540). This occurrence is considered extirpated due to urbanization.	Not Expected
Charadrius alexandrinus nivosus Western snowy plover	Fed: FT, BCC, CH CA: SSC	Inhabits beaches, mud flats, estuaries, salt evaporation ponds and inland river channels with banks for foraging. Breeds on sandy beaches, dunes, levees, river banks and dry salt evaporation beds along the California coastline typically in areas with minimal human disturbance. San Francisco Bay is within USFWS Recovery Unit 3 (USFWS 2007). Breeding begins in March; double-brooded (Baicich & Harrison 2005).	May nest and forage in Ravenswood OSP and Stevens Creek Nature Study Area only. The nearest CNDDB occurrence was recorded as recently as 2017 in the Ravenswood Unit of Don Edwards National Wildlife Refuge (EONDX #80151), which is 0.2 mile north of Ravenswood OSP. Evidence of breeding (adults with young) was recently observed within the Stevens Creek Shoreline Nature Study Area (eBird 2020).	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Elanus leucurus White-tailed kite	Fed: None CA: FP	Inhabits grasslands, agriculture fields, oak woodlands, savannah and riparian habitats in rural and urban areas. Feeds primarily on California voles. Year-round resident of Central and Coastal California. Breeding begins in February; sometimes double-brooded (Baicich & Harrison 2005).	May nest in trees near open areas such as grasslands and marshes throughout Midpen lands. The nearest CNDDB occurrence (EONDX #63807) was recorded in 2005 along Stevens Creek, approximately 1.25 miles north of Fremont Older OSP.	Possible
Falco peregrinus anatum American peregrine falcon	Fed: Delisted, BCC CA: Delisted FP	Typically a year-round resident in California and most common along the coast. Nests on cliffs, but frequently uses human-made structures such as bridges and buildings. Nests are generally located close to water bodies with abundant avian prey. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	Specific occurrence details for this species are suppressed, but they may nest on tall cliff faces present within Midpen lands.	Possible
Haliaeetus leucocephalus Bald eagle	Fed: Delisted, BCC CA: SE, FP	Winters at lakes, reservoirs, river systems and some rangelands and coastal wetlands. Nests in large conifers near aquatic sources. Breeding begins in May; single-brooded (Baicich & Harrison 2005).	May nest in tall trees near reservoirs and other large bodies of water within Midpen lands. The nearest nesting occurrence was recorded in 2016 in near Felt Reservoir (EONDX #106677), approximately 1.25 miles northeast of Windy Hill OSP.	Possible
Laterallus jamaicensis coturniculus California black rail	Fed: BCC CA: ST, FP	Smallest of the rails; inhabits tidal marshes, freshwater wetlands and marshes. Wintering habitat similar to breeding habitat. Occurs most commonly in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass. A year-round resident of the San Francisco Bay Area. Breeding begins in March; sometimes double-brooded (Eddleman et al. 2020).	May occur in salt marsh habitats on the San Francisco Bay shoreline in Ravenswood OSP and Stevens Creek Shoreline Nature Study Area only. The nearest CNDDB occurrence was recorded as recently as 2005 in Faber-Laumeister Marsh (EONDX #63305), immediately south of Ravenswood OSP.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Rallus obsoletus Ridgway's rail	Fed: FE CA: SE, FP	Restricted to the San Francisco Bay Area. Inhabits coastal wetlands dominated by pickleweed (*Salicornia spp.*) and cordgrass (*Spartina spp.*). Wintering habitat similar to breeding habitat. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	May occur in salt marsh habitats on the San Francisco Bay shoreline in Ravenswood OSP and Stevens Creek Shoreline Nature Study Area only. There is one CNDDB occurrence recorded as recently as 2017 (EONDX #112447) within Ravenswood OSP.	Present
Riparia riparia Bank swallow	Fed: None CA: ST	Nests in colonies in vertical banks with friable soils. Breeds from April to August. Most of California's nesting colonies occur along the upper Sacramento River. Breeding begins in April; double-brooded (Baicich & Harrison 2005).	Not expected to nest, but individuals may occur throughout Midpen lands during migration. The nearest CNDDB occurrence is a historical record from 1896 located near Pescadero (EONDX #85360), approximately 4.5 miles southwest of La Honda Creek OSP.	Not Expected
Sternula antillarum browni California least tern (nesting colony)	Fed: FE CA: SE, FP	Breeds in colonies on bare soil, sand and mudflats along the California coast and the San Francisco Bay Area. Winters south to Mexico. Breeding begins in May; single-brooded (Baicich & Harrison 2005).	Not expected to nest anywhere on Midpen lands. May forage in open water channels on the San Francisco Bay shoreline within Ravenswood OSP and Stevens Creek Shoreline Nature Study Area only. The nearest CNNDB occurrence is a post-breeding foraging area identified in 1987 in a salt pond (EONDX #13020) 0.6 mile northeast of Stevens Creek Shoreline Nature Study Area. There are no documented breeding occurrences anywhere in the vicinity.	Not Expected
Mammals				
Bassariscus astutus Ringtail	Fed: None CA: FP	Small, nocturnal carnivores that feed on arthropods, rodents, lizards, amphibians, small birds, and a variety of fruits and berries. They occur in riparian, montane and coniferous woodlands, chaparral, desert and tropical habitats with rocky outcroppings, canyons, or talus slopes near open water. They make dens in rocky areas in crevices, tree hollows, dens made by other	May occur in riparian, woodland, and forested habitats within Midpen lands. The CNDDB does not track occurrences of ringtail, but Midpen lands are within the species' generally accepted range.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		animals, and occasionally human structures (Poglayen-Neuwall and Toweill 1988).		
Puma concolor Mountain lion (Southern California/Central Coast ESU)	Fed: None CA: SCT	Large, slender cats with large home ranges, requiring relatively undisturbed areas. Inhabit many different habitat types, including conifer forests, oak and riparian woodlands, scrub, chaparral, grasslands, and deserts. The Southern California/Central Coast ESU includes all populations from the San Francisco Bay Area south along the Coast Ranges, and throughout Southern California from Interstate 15 southward to the Mexico border, and eastward to the Nevada and Arizona borders (Center for Biological Diversity and the Mountain Lion Foundation 2019).	May occur anywhere within Midpen lands. The CNDDB does not track occurrences of mountain lions. The Santa Cruz Mountains are a known core habitat area for mountain lions, with the population extending to the limits of urbanization in San Mateo, Santa Clara, Santa Cruz, Contra Costa, and Alameda Counties (Center for Biological Diversity and the Mountain Lion Foundation 2019).	Present
Reithrodontomys raviventris Salt-marsh harvest mouse	Fed: FE CA: SE, FP	A small endemic, pickleweed (*Salicornia* spp.)-obligate species of tidal marshes of the San Francisco Bay Area. Requires adjacent upland tidal zones for escape cover during floods. Two recognized subspecies, *R. r. halicoetes* that inhabits San Pablo and Suisun bays and *R. r. raviventris* that inhabits the South San Francisco Bay including Corte Madera and Richmond marshes.	May occur in salt marsh habitats on the San Francisco Bay shoreline in Ravenswood OSP and Stevens Creek Shoreline Nature Study Area only. There are two CNDDB occurrences within Ravenswood OSP (EONDX #32536 and #32526) and one within Stevens Creek Shoreline Nature Study Area (EONDX #8484).	Present

Notes:

[g] **Explanation of State and Federal Listing Codes**

Federal listing codes:

- FE: Federally listed as Endangered
- FT: Federally listed as Threatened
- FPE: Federally proposed for listing as Endangered
- FPT: Federally proposed for listing as Threatened
- FPD: Federally proposed for delisting
- FC: Federal candidate species (former Category 1 candidates)
- BGEPA: Bald and Golden Eagle Protection Act

California listing codes:

- SE: State listed as Endangered
- ST: State listed as Threatened
- SCE: State candidate for listing as Endangered
- SCT: State candidate for listing as Threatened
- SCD: State candidate for delisting
- SSC: California Species of Special Concern
- FP: Fully Protected Species

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential

BCC: USFWS Bird of Conservation Concern
WL: CDFW Watch List
SC: Species of Concern (NMFS regulated species only)
SA: Included on the CDFW Special Animals List
CH: Critical Habitat (Proposed or Final) is designated

Other codes:

SCVHCP: Covered species under the Santa Clara Valley Habitat Conservation Plan

Table 5 Special-Status Fish and Wildlife Species Known to Occur or Potentially Occurring on Midpen Lands (Sensitive and Locally Rare Species)

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		Invertebrates		
Adela oplerella Opler's longhorn moth	Fed: None CA: SA	Found on serpentine soils where its hostplant, California cream cups (*Platystemon californicus*) occurs. Several isolated populations known from Sonoma County south to Santa Cruz County (USFWS 1998).	Highly range-restricted, may occur on Midpen lands in serpentine grasslands only. The nearest CNDDB occurrence was recorded in 1993 near Calero Reservoir (EONDX #88092), 2 miles northeast of Sierra Azul OSP.	Possible
Anodonta californiensis California floater	Fed: None CA: SA	A freshwater mussel known from watersheds throughout much of western North America. Found in lakes, reservoirs, and slow-moving streams with mud or sand substrates. Also found in rivers and creeks with gravel substrates. Larvae attach to a variety of native and non-native fish species and use the host fish as a means of dispersal. Significant range reductions have been documented in recent years (Cummings and Cordeiro 2011).	May occur in freshwater habitats within Midpen lands. The nearest CNDDB occurrence was recorded in 1960 in Coyote Creek (EONDX #110631), 6.75 miles northeast of Sierra Azul OSP.	Possible
Bombus caliginosus Obscure bumble bee	Fed: None CA: SA	Occurs along the Pacific Coast from southern California to southern British Columbia, with scattered records from the east side of California's Central Valley.	May occur in grassland, scrub, and sparse woodland habitats throughout Midpen lands.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
			There are three CNDDB occurrences partially overlapping the following OSPs: La Honda Creek OSP (EONDX #97964), El Sereno OSP and St. Joseph's Hill OSP (EONDX #97968), and Sierra Azul OSP (EONDX #97973). These occurrences are all at least 40 years old, and there have been no verified sightings in the greater San Francisco Bay Area in recent years (Bumblebee Watch 2020).	
Calasellus californicus An isopod	Fed: None CA: SA	A freshwater aquatic isopod, very little specific life history information is available for this species. Known historically from occurrences in Lake, Napa, and Santa Clara Counties.	May occur in freshwater habitats within Midpen lands. The nearest CNDDB occurrence was recorded in 1967 in Black Creek, just west of Lexington Reservoir (EONDX #64217), immediately north of Bear Creek Redwoods OSP.	Possible
Calicina minor Edgewood blind harvestman	Fed: None CA: SA	The Edgewood Blind Harvestman is a minute yellow-orange species with neotenic characters (juvenile characteristics retained in adulthood), such as blindness (usually confined to cave-dwelling species) and reduction in size. This species is among the world's smallest harvestmen, measuring just over 1 millimeter in body length. They are generally found under serpentine rocks, particularly in association with serpentine grassland or woodland vegetation (Ubick and Briggs 1989).	Highly range-restricted, known only from Edgewood County Park. Pulgas Ridge OSP is adjacent, but lacks any of the serpentine habitat required by this species. The nearest CNDDB occurrence was recorded in 1983 in Edgewood Park (EONDX #12858), immediately south of Pulgas Ridge OSP.	Not Expected
Danaus plexippus pop. 1 Monarch butterfly - California overwintering population	Fed: None CA: SA	Along the California Coast, overwintering roosts typically occur in wind-protected groves of eucalyptus, pine, and cypress trees within 1 kilometer of the coast. The winter migratory lifespan reaches >9 months and adults return to northern habitats in spring.	May occur in groves of trees on Midpen lands that are near the Pacific Coast. The nearest CNDDB occurrence was recorded in 1998 in a grove of trees located where Purisima Creek crosses under Highway 1 (EONDX #22934), approximately 0.25 mile west of Purisima Creek Redwoods OSP.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
*Hydrochara ricksecker*i Ricksecker's water scavenger beetle	Fed: None CA: SA	Inhabits slow-moving freshwater streams, marshes, ponds, and lakes in Sonoma, Marin, Alameda, Contra Costa, and San Mateo counties. Very little specific life history information is available for this species.	May occur in slow-moving or still freshwater aquatic habitats throughout Midpen lands. The nearest CNDDB occurrence was recorded in 1954 at the Pulgas Water Temple (EONDX #22635), approximately 1 mile west of Pulgas Ridge OSP.	Possible
Microcina edgewoodensis Edgewood Park micro-blind harvestman	Fed: None CA: SA	A nocturnal arachnid with long, thin legs and small oval bodies. Inhabits xeric, open grasslands under serpentine rocks adjacent to scrub oaks. Known from Edgewood County Park.	Highly range-restricted, known only from Edgewood County Park. Pulgas Ridge OSP is adjacent, but lacks any of the serpentine habitat required by this species. There is one CNDDB occurrence recorded in Edgewood Park in 1987 (EONDX #58437) that partially overlaps Pulgas Ridge OSP.	Not Expected
Microcina homi Hom's micro-blind harvestman	Fed: None CA: SA	A small arachnid known only from scattered occurrences in Santa Clara County. Found almost exclusively under rocks in serpentine habitats (Briggs and Ubick 1989).	Midpen lands are outside of this species' known range. The nearest CNDDB occurrence was recorded in 1966 (EONDX #58617), 3.5 miles northeast of Sierra Azul OSP.	Not Expected
Speyeria adiaste adiaste Unsilvered fritillary butterfly	Fed: None CA: SA	The unsilvered fritillary butterfly is a medium-sized butterfly with a wingspan of approximately 2 inches. They occur in grasslands, chaparral, and oak woodlands where their host plant (*Viola* sp.) are present. The species nectars on thistles and California buckeye (*Aesculus californica*). They are uncommon and thought to be declining in numbers.	May occur within Midpen lands in grasslands, chaparral, and woodlands where their host plant is present. There is one CNDDB occurrence recorded in 1992 along Skyline Boulevard (EONDX #49979) that partially overlaps Long Ridge OSP.	Possible
Tryonia imitator Mimic tryonia (=California brackishwater snail)	Fed: None CA: SA	Inhabits perennial brackish water sources including coastal lagoons, estuaries and salt marshes. Ranges from Sonoma County south to San Diego County. Exhibits high salinity tolerance (Kellogg 1985).	May occur in salt marsh habitats at the lowermost reaches of coastal streams and streams tributary to San Francisco Bay on Midpen lands.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
			The nearest CNDDB occurrence was recorded in 2004 near Pescadero (EONDX #60250), 5.8 miles southwest of La Honda Creek OSP.	
		Amphibians		
Aneides niger Santa Cruz black salamander	Fed: None CA: SSC	Found in mesic forest habitats, often in or near streams. Known only from woodlands in the Santa Cruz Mountains.	Known populations on Midpen lands. May occur in woodland and forest habitats. CNDDB occurrences of this species are well-distributed throughout Midpen lands, with numerous records present within or partially overlapping the following OSPs: La Honda Creek, Russian Ridge, Monte Bello, Pichetti Ranch, Saratoga Gap, El Sereno, St. Joseph's Hill, Bear Creek Redwoods, and Sierra Azul.	Present
Dicamptodon ensatus California giant salamander	Fed: None CA: SSC	Occur in mesic coastal forests including oak woodland and coniferous forests. May also be found in coastal chaparral. This species breeds in perennial or semi-perennial cold-water streams. They are found from Sonoma County south to Santa Cruz County.	Known populations on Midpen lands. May occur in woodland and forest habitats. CNDDB occurrences of this species are well-distributed throughout Midpen lands, with numerous records present within or partially overlapping the following OSPs: Purisima Creek Redwoods, Tunitas Creek, El Corte de Madera Creek, La Honda Creek, Skyline Ridge, Monte Bello, Long Ridge, Saratoga Gap, El Sereno, St. Joseph's Hill, Bear Creek Redwoods, and Sierra Azul.	Present
Taricha rivularis Red-bellied newt	Fed: None CA: SSC	Found primarily in coastal redwood forests, but may also use Douglas fir, tan oak, and madrone forests. Breed in moderate to fast-flowing mountain streams with rocky substrates. They are known from coastal northern California from Humboldt county south to Sonoma County. One disjunct population in the Stevens	Known population present on Midpen lands. Likely restricted to the Stevens Creek watershed. There is one CNDDB occurrence located within Monte Bello OSP (EONDX #104569), and a second occurrence immediately south of Monte Bello OSP (EONDX #104574). These records represent	Present

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		Creek watershed in Santa Clara County has also been documented.	the entirety of the recently discovered disjunct population in Stevens Creek.	
		Reptiles		
Anniella pulchra Northern California legless lizard	Fed: None CA: SSC	A small legless lizard measuring up to 7 inches in length with shovel-shaped nose and blunt tail. Displays distinct coloration: a bright silver dorsal surface with a yellowish underbelly and a single black dorsal stripe. Feeds on a variety of insects, beetles, and arachnids. Inhabits sandy or loose loamy soils and leaf litter from Contra Costa County to northwestern Baja. Occurs in moist warm loose soil with plant cover. Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Leaf litter under trees and bushes in sunny areas and dunes stabilized with bush lupine and mock heather often indicate suitable habitat (Nafis 2020).	There is no sandy dune habitat present on Midpen lands. The nearest CNDDB occurrence is a historical record from 1949 that was located at an unspecified location in San Jose (EONDX #107112). This occurrence is considered extirpated, as the entire area is now highly urbanized.	Not Expected
Emys marmorata Western pond turtle	Fed: None CA: SSC Other: SCVHCP	A moderate sized freshwater turtle that inhabits permanent or nearly permanent bodies of water and low gradient slow moving streams below 6,000 feet elevation. Range extends from Washington to the northern Bay Area counties along the Pacific slope drainages. Two recognized subspecies: the northwestern pond turtle (*E. m. marmorata*) which ranges north of the American River and the southwestern pond turtle (*E. m. pallida*) which ranges from the coastal areas south of San Francisco. Subspecies interbreed within the gradation zone that defines the two subspecies.	There are known populations present within Midpen lands. May occur in ponds and large streams throughout Midpen lands. CNDDB occurrences of this species are well-distributed throughout Midpen lands, with records present within or partially overlapping La Honda Creek OSP, Bear Creek Redwoods OSP, and Sierra Azul OSP.	Present
Phrynosoma blainvillii Blainville's horned lizard	Fed: None CA: SSC	A dorsoventrally flattened lizard with several spiny dorsal scales and backward projecting spines on the head. Inhabits a variety of habitats including scrub,	May occur in scrub, grassland, and woodland habitats with sandy or gravelly substrates on Midpen lands.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		chaparral, grasslands and woodlands with sandy to gravelly substrate from Shasta County to Los Angeles County within the Sacramento and San Joaquin Valleys and neighboring foothills. Active from April-October, peaking in April/May. Diet consists of native ants and beetles, but may also feed on other insects that are seasonally abundant.	The nearest CNDDB occurrence was recorded in 2009 near Calero Reservoir (EONDX #81581), approximately 3.8 miles northeast of Sierra Azul OSP. There are also recent reliable observations of this species in Rancho San Antonio OSP (iNaturalist 2020).	
		Birds		
Accipiter cooperii Cooper's hawk	Fed: None CA: WL	Inhabits dense stands of oak woodlands, riparian deciduous forests, or other forest habitats often near water and suburban areas. Hunts in broken woodlands and along forest edges. Breeding begins in April; single-brooded (Baicich & Harrison 2005).	May nest in woodland and forest habitats throughout Midpen lands. The nearest CNDDB occurrence was recorded in 2003 along Calabazas Creek in a heavily urbanized area in Cupertino (EONDX #53907), approximately 1.75 miles northeast of Fremont Older OSP.	Possible
Accipiter striatus Sharp-shined hawk	Fed: None CA: WL	Prefers to nest on north-facing slopes in dense stands of deciduous, conifer and mixed hardwood trees, including ponderosa pine, black oak, and Jeffrey pines, preferably in riparian areas; also known to nest in suburban areas. Species attracted to rural and suburban areas especially near bird feeders often during winter months (Bildstein and Meyer 2020). It forages primarily for small birds along woodland edges and openings, hedgerows, brushy pastures, and shorelines. Breeding begins in April; single-brooded (Baicich and Harrison 2005).	May occasionally nest in dense forest and woodland habitats within Midpen lands. There are no CNDDB records of nesting sharp-shinned hawk anywhere within or in the vicinity of Midpen lands. This species is typically only present in the Bay Area during the winter, and very rarely nests in the region.	Possible
Ammodramus savannarum Grasshopper sparrow	Fed: None CA: SSC	Uncommon and local summer resident and breeder in foothills and lowlands west of the Cascade-Sierra Nevada crest from Mendocino and Trinity counties south to San Diego County (Zeiner et al. 1990). Prefer short to medium-height, moderately open grasslands with scattered shrubs (Shuford and Gardali 2008).	May nest in grasslands throughout Midpen lands. There are no CNDDB records of nesting grasshopper sparrow anywhere within or in the vicinity of Midpen lands, though they are likely under-reported. They are considered to breed	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		Grasshopper sparrows build nests domed with grasses and with a side entrance, typically well-concealed in depressions at the base of grass clumps with the rim approximately level to the ground (Vickery 1996).	within Santa Clara, San Mateo, and Santa Cruz Counties (Shuford and Gardali 2008).	
Ardea alba Great egret (nesting colony)	Fed: None CA: SA	A large wading bird that inhabits a variety of aquatic habitats including shores, tidal flats, marshes, swamps, ponds, lakes, rivers and streams. Nests colonially in large trees near water bodies. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	May form nesting colonies in tall trees in the vicinity of large water bodies on Midpen lands. The nearest CNDDB occurrence was recorded in 2011 in Almaden Lake Park (EONDX #110547), approximately 2.7 miles north of Sierra Azul OSP.	Possible
Ardea herodias Great blue heron (nesting colony)	Fed: None CA: SA	A large wading bird that inhabits a variety of aquatic habitats including shores, tidal flats, marshes, swamps, ponds, lakes, rivers and streams. Nests colonially in large trees near water bodies. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	May form nesting colonies in tall trees in the vicinity of large water bodies on Midpen lands. The nearest CNDDB occurrence was recorded in 2018 in Almaden Lake Park (EONDX #110525), approximately 2.7 miles north of Sierra Azul OSP.	Possible
Asio flammeus Short-eared owl	Fed: None CA: SSC	Inhabits open grasslands, prairies, marshes and agricultural fields with sufficient vegetative cover and abundant small mammal prey. Nests on the ground in a shallow depression. Breeds in Great Basin, Sacramento-San Joaquin Delta, San Joaquin Valley, and isolated areas along the southern California Coast (Shuford and Gardali 2008). Breeds from March through July; single-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).	May nest in salt marshes and open grasslands on Midpen lands. The nearest CNDDB occurrence was recorded in 1977 in salt marshes along the bay shore (EONDX #25537), 4.3 miles northwest of Ravenswood OSP.	Possible
Asio otus Long-eared owl	Fed: None CA: SSC	Inhabits riparian and live oak woodlands near meadows and forested habitats. Occurs in dense conifer stands at higher elevations. An uncommon species in the San Francisco Bay Area. Breeds from March to July.	May nest in woodland and forest habitats throughout Midpen lands. There is one CNDDB occurrence recorded in 1987 (EONDX #22494) that covers a large area primarily within Monte Bello OSP, and partially overlapping Skyline Ridge OSP, Coal Creek OSP, Russian Ridge OSP, and Los Trancos OSP.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Athene cunicularia Burrowing owl	Fed: BCC CA: SSC Other: SCVHCP	Valley bottoms and foothills with low vegetation and fossorial mammal activity. Listing includes wintering observations with/without a burrow in San Francisco, Ventura, Sonoma, Marin, Napa and Santa Cruz counties. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	May occur in grasslands and other open habitats throughout Midpen lands. Recent CNDDB occurrences are present in Purisima Creek Redwoods OSP (EONDX #114464), La Honda Creek OSP (EONDX #114466), and Russian Ridge OSP (EONDX #114467). These are all wintering or migratory occurrences, with no breeding documented.	Present
Chaetura vauxi Vaux's swift	Fed: None CA: SSC	In California, this species primarily nests in cavities in large-diameter redwood trees, snags, and stumps. May occasionally nest in chimneys as well (Shuford and Gardali 2008).	May occur in redwood forests within Midpen lands. There are no nearby CNDDB occurrences of nesting Vaux's swift, though this species is likely under-reported. They are considered to breed within Santa Clara, San Mateo, and Santa Cruz Counties (Shuford and Gardali 2008).	Possible
Circus hudsonius Northern harrier	Fed: None CA: SSC	Inhabits both freshwater and saltwater marshes and adjacent upland grasslands. Nests on the ground in tall grasses in grasslands and meadows. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	May nest in salt marshes and open grasslands on Midpen lands. The nearest CNDDB occurrence was recorded in 2004 in salt marsh habitat adjacent to Palo Alto (EONDX #61145), approximately 0.5 mile south of Ravenswood OSP.	Possible
Conotopus cooperi Olive-sided flycatcher	Fed: BCC CA: SSC	Inhabits open canopy late-successional coniferous forests and eucalyptus groves in foothill canyons. Prefers edge habitats and openings often associated with clear-cuts, burned areas, slashings, and fragmented forests. Nests in willows, alders, oaks and eucalyptus trees within lowlands (Shuford and Gardali 2008).	May nest along habitat edges in woodland and forest habitats throughout Midpen lands. There are no CNDDB occurrences of nesting olive-sided flycatchers anywhere in the vicinity of Midpen lands, though this species is likely under-reported. They are considered to breed within Santa Clara, San Mateo, and Santa Cruz Counties (Shuford and Gardali 2008).	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Coturnicops noveboracensis Yellow rail	Fed: BCC CA: SSC	Highly secretive, breeds in northeastern California in wet meadows and sedge marshes. Winters in tidal marshes in the greater San Francisco Bay Area.	May occur on Midpen lands in salt marsh habitats on the San Francisco Bay shoreline only. There is one CNDDB occurrence recorded in 1988 partially overlapping Ravenswood OSP (EONDX #107074). Another historical occurrence from 1901 (EONDX #106959) partially overlaps Stevens Creek Nature OSP.	Possible
Cypseloides niger Black swift	Fed: BCC CA: SSC	Breeds in areas with cliff faces, on coasts or inland in canyons. Nests are in sheltered crevices or ledges near seeps and waterfalls. Breeding begins in May. Single brooded (Baicich & Harrison 2005).	The extremely specific nesting habitat for this species, bluffs and steep-walled canyons near waterfalls, may not occur within Midpen lands. The nearest CNDDB occurrence was recorded in 1973 in New Almaden (EONDX #1232), approximately 0.6 mile east of Sierra Azul OSP. The breeding status of this species in the region is uncertain. Known nesting locations along the coast in San Mateo and Santa Cruz Counties appear to be extirpated, and nesting has not been documented in these counties since 1988 (Shuford and Gardali 2008).	Not Expected
Egretta thula Snowy egret (nesting colony)	Fed: None CA: SA	Inhabits shallow estuaries, marshes, ponds, rivers and wetlands. Breeds in rookeries near water in trees often in dense thickets or protected areas. Breeding season varies, typically begins in mid-April in California; single-brooded (Baicich & Harrison 2005).	May form nesting colonies in tall trees in the vicinity of large water bodies on Midpen lands. The nearest CNDDB occurrence was recorded in 2011 in Almaden Lake Park (EONDX #110548), approximately 2.7 miles north of Sierra Azul OSP.	Possible
Geothlypis trichas sinuosa San Francisco common yellowthroat	Fed: BCC CA: SSC	Year-round resident of the San Francisco Bay Area. Inhabits dense vegetation in wetlands, marshes, estuaries, prairies and riparian areas of San Francisco and San Pablo bays, and along the coastal areas of Marin, San Francisco, and San Mateo Counties (Shuford and Gardali 2008). Breeds from mid-March to	May occur in salt marsh habitats within Midpen lands. There is one CNDDB occurrence recorded in salt marsh habitat along the bay shore (EONDX #59820) that partially overlaps Ravenswood OSP.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		late July; double-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).		
Lanius ludovicianus Loggerhead shrike	Fed: BCC CA: SSC	Common resident and winter visitor in lowlands and foothills throughout California. Loggerhead shrikes breed mainly in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground. They require tall shrubs or trees (but also use fences or power lines) for hunting perches, territorial advertisement, and pair maintenance; open areas of short grasses, forbs, or bare ground for hunting; and large shrubs or trees for nest placement (Shuford and Gardali 2008).	May occur in grassland and shrubland habitats throughout Midpen lands. There are no CNDDB occurrences of nesting loggerhead shrikes anywhere in the vicinity of Midpen lands, though this species is likely under-reported. They are considered to breed throughout Santa Clara, San Mateo, and Santa Cruz Counties (Shuford and Gardali 2008).	Possible
Melospiza melodia pusillula Alameda song sparrow	Fed: BCC CA: SSC	The Alameda song sparrow occurs only in tidal marshes along San Francisco Bay south from El Cerrito through the shorelines of Alameda, Santa Clara, San Mateo, and San Francisco Counties (Shuford and Gardali 2008).	May nest in salt marsh habitats within Midpen lands along the San Francisco Bay shoreline. There is one CNDDB occurrence recorded in salt marsh habitat along the bay shore (EONDX #60617) that partially overlaps Ravenswood OSP.	Possible
Nycticorax nycticorax Black-crowned night heron (nesting colony)	Fed: None CA: SA	Colonial nester in sites near fresh, brackish, or salt water in all types of vegetation; also in marshes in *Phragmites*, cattails, grass tussocks, and *Scirpus*. Breeding begins in winter to April; usually single-brooded (Baicich & Harrison 2005).	May form nesting colonies in tall trees in the vicinity of large water bodies on Midpen lands. The nearest CNDDB occurrence was recorded in 2018 in Almaden Lake Park (EONDX #110533), approximately 2.7 miles north of Sierra Azul OSP.	Possible
Pandion haliaetus Osprey	Fed: None CA: WL	Inhabits rivers, lakes and coastal habitats. Nest in tall trees near water bodies with sufficient prey. Range is almost cosmopolitan throughout California. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	May nest in tall trees or utility towers on Midpen lands near reservoirs or the San Francisco Bay shoreline. There are three nesting occurrences all recorded in 2006 (EONDX #64907, #64908, and #64909) within approximately 0.5 mile south of Sierra Azul OSP. All three are generally associated with large reservoirs.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
Phalacrocorax auratus Double-crested cormorant (nesting colony)	Fed: None CA: WL	Rookery sites are located near large water bodies and on small islands, shorelines, and cliff ledges. Nest consists of a structure of twigs and plant material in a tree or tall manmade structures. Breeding begins in early March to mid-June; single-brooded (Baicich & Harrison 2005).	May nest in tall trees and large utility towers on Midpen lands along the San Francisco Bay shoreline only. The nearest CNDDB occurrence was recorded in 2004 in an electrical tower in salt marsh habitat (EONDX #58226) approximately 6 miles northwest of Ravenswood OSP. Nesting has also been documented in the electrical towers along the Dumbarton Bridge, immediately adjacent to Ravenswood OSP, as recently as 2008 (Adkins et al 2010).	Possible
Progne subis Purple martin	Fed: None CA: SSC	Nests in tall, old trees near a body of water in open forests, woodlands, & riparian habitats. Forages in valley foothills, meadows, grasslands, montane hardwood, riparian habitats, closed-cone pine-cypress, ponderosa pine, Douglas fir, & redwood forests. Breeding begins in March; primarily single-brooded (Baicich & Harrison 2005).	Known population present on Midpen landsat Mt. Umunhum. Likely restricted to this area only. There is one occurrence of this species located at the historic radar structure on Mt. Umunhum within Sierra Azul OSP (EONDX #94365). This well-studied population has been documented nesting at this location as recently as 2017 (Airola et al. 2018).	Present
Rynchops niger Black skimmer (nesting colony)	Fed: BCC CA: SSC	Black skimmers nest on levees and islands in salt ponds and marshes of San Francisco Bay. Breeding for this species in San Francisco Bay has been documented only from 1994. Breeding begins early-May. Single brooded (Baicich & Harrison 2005).	No islands suitable for nesting are present on Midpen lands. The nearest CNDDB occurrence was recorded in 2015 on an island in Shoreline Sailing Lake (EONDX #102320), approximately 1.3 miles west of Steven Creek Shoreline Nature Study Area.	Not Expected
Setophaga petechia Yellow warbler	Fed: BCC CA: SSC	Nests in dense, shrubby thickets dominated by willows along water courses and wet meadows. They build nests in a variety of riparian trees, most commonly willows (*Salix* spp.) and cottonwoods (*Populus* spp.). Occasionally yellow warblers breed in mixed-conifer forests with shrubby understories (Shuford and Gardali 2008). Breeds from April to late July and is sometimes	May nest in riparian woodlands throughout Midpen lands. There are no nearby CNDDB occurrences of nesting yellow warbler, though this species is likely under-reported. They are considered to breed locally and in small numbers in San Mateo,	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		double-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).	Santa Clara, and Santa Cruz Counties (Shuford and Gardali 2008).	
Spinus lawrencei Lawrence's goldfinch	Fed: BCC CA: SA	Lawrence's goldfinch breeding range extends along the western foothills of the Sierra Nevada and the Coast Ranges from Shasta County, California south to northern Baja California. Breeds primarily in open woodlands with chaparral, tall annual weed fields, and open water in the vicinity. Nest trees are predominantly live oaks and blue oaks. Less frequently breeds in chaparral, riparian woodland, coastal scrub, open conifer forests, and rural areas. Likely require water within 0.5 kilometers of nesting sites (Watt et al. 2020).	May nest in open woodlands near water throughout Midpen lands. There are no nearby CNDDB occurrences of nesting Lawrence's goldfinch, though this species is likely under-reported.	Possible
Mammals				
Eumops perotis Western mastiff bat	Fed: None CA: SSC	Inhabits various types of open, semi-arid to arid habitats, including coastal and desert scrublands, annual and perennial grasslands, conifer and deciduous woodlands. They primarily roost in crevices in vertical cliffs, usually granite or consolidated sandstone, and in broken terrain with exposed rock faces; they may also be found occasionally in high buildings, trees and tunnels. Roost sites may change from season to season. Due to its large size, this bat needs vertical faces to drop from in order to take flight. Nursery roosts are found in tight rock crevices with mating taking place in the spring. They are active yearlong, limited only when temperatures drop below 41 degrees Fahrenheit.	Suitable habitat consists of extensive open areas with potential roost locations having vertical faces to drop off from and take flight, such as crevices in rock outcroppings and cliff faces, tunnels and tall buildings. The distribution is not completely known; however, this species ranges from San Francisco across to the Sierra Nevada and south, encompassing the southern half of the state. There are no CNDDB occurrences of western mastiff bat in the vicinity of Midpen lands.	Not Expected
Antrozous pallidus Pallid bat	Fed: None CA: SSC	Inhabits rocky terrain in open areas in lowlands, foothills and mountainous areas near water throughout California below 2,000 meters. Roost in caves, rock crevices, mines, hollow trees, buildings and bridges in arid regions in low numbers (<200). Active from March-	Suitable habitat is present in woodland and forest habitats, as well as human-made structures throughout Midpen lands. CNDDB occurrences of this species are well-distributed throughout areas adjacent to the	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		November; migrates in some areas, but may hibernate locally.	Midpen lands. The nearest occurrence was recorded in 1960 in Woodside (EONDX #66770), approximately 0.5 mile east of Teague Hill OSP.	
Corynorhinus townsendii Townsend's big-eared bat	Fed: None CA: SSC	An obligate cave rooster and moth specialist. Inhabits caves and mines, but may also use bridges, buildings, rock crevices and tree hollows in coastal lowlands, cultivated valleys and nearby hills characterized by mixed vegetation throughout California below 3,300 meters. Exhibits high site fidelity and is highly sensitive to disturbance. Forages along edge habitats near water; may travel long distances during foraging bouts.	Suitable habitat is present in woodland and forest habitats, as well as human-made structures throughout Midpen lands. CNDDB occurrences are well-distributed throughout Midpen lands, with occurrences located within or partially overlapping La Honda Creek OSP, Skyline Ridge OSP, Pichetti Ranch OSP, Bear Creek Redwoods OSP, and Sierra Azul OSP.	Possible
Dipodomys venustus venustus Santa Cruz kangaroo rat	Fed: None CA: SSC	A burrowing rodent that inhabits open chaparral areas in coastal mountains of west-central California. Historically occurred from San Mateo and Santa Clara Counties south to San Benito County. The only known extant population is in the Mount Hermon region of Santa Cruz County (Brylski 1998).	May occur in open chaparral habitats with friable soils within Midpen lands, though the status of this species in the region is unknown. There are no CNDDB occurrences on Midpen lands, though historical records are present in the region (Brylski 1998).	Possible
Erethizon dorsatum North American porcupine	Fed: None CA: SA	Range throughout the Sierra Nevada Mountains and Coast Ranges, generally in forested habitats.	There are no recent sightings of this species anywhere near Midpen lands, and it is likely extirpated from the region. The nearest occurrence is a historical record from 1937 (EONDX #107893), 3 miles southwest of Bear Creek Redwoods OSP.	Not Expected
Lasiurus blossevillii Western red bat	Fed: None CA: SSC	Primarily associated with intact riparian habitat; species is ubiquitous throughout most of California except the northern Great Basin region. Roosts individually in foliage within trees along riparian areas, orchards and suburban areas. Favors cottonwoods, willows, sycamores, and walnut trees (Western Bat	May roost in trees within riparian areas, woodlands, and forest habitats throughout Midpen lands. There are no CNDDB occurrences of western red bat in the vicinity of Midpen lands, though this species is likely under-reported.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		Working Group 2020). Feeds primarily on moths, but will eat a variety of other insects.		
Lasiurus cinereus Hoary bat	Fed: None CA: SA	Ubiquitous throughout California. Roosts solitarily in foliage. Prefers evergreens, but will use deciduous trees in forested habitats, particularly in edge habitat (Western Bat Working Group 2020). May forage in small to large groups. Feeds primarily on moths, but will eat a variety of other insects. Migrates great distances.	May roost in trees within riparian areas, woodlands, and forest habitats throughout Midpen lands. CNDDB occurrences are well-distributed throughout Midpen lands and the surrounding vicinity, with occurrences located within or partially overlapping La Honda Creek OSP and Windy Hill OSP.	Possible
Myotis evotis Long-eared myotis bat	Fed: None CA: SA	Typically inhabits brushy woodland habitats and coniferous forests up to 2,800 meters throughout California except the Central Valley and deserts. Roosts in a variety of habitats including exfoliating bark, tree hollows, caves, rotten stumps, snags, cliff crevices and bridges. A foliage gleaner that requires nearby water.	Suitable habitat is present in woodland and forest habitats, as well as human-made structures throughout Midpen lands. There are no CNDDB occurrences of long-eared myotis within or in the vicinity of Midpen lands, though this species is likely under-reported.	Possible
Myotis thysanodes Fringed myotis bat	Fed: None CA: SA	Exhibits a strong roosting preference for large trees and snags, but will use buildings, caves, rock crevices, etc., if necessary. Inhabits a variety of woodland, scrub and grassland habitats up to 2,850 meters throughout California except for Central Valley and southern deserts. Forages great distances and is active during winter months. Highly sensitive to human disturbance.	Suitable habitat is present in woodland and forest habitats, as well as human-made structures throughout Midpen lands. There are no CNDDB occurrences of fringed myotis within or in the vicinity of Midpen lands, though this species is likely under-reported.	Possible
Myotis Volans Long-legged myotis bat	Fed: None CA: SA	Primarily occurs in coniferous forests, but also occurs seasonally in riparian and desert habitats. Most common in woodland and forest habitats above 1200 m (4000 ft). Also forages in chaparral, coastal scrub, Great Basin shrub habitats, and in early successional stages of woodlands and forests. Roosts under exfoliating bark in small groups, but may also use rock crevices, cliffs	Suitable habitat is present in woodland and forest habitats, as well as human-made structures throughout Midpen lands. There are no CNDDB occurrences of long-legged myotis within or in the vicinity of Midpen lands, though this species is likely under-reported.	Possible

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
		and human-made structures in absence of old growth trees. Forages aerially around the forest canopy.		
Myotis yumanensis Yuma myotis bat	Fed: None CA: SA	A riparian obligate species. Ubiquitous throughout California. Inhabits riparian areas near permanent water sources. Roosts in a variety of habitats including bridges, buildings, caves, mines, cliff crevices and trees. Forages above water and in riparian areas.	Suitable habitat is present in woodland and forest habitats, as well as human-made structures throughout Midpen lands. The nearest CNDDB occurrence was recorded in 2001 along Stevens Creek (EONDX #62396), 1.4 miles east of Rancho San Antonio OSP.	Possible
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	Fed: None CA: SSC	Inhabits chaparral, coastal scrub, oak woodland, and riparian woodland in the San Francisco Bay Area. They exhibit high site fidelity and may live in the same nest community for generations. Nest structures are key indicator of their presence and are easily identified by their large, conical appearance. Species is typically not associated with urban areas due to lack of suitable native woodland plants used for foraging, and increased predation pressure from feral and domestic cats.	This species is ubiquitous in oak and riparian woodlands and may occur in those habitats throughout Midpen lands. The nearest CNDDB occurrence was recorded in 2007 along Highway 92 (EONDX #70792), approximately 0.1 mile north of Miramontes Ridge OSP.	Present
Sorex vagrans halicoetes Salt-marsh wandering shrew	Fed: None CA: SSC	Species is restricted to salt marshes in San Francisco Bay. Feeds mainly on invertebrates and some plant material within a low, dense cover of pickleweed (*Salicornia* spp.). Most young are born March to May. Maximum lifespan is about 16 months.	May occur in salt marsh habitat on Midpen lands along the San Francisco Bay shoreline. The nearest CNDDB occurrence was recorded in 1961 immediately north of the western landing of the Dumbarton Bridge (EONDX #24355), and immediately north of Ravenswood OSP.	Possible
Taxidea taxus American badger	Fed: None CA: SSC	A large mustelid that inhabits open areas with friable soils within woodland, grassland, savannah and desert habitats. A fossorial mammal that preys predominately on ground squirrels (*Ammospermophilus* and *Spermophilus* spp.) and pocket gophers (*Thomomys* spp.). Mating occurs in late summer; young are born in March and April (Jameson and Peeters 2004).	This species ranges widely and may occur throughout Midpen lands. There are numerous CNDDB occurrences well-distributed within and adjacent to Midpen lands. Occurrences are present within or partially overlapping Purisima Creek, La Honda Creek,	Present

Species Name Common Name	Listing Status [a]	Habitat Requirements and Additional Notes	Habitat Suitability and Local Distribution	Occurrence Potential
			Windy Hill, Russian Ridge, Skyline Ridge, Monte Bello, and Los Trancos OSPs.	

Notes:

[h] **Explanation of State and Federal Listing Codes**

Federal listing codes:

- FE: Federally listed as Endangered
- FT: Federally listed as Threatened
- FPE: Federally proposed for listing as Endangered
- FPT: Federally proposed for listing as Threatened
- FPD: Federally proposed for delisting
- FC: Federal candidate species (former Category 1 candidates)
- BGEPA: Bald and Golden Eagle Protection Act
- BCC: USFWS Bird of Conservation Concern
- SC: Species of Concern (NMFS regulated species only)
- CH: Critical Habitat (Proposed or Final) is designated

California listing codes:

- SE: State listed as Endangered
- ST: State listed as Threatened
- SCE: State candidate for listing as Endangered
- SCT: State candidate for listing as Threatened
- SCD: State candidate for delisting
- SSC: California Species of Special Concern
- FP: Fully Protected Species
- WL: CDFW Watch List
- SA: Included on the CDFW Special Animals List

Other codes:

- SCVHCP: Covered species under the Santa Clara Valley Habitat Conservation Plan

Appendix 4.4c Special-Status Wildlife Species Descriptions

Special-Status Wildlife Species Descriptions

Invertebrates

Bumble Bee Species

There are three special-status bumble bee species whose ranges include Midpen lands. Two of them, the western bumble bee (*Bombus occidentalis*) and the Crotch bumble bee (*Bombus crotchii*), are candidates for listing as endangered under the California Endangered Species Act. The third, the obscure bumble bee (*Bombus caliginosus*), is included on CDFW's Special Animals List. Specific habitat requirements for each of these species are not fully understood, but they are generally thought to nest underground or in decaying wood (CDFW, 2019). All three of these bumble bee species may occur in grassland, scrub, or open woodland on Midpen lands.

Smith's Blue Butterfly (*Euphilotes enoptes smithi*)

The Smith's blue butterfly is a federally listed endangered species. It is primarily known from dune habitats along Monterey Bay, but has also been found in chaparral and grasslands where its hostplants, coast buckwheat *(Eriogonum latifolium*) and seacliff buckwheat (*E. parvifolium*) are present. The adult flight period is approximately from mid-June to September (USFWS 2006).

A population of Smith's blue butterflies was reported along Loma Prieta Road in the southern portion of Sierra Azul OSP as recently as 2000, though its current status is unknown. They may occur in this area, but are not expected to occur anywhere else on Midpen lands.

Bay Checkerspot Butterfly (*Euphydryas editha bayensis*)

The bay checkerspot butterfly is a federally listed threatened species. They are medium-sized butterflies, with an approximately 2-inch wingspan, with a brown base color and distinct red, yellow and white checkered pattern forming rows separated by black bands. They are restricted to open grasslands with serpentine and similar soils supporting larval and adult host plants. Larval host plants include the dwarf plantain (*Plantago erecta*), owl's clover (*Castilleja densiflora*), purple owl's clover (*Castilleja exserta*), and Indian paintbrush (*Castilleja affinis*). They also require variability in slope and aspect to accommodate favorable feeding conditions and larval development due to variations in weather conditions and plant senescence. The adult flight season generally occurs from late February to early May, lasting approximately 10 days. Eggs are laid in small masses numbering up to 250, which are deposited at the base *P. erecta* or *C. affinis*. Eggs hatch in approximately ten days and feed on the host plant for a few weeks prior to entering diapause in nearby soil cracks or under rocks until the following spring (Black and Vaughan 2005). The Bay checkerspot is restricted to six localities in San Francisco (San Bruno Mountain State and County Park), San Mateo (Edgewood County Park and El Corte de Madera) and Santa Clara (Kirby, Metcalf, San Felipe, and Silver Creek Hills) counties (USFWS 1998).

A documented population of bay checkerspot butterflies and designated Critical Habitat (USFWS 2008) are present in Edgewood County Park, which is located immediately adjacent to Pulgas Ridge OSP. Pulgas Ridge OSP does not have any mapped serpentine grasslands, but due to its proximity to a known population, bay checkerspot butterflies may occur there occasionally. Serpentine grasslands are also mapped in Sierra Azul OSP and St. Joseph's Hill OSP, though the species has not been documented at either of these locations.

Monarch Butterfly (*Danaus plexippus*)

The monarch butterfly is included on CDFW's Special Animals List, and is under review by USFWS for listing under the Federal Endangered Species Act (though it is not yet formally a candidate for listing). Successive generations of monarchs make long-distance migrations to the same overwintering sites year after year. The western population of monarchs breeds in areas with its host plants, milkweeds (*Asclepias* spp.), throughout the United States west of the Rockies (Brower 1995), but virtually all of the overwintering sites used by the western population are located along the California coast, from northern Mendocino County south to San Diego County. The majority of overwintering sites are located within 1.5 miles of the Pacific Coast or San Francisco Bay, in areas of dense tree cover where the butterflies are protected from the wind (Xerces Society 2017). Typical overwintering sites are found near natural watercourses, and include areas at or near sea level in shallow canyons, gullies, or the leeward side of hills, where a combination of dense tree canopy, vegetation cover, and local topography provide strong wind protection (Lane 1993). Dense canopy cover also provides insulation from cold temperatures and protection from winter rains, both of which can cause lethal freezing in monarchs (Anderson and Brower 1996).

Ravenswood OSP and Stevens Creek Nature Study Area are both located on the San Francisco Bay shoreline, but lack any wind-protected tree groves and are therefore do not contain suitable habitat for overwintering monarch butterflies. The westernmost portions of Miramontes Ridge OSP, Purisima Creek Redwoods OSP, and Tunitas Creek OSP are the only areas on Midpen lands that are in close enough proximity to the Pacific Coast to be suitable for overwintering monarchs. Wintering aggregations may occur in wind-protected groves of trees within these areas, but are not expected elsewhere on Midpen lands.

Unsilvered Fritillary Butterfly (*Speyeria adiaste adiaste*)

The unsilvered fritillary butterfly is included on CDFW Special Animal's List. They are medium-sized butterflies with a wingspan of approximately 2 inches. They occur in grasslands, chaparral, and oak woodlands where their host plants (*Viola* sp.) are present. They have been observed nectaring on California buckeye *(Aesculus californica*) and various species of thistle (Asteraceae) (USFWS 2011a). A population of unsilvered fritillary butterflies was previously known from an area along Skyline Boulevard immediately adjacent to Long Ridge OSP, though its current status is unknown. Unsilvered fritillary butterflies may occur on Midpen lands in grasslands, chaparral, and woodland habitats, but only in locations where their host plants are present.

Opler's Longhorn Moth (*Adela oplerella*)

The Opler's longhorn moth is included on CDFW's Special Animals List. They are small, dark-colored moths with an approximately half-inch wingspan and notably long antennae. Nearly all

known populations are restricted to serpentine grassland habitats where their host plant, California cream cups (*Platystemon californicus*), occurs (USFWS 1998). Opler's longhorn moth may occur in serpentine grassland habitats on Midpen lands, but only in association with populations of its host plant.

Freshwater Aquatic Invertebrates

There are three freshwater invertebrate species included on CDFW's Special Animals List that may occur on Midpen lands: the California floater mussel (*Anodonta californiensis*), the freshwater isopod (*Calasellus californicus*), and the Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*). These species are all relatively under-studied, but are understood to inhabit lakes, ponds, and slow-moving streams.

These species have all been observed previously in the region, though the current status of their populations is unknown. Lacking any further specific information, it is assumed that these species may occur in freshwater habitats such as lakes, ponds, and streams throughout Midpen lands.

Fish

Anadromous Salmonids

Two special-status salmonid fish species may occur in creeks within Midpen lands: California central coast Distinct Population Segment (DPS) steelhead (*Oncorhynchus mykiss irideus*), a federally listed threatened species, and central coast Evolutionarily Significant Unit (ESU) coho salmon (*Oncorhynchus kisutch*), a federally and state-listed endangered species. Adults of both species are oceanic, returning to rivers and large streams to spawn. Critical Habitat for steelhead and coho salmon has been designated in streams that are within or immediately adjacent to several OSPs (NOAA Fisheries 1999, 2005b). Both of these species may occur in streams with no downstream passage barriers throughout Midpen lands.

Amphibians

California Tiger Salamander (*Ambystoma californiense*)

The Central California DPS of California tiger salamander is a federally and state-listed threatened species. They are large terrestrial salamanders that inhabit seasonal/semi-permanent water sources (3-4 months in duration) and adjacent upland habitat with small fossorial mammal activity in lowland grasslands, oak savannah, and mixed woodlands. Larvae develop in vernal pools and ponds, then metamorphose and move into uplands. They enter burrows, typically those made by small mammals, and then spend the vast majority of their lives underground (Trenham et al. 2001, USFWS 2017). Adult Central California tiger salamanders engage in mass migrations during a few rainy nights per year, typically from November through April, although migrating adults have been observed as early as October and as late as May. During these rain events, adults leave their underground burrows and return to breeding ponds to mate and will then return to their underground burrows. Upland habitats surrounding known Central California tiger salamander breeding pools are usually dominated

by grassland, oak savanna, or oak woodland (USFWS 2017). Suitable habitat for California tiger salamander is present in grassland, scrub, and sparse woodlands throughout Midpen lands, although based on the locations of known populations in the region the only area where they have any probability of occurring is along the northeastern edge of Sierra Azul OSP.

Foothill Yellow-legged Frog (*Rana boylii*) (West/Central Coast Clade)

The west/central coast clade is one of six recognized genetically distinct populations of the foothill yellow-legged frog, and is a state-listed Endangered species. This clade ranges south from the San Francisco Bay through the Diablo Range and down the peninsula through the Santa Cruz and Gabilan Mountains in the Coast Range east of the Salinas Valley (CDFW, 2019). They inhabit small to moderately-sized, perennial streams characterized by cobble-rocky substrate and shallow, flowing water in valley-foothill riparian, hardwood-conifer, mixed conifer, coastal scrub, mixed chaparral, and wet meadow communities (Hayes and Jennings 1988, Jennings 1988). Foothill yellow-legged frog populations may require both mainstem and tributary habitats for long-term persistence. Streams too small to provide breeding habitat may be critical as seasonal habitats, such as in winter or during the hottest part of the summer (VanWagner 1996). They are infrequent in habitats where introduced fish and bullfrogs are present (Jennings and Hayes 1994). Foothill yellow-legged frogs may occur in rocky or cobbly streams on Midpen lands, and are most likely to occur in Sierra Azul OSP and the surrounding area based the locations of known extant populations.

There are several historical occurrences of foothill yellow-legged frog within Midpen lands, ranging from the 1930's through the early 1970's, though most are considered extirpated or possibly extirpated. There are occurrences recorded in 2000 in the eastern part of Sierra Azul OSP (EONDX ##75809, #75811, and #111875), and there are additional occurrences recorded in 2015 (EONDX #105942) and 2019 (EONDX #6177) immediately southwest of Sierra Azul OSP in Soquel Creek. Foothill yellow-legged frogs may occur in rocky or cobbly streams within Midpen lands, and are most likely to occur in Sierra Azul OSP and the surrounding area based the locations of known populations.

California Red-Legged Frog (*Rana draytonii*)

The California red-legged frog is a federally listed threatened species and a California Species of Special Concern. California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and man-made ponds, and ephemeral drainages in valley bottoms and foothills up to 1,500 meters (4,921 feet) in elevation (Jennings and Hayes 1994, Bulger et al. 2003). Adults breed in a variety of aquatic habitats, while larvae and metamorphs use streams, deep pools, backwaters of streams and creeks, ponds, marshes, sag ponds, dune ponds, and lagoons. In a study of upland movements, California red-legged frogs moved from 1 to 71 meters from aquatic habitats, averaging 24 meters. Individuals were found within a variety of refugia including ground squirrel burrows at the bases of trees or rocks, logs, grass thatch, crevices, cow hoof prints, and a downed barn door, while others were associated with upland sites lacking refugia. Uplands closer to aquatic sites were more often used and were more commonly associated with areas having abundant sources of cover (e.g., small woody debris, rocks, and vegetation) (Tatarian 2008). The California red-legged frog is well-distributed throughout Midpen lands and adjacent areas. Furthermore, much of northern portion of Midpen lands falls within designated Critical Habitat for the species (USFWS 2010).

They may breed in aquatic habitats including ponds, wetlands, and slow-moving streams, and move into upland areas of any habitat type for refuge and dispersal.

California Giant Salamander (*Dicamptodon ensatus*), Santa Cruz Black Salamander (*Aneides niger*), and Red-Bellied Newt (*Taricha rivularis*)

The California giant salamander, Santa Cruz black salamander, and red-bellied newt are all California Species of Special Concern. They have similar habitat requirements, occupying wet forest habitats in or near perennial or semi-perennial streams (Thomson et al. 2016).

Records of California giant salamander and Santa Cruz black salamander are well-distributed in the region, and these two species may occur in streams and adjacent riparian, woodland, and forest habitats throughout Midpen lands.

Red-bellied newts are known to occur from Humboldt County south to Sonoma County, with the exception of a single, disjunct population in the upper reaches of Stevens Creek along the southern edge of Monte Bello OSP. Red-bellied newts may occur in the vicinity of this isolated population, but are not expected anywhere else on Midpen lands.

Reptiles

San Francisco Garter Snake (*Thamnophis sirtalis tetrataenia*)

The San Francisco garter snake is a federally and state-listed endangered species, and a California Fully Protected Species. They are a highly aquatic subspecies restricted to the San Francisco Peninsula, ranging from the southern San Francisco County border south to Waddell Lagoon south of Año Nuevo, and as far east as Crystal Springs Reservoir. They occur sympatrically with their primary prey, California red-legged frogs. San Francisco garter snakes prefer densely vegetated habitats close to water where they can retreat when disturbed (Stebbins 2003). The species often occurs near ponds, marshes, streams, and other wetlands associated with cattails (*Typha* spp.), bulrushes (*Amphiscirpus*, *Bolboschoenus*, *Isolepis*, *Schoenoplectus*, and *Trichophorum* spp.) and rushes (*Juncus* and *Eleocharis* spp.). They may hibernate near the coast in fossorial mammal burrows and other refuges, or remain active year-round weather permitting. San Francisco garter snakes are generally known to occur in the northwestern portion of Midpen lands, within the San Mateo County line. They may occur in ponds, streams, and wetlands throughout this are

Western Pond Turtle (*Actinemys marmorata*)

The western pond turtle is a California Species of Special Concern. They are habitat generalists, occurring in slow-moving rivers and streams, lakes, reservoirs, permanent and ephemeral wetlands, stock ponds, and sewage treatment ponds. They prefer aquatic habitat with refugia, such as undercut banks and submerged vegetation, and they require exposed basking sites such as mud banks, rocks, logs, root wads, and mats of vegetation to thermoregulate their body temperature (Holland 1994, Thomson et al. 2016). They move into uplands to dig nests and disperse to other aquatic habitats. Nest sites are most often situated on south or west-facing slopes, are sparsely vegetated with short grasses or forbs, and are scraped in sands or hard-packed, dry, silt, or clay soils. Nests may be dug very close to the water's edge, but have also

been reported as far as 500 meters from the nearest water (Rathbun et al. 1992, Holland 1994, Reese and Welsh 1997). Western pond turtles may occur in ponds, lakes, large streams, and wetlands throughout Midpen lands.

Blainville's Horned Lizard (*Phrynosoma blainvillii*)

Blainville's horned lizard is a California Species of Special Concern. They occur in open areas with sandy soil and low vegetation in valleys, foothills, and semiarid mountains. The species is associated with a variety of habitat types, including grasslands, coniferous forests, woodlands, and chaparral. Key habitat elements are loose, fine soils with a high sand fraction, an abundance of native ants, open areas for basking, and areas with low shrubs for refuge (Thomson et al. 2016). Blainville's horned lizards may occur in woodlands, shrublands, and grasslands with loose soils on Midpen lands.

Birds

Overview

Several other special-status birds, including raptors, passerines, waterfowl, and wading birds could occur within the Midpen lands. Due to the diversity of species, special-status birds could occur in any of the habitats present within the Midpen lands. Bird species that are listed under the federal or California Endangered Species Acts, or are California Fully Protected Species, are described in detail below.

Tricolored Blackbird (*Agelaius tricolor*)

The tricolored blackbird is a state-listed threatened species. Tricolored blackbirds are highly colonial and have been reported to breed in groups exceeding 100,000 nests. In most years, the Central Valley supports greater than 90% of all breeding individuals, with smaller colonies present in the Coast Ranges, Southern California, and northeastern California (Shuford and Gardali 2008). They nest in dense vegetation near open water, suitable foraging areas providing adequate insect prey within a few kilometers of the colony (Beedy and Hamilton 2020). No breeding colonies are known from within Midpen lands, though they could occur in thick vegetation within or near open water throughout the area.

Golden Eagle (*Aquila chrysaetos*)

The golden eagle is a California Fully Protected Species, a USFWS Bird of Conservation Concern, and receives protection under the federal Bald and Golden Eagle Protection Act. They use nearly all terrestrial habitat types in the western U.S. (Kochert et al. 2002). However, in central California, they prefer open grasslands and oak savanna, with lesser numbers in oak woodland and open shrublands (Hunt et al. 1998). Hilly or mountainous country where takeoff and soaring are supported by updrafts is generally preferred to flat habitats (Johnsgard 1990). Golden eagles require large patches of unfragmented natural landscapes as habitat. In addition, they are relatively intolerant of human activity and other sources of anthropogenic disturbance (Kochert et al. 2002). Golden eagles may nest nearly anywhere that suitable nesting substrates (tall trees, cliff faces, large utility towers) are present on Midpen lands.

Marbled Murrelet (*Brachyramphus marmoratus*)

The marbled murrelet is a federally threatened and state-listed endangered species. They are small coastal seabirds that nest in coastal trees in mature/old-growth coniferous forests. In California, they are most often found nesting in old-growth redwood trees (Baicich & Harrison 2005).

Marbled murrelets have been observed nesting in Purisima Creek Redwoods OSP, and a very small sliver of land in this OSP falls within designated marbled murrelet Critical Habitat Unit CA-13 (USFWS 2011b). Marbled murrelets may occur in mature redwood and conifer forests on Midpen lands.

White-Tailed Kite (*Elanus leucurus*)

The white-tailed kite is a California Fully Protected Species. They typically occur in grassland, wetland, oak woodland, and savannah habitats, as well as in riparian habitats adjacent to open areas. They may nest in single isolated trees or in trees that are part of larger stands. They require open areas for foraging, and often hunt in agricultural areas (Dunk 2020). White-tailed kites may nest in woodland and riparian areas near open habitats throughout Midpen lands.

American Peregrine Falcon (*Falco peregrinus anatum*)

The American peregrine falcon is a California Fully Protected Species and a USFWS Bird of Conservation Concern. They typically nest on cliffs, rocky outcrops, or human-made structures such as bridges, buildings and other tall, prominent structures, and feed primarily on birds captured in flight (Baicich and Harrison 2005). Peregrine falcons may nest on cliff faces on Midpen lands.

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a state-listed endangered species, a California Fully Protected Species, a USFWS Bird of Conservation Concern, and receives protection under the federal Bald and Golden Eagle Protection Act. Bald eagles inhabit forested areas adjacent to large bodies of water including lakes, reservoirs, rivers, estuaries and the coastline. They are opportunistic and will feed on carrion, but actively prey on a variety of fish, mammals, and birds (Buehler 2020). Nests are built from sticks and branches in a large tree or a rocky outcrop, usually near water bodies (Baicich and Harrison 2005). Although there are no large reservoirs on Midpen lands, water bodies including Lexington Reservoir, Lake Elsman, Guadalupe Reservoir, Almaden Reservoir, and Stevens Creek Reservoir are all located immediately adjacent to OSPs. Bald eagles may nest in large trees on Midpen lands that are in the vicinity of large water bodies such as these.

Mammals

Special-Status Bats

Bats are widespread within California and may be found in any habitat. They are nocturnal, aerial predators of insects and other arthropods, and often forage over open water, marshes, and other moist, open areas where flying insects tend to congregate. Different bat species have different roosting requirements and roosts can be found in a variety of habitats and locations. Day roosts, used from sunrise to sunset, provide a protected and sheltered location for bats to

rest and sleep within a short flight to foraging areas and a site to raise their young (Erickson 2002). During the day, bats may use three types of roosts: crevices, cavities, and foliage. Crevice and cavity roosts may be found in natural and human-made features such as caves, cliffs, rock outcrops, trees, mines, buildings, bridges, and tunnels. During the breeding season (April through September), crevice and cavity roosting species typically gather in groups of mothers and young (maternity colonies) that may number in the thousands or even tens of thousands of individuals. In contrast, foliage-roosting bats may be entirely solitary or occur in groups of only a few individuals while breeding. Roosts used during the day and as maternity roosts tend to be well-hidden and require precise temperature and humidity conditions. Night roosts, which are used from approximately sunset to sunrise, are primarily sites where bats congregate to rest and digest their food between foraging bouts (Erickson 2002). Night roosts are often located in more open but protected areas such as overhangs on buildings and recessed areas on the undersides of bridges.

Several special-status bat species have the potential to occur on Midpen lands based on range, habitat, and recorded occurrences in the region, including:

- Western mastiff bat (*Eumops perotis)* – California Species of Special Concern
- Pallid bat (*Antrozous pallidus*) – California Species of Special Concern
- Townsend's big-eared bat (*Corynorhinus townsendii*) – California Species of Special Concern
- Western red bat (*Lasiurus blossevillii*) – California Species of Special Concern
- Hoary bat (*Lasiurus cinereus*) – Included on CDFW's Special Animals List
- Long-eared myotis bat (*Myotis evotis*) – Included on CDFW's Special Animals List
- Fringed myotis bat (*Myotis thysanodes*) – Included on CDFW's Special Animals List
- Long-legged myotis bat (*Myotis volans*) – Included on CDFW's Special Animals List
- Yuma myotis bat (*Myotis yumanensis*) – Included on CDFW's Special Animals List

These bat species may occur in any habitat, although riparian corridors, large trees and snags, and relatively undisturbed parts of human-made structures are generally the most suitable roost locations.

Ringtail (*Bassariscus astutus*)

The ringtail is a California Fully Protected Species. They are small, nocturnal carnivores that feed on arthropods, rodents, lizards, amphibians, small birds, and a variety of fruits and berries. They occur in riparian, montane and coniferous woodlands, chaparral, desert and tropical habitats with rocky outcroppings, canyons, or talus slopes near open water. They make dens in rocky areas in crevices, tree hollows, dens made by other animals, and occasionally human structures (Poglayen-Neuwall and Toweill 1988). Ringtail may occur in riparian, woodland, and forested habitats on Midpen lands.

Santa Cruz Kangaroo Rat (*Dipodomys venustus venustus*)

The Santa Cruz kangaroo rat is a California Species of Special Concern. They are burrowing rodents that occur in open chaparral habitats in mountainous areas of west-central California. Historically, they were known from San Mateo County south to San Benito County, with additional observations in the Mount Hamilton area of Santa Clara County. There was a notable density of observations in the sand hills of the Mount Hermon region in Santa Cruz County

(Brylski 1998). The species is thought to still be extant in the Mount Hermon area, though there are no recent observations anywhere else in its former range. Although their status in the region is unknown, Santa Cruz kangaroo rats may occur in open chaparral habitats with friable soils on Midpen lands.

San Francisco Dusky-Footed Woodrat (*Neotoma fuscipes annectens*)

The San Francisco dusky-footed woodrat is a California Species of Special Concern. The San Francisco subspecies appears to be limited to Alameda, Contra Costa, San Mateo, Santa Clara, and Santa Cruz counties (Matocq 2002). Dusky-footed woodrats are frequently found in forest habitats with moderate canopy cover and a moderate to dense understory, including riparian forests, but may also be found in chaparral habitats. They build relatively large stick nests (2-5 feet in height and 4-8 feet in basal diameter) in protected spots, such as rock outcrops, dense brush, hollow logs, or in the crotches and cavities of trees. Nests are used for cover, food storage, and rearing of young. Nests may be used by multiple generations of woodrats for 20 years or more. Woodrat nests provide cover for many other animal species, including small mammals, reptiles, amphibians, and arthropods, thereby increasing local biodiversity. Woodrats are generalist herbivores, consuming a variety of nuts, fruits, fungi, foliage and some forbs (Carraway and Verts 1991). San Francisco dusky-footed woodrats are ubiquitous in oak and riparian woodlands in the region, and may occur in those habitats as well as chaparral and other shrublands throughout Midpen lands.

Mountain Lion (Southern California/Central Coast ESU) (*Puma concolor*)

The Southern California/Central Coast ESU mountain lion is a candidate for listing as threatened under the California Endangered Species Act. They are large cats with very large home ranges that may cover many different habitat types, including conifer forests, oak and riparian woodlands, scrub, chaparral, grasslands, and deserts. They typically require areas that are relatively undisturbed by human activity. The Southern California/Central Coast ESU includes all populations from the San Francisco Bay Area south along the Coast Ranges, and in Southern California from Interstate 15 southward to the border with Mexico, and eastward to the Nevada and Arizona borders. The Santa Cruz Mountains are understood to be a core habitat area for the species, and populations extend to the limits of urbanization in San Mateo, Santa Cruz, and Santa Clara Counties (Center for Biological Diversity and Mountain Lion Foundation 2019). Although individuals occasionally wander into urban areas, they are not able to establish territories and persist in highly developed environments. Mountain lions may naturally occur in any non-urban habitats on Midpen lands.

American Badger (*Taxidea taxus*)

The American badger is a California Species of Special Concern. They occur throughout California in open habitats where their prey species are present. Characterized by a stout, muscular, compressed body adapted to digging, badgers forage on other fossorial species, such as ground squirrels and pocket gophers (Jameson and Peeters 2004). American badgers are well-distributed throughout Midpen lands and the surrounding region. They range widely and may occur in any non-urban habitat type, though they are most prevalent in grasslands and other open areas.

Tidal Marsh Species – Ravenswood OSP and Stevens Creek Shoreline Study Area

Ravenswood OSP and the Stevens Creek Shoreline Nature Study Area are both located on the San Francisco Bay shoreline, and contain tidal marsh and slough habitats that are not present on any other Midpen lands. There are several special-status species that occur only in these habitat types that are not expected to occur anywhere else on Midpen lands, and for this reason they are discussed here separately.

Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*)

The salt marsh harvest mouse is a federally and state-listed endangered species and a California Fully Protected species. It is a small rodent endemic to the salt and brackish marshes of San Francisco Bay and adjacent tidally influenced areas. They depend mainly on dense pickleweed (*Salicornia* sp.) as their primary cover and food source and may utilize a broader source of food and cover that includes saltgrass and other vegetation typically found in the salt and brackish marshes of this region. In natural systems, harvest mice can be found in the middle tidal marsh and upland transition zones. Upland refugia are an essential habitat component during high tide events (USFWS 1984). The salt marsh harvest mouse is known to be present in both Ravenswood OSP and Stevens Creek Shoreline Nature Study Area Preserve. The species may occur in tidal marshes and adjacent upland areas within both of these OSPs.

Ridgway's Rail (*Rallus obseletus*)

The Ridgway's rail is a federally and state-listed endangered species and a California Fully Protected species. They occur within tidal salt marshes dominated by pickleweed and cordgrass (*Spartina sp.*) along San Pablo Bay, Suisun Marsh, and the south and central San Francisco Bay. Nests are built on the ground and concealed by vegetation. Breeding begins in late February and continues through late August. The species is typically single-brooded, but will replace lost clutches (Baicich and Harrison 2005). Young are precocial, leaving the nest quickly after hatching and are attended by both parents. Ridgway's rail are known to be present in Ravenswood OSP. Ridgway's rail may occur in tidal marshes and adjacent upland areas within both Ravenswood OSP and Stevens Creek Shoreline Nature Study Area.

California Black Rail (*Laterallus jamaicensis coturniculus*)

The California black rail is a State-listed threatened species and a California Fully Protected species. They are year-round residents that occur throughout the San Francisco Bay, Bodega Bay, Tomales Bay, Morro Bay, and Bolinas Lagoon (Eddleman et al. 1994). Nests are built on the ground in tufts of grass or pickleweed beginning in mid-March. The breeding season lasts through mid-July and are typically single-brooded. Precocial young leave the nest within 24 hours of hatching (Eddelman et al. 2020). California black rail may occur in tidal marshes and adjacent upland areas within both Ravenswood OSP and Stevens Creek Shoreline Nature Study Area.

Western Snowy Plover (*Charadrius alexandrinus nivosus*)

The western snowy plover is a federally-listed threatened species and a California Species of Special Concern. They inhabit beaches, mud flats, estuaries, salt evaporation ponds, and inland river channels with banks for foraging. This species breeds on sandy beaches, dunes, levees, river banks and dry salt evaporation beds along the California coastline typically in areas with minimal human disturbance. San Francisco Bay is within USFWS Recovery Unit 3 (USFWS 2007). There is minimal nesting habitat for snowy plover in Ravenswood OSP, though they may

forage in mud flats at low tide. They may nest in open areas within Stevens Creek Shoreline Nature Study Area.

Green Sturgeon (*Acipenser medirostris*) – Southern Distinct Population Segment (DPS)
Southern DPS green sturgeon is a federally listed threatened species and a California Species of Special Concern. They are anadromous fish that are found in marine waters from the Bering Sea to Ensenada, Mexico. The southern DPS includes all spawning populations south of the Eel River (exclusive), principally including the Sacramento River population. Locally, green sturgeon inhabit Suisun, San Pablo, and San Francisco Bays, and coastal bays and estuaries from Monterey Bay north to Puget Sound. Spawning occurs in the Sacramento River (NOAA Fisheries 2009). The entirety of San Francisco Bay has been designated Critical Habitat for this species, including all of the tidal marsh and slough habitat in Ravenswood OSP and the portion of Stevens Creek adjacent to Stevens Creek Shoreline Nature Study Area (NOAA Fisheries 2009). Tidal sloughs in both of these OSPs may be used by green sturgeon during migration or as juvenile rearing habitat.

Longfin Smelt (*Spirinchus thaleichthys*)
Longfin smelt is a candidate for federal listing, a state-listed threatened species, and a California Species of Special Concern. They generally spawn in freshwater and then move downstream to brackish water to rear. Juvenile and adult longfin smelt have been found throughout the year in salinities ranging from pure freshwater to pure seawater, although once past the juvenile stage, they are typically collected in waters with salinities ranging from 14 to 28 parts per thousand (Baxter 1999). The known range of the longfin smelt extends from the San Francisco Bay-Delta in California northward to the Cook Inlet in Alaska. Longfin smelt may occur in tidal sloughs connected to San Francisco Bay within both Ravenswood OSP and Stevens Creek Shoreline Nature Study Area.

Alameda Song Sparrow (*Melospiza melodia pusilulla*)
The Alameda song sparrow is a California Species of Special Concern and a USFWS Bird of Conservation Concern. They are one of four subspecies endemic to the Bay Area. It is a year-round resident of tidal salt and brackish marshes from El Cerrito southward through the shorelines of Alameda, Santa Clara, San Mateo, and San Francisco Counties. The Alameda song sparrow primarily inhabits tidal channels with dense, short vegetation such as pickleweed, cordgrass, gumplant (*Grindelia stricta*), and rushes (*Juncus* spp.) Their diet consists mostly of grains with some invertebrates; therefore, exposed ground is a habitat requirement. They prefer to nest in dense vegetation, which also provides cover from predators (Shuford and Gardali 2008). Alameda song sparrows may nest in thick vegetation anywhere within Ravenswood OSP or the Stevens Creek Shoreline Study Area.

Salt Marsh Wandering Shrew (*Sorex vagrans halicoetes*)
The salt marsh wandering shrew is a California Species of Special Concern. They are small, dark-colored shrews that inhabit tidal marshes along the shoreline of San Francisco Bay from San Pablo southward. They have been found most often in middle marsh areas, 6 to 8 feet above sea level (Collins 1998). Salt marsh wandering shrews may occur in tidal marshes in both Ravenswood OSP and the Stevens Creek Shoreline Study Area.

Mimic Tryonia (*Tryonia imitator*)

Mimic tryonia is included on CDFW's Special Animals List. They are small snails, typically less than 5 millimeters in length, that occur in salt water or brackish water in coastal lagoons, creeks, sloughs, and salt marshes from Sonoma County south to San Diego County. They are found in permanent water, often associated with mats of algae (*Ulva* sp.) (Kellogg 1985). The current status of mimic tryonia in San Francisco Bay is unknown, but they have potential to occur in tidal sloughs within both Ravenswood OSP and Stevens Creek Shoreline Nature Study Area.

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Appendix 4.4d Streambed Alteration Agreement

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CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
BAY DELTA REGION
7329 SILVERADO TRAIL
NAPA, CALIFORNIA 94558
(707) 944-5500
WWW.WILDLIFE.CA.GOV

STREAMBED ALTERATION AGREEMENT

NOTIFICATION NO. 1600-2012-0444-R3
Various Creeks in San Mateo, Santa Clara and Santa Cruz Counties

Midpeninsula Regional Open Space District
SYSTEM WIDE ROUTINE MAINTENANCE AGREEMENT

This Streambed Alteration Agreement (Agreement) is entered into between the California Department of Fish and Wildlife (CDFW) and Midpeninsula Regional Open Space District as represented by Kirk Lenington (Permittee).

RECITALS

WHEREAS, pursuant to Fish and Game Code (FGC) section 1602, Permittee notified CDFW on December 21, 2012 that Permittee intends to complete the project described herein.

WHEREAS, pursuant to FGC section 1603, CDFW has determined that the project could substantially adversely affect existing fish or wildlife resources and has included measures in the Agreement necessary to protect those resources.

WHEREAS, Permittee has reviewed the Agreement and accepts its terms and conditions, including the measures to protect fish and wildlife resources.

NOW THEREFORE, Permittee agrees to complete the project in accordance with the Agreement

PROJECT LOCATION

The project sites are located in Open Space Preserves managed and/or owned by the Permittee in Santa Clara, San Mateo and Santa Cruz Counties, State of California. Project activities will be conducted in watersheds within San Mateo and Santa Clara counties including, Pilarcitos, , Purisima, Lobitos, Tunitas, Pescadero, San Gregorio and Uvas (Pajaro) which all drain into the Pacific Ocean and in watersheds that drain into San Francisco Bay including Adobe, Cordilleras, Matadero, Permanente, Saratoga, Calabazas, San Francisquito, Stevens Creek, and Guadalupe Creek (including Alamitos, San Tomas Aquinas, Ross and Los Gatos). Routine maintenance activities will occur in the following units listed below with their associated creeks, tributaries,

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springs, ponds, lakes and other waterways (not all ponds and drainages have names therefore, not all will be listed):

Santa Clara County

1. Bear Creek Redwoods- Santa Clara and Santa Cruz Counties: Dyer Creek; Webb Creek; Collins Creek; Briggs Creek; Aldercroft Creek
2. El Soreno-Santa Clara County: San Tomas Aquinas Creek; Trout Creek; Los Gatos Creek
3. Foothills-Santa Clara County: Adobe Creek
4. Fremont Older-Santa Clara County: Regnart Creek; Stevens Creek; Prospect Creek
5. Los Trancos-San Mateo County: Los Trancos Creek
6. Monte Bello-Santa Clara County: Stevens Creek; Indian Creek; Bay Creek; Goldmine Creek; Adobe Creek
7. Pichetti Ranch- Santa Clara County: Swiss Creek
8. Rancho San Antonio-Santa Clara County: Permanente Creek
9. Saratoga Gap-Santa Clara and Santa Cruz Counties: Saratoga Creek; Stevens Creek
10. Sierra Azul- Santa Clara County and Santa Cruz: Guadalupe Creek; Rincon Creek; Jacques Gulch; Austrian Gulch; Los Gatos Creek; Uvas Creek; Alamitos Creek; Hendry's creek; Pheasant Creek; Soquel Creek
11. St. Josephs Hill-Santa Clara County: Los Gatos Creek

San Mateo County

12. Coal Creek-San Mateo County: Coal Creek; Corte Madera Creek
13. El Corte de Madera-San Mateo County: El Corte de Madera; Lawrence Creek
14. La Honda Creek-San Mateo County: La Honda Creek; Harrington Creek; Bogess Creek; San Gregorio Creek
15. Long Ridge-San Mateo Counties: Peters Creek; Oil Creek; Slate Creek
16. Miramontes Ridge-San Mateo County: Madonna Creek; Mills Creek

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17. Purissima Creek Redwoods-San Mateo County: Purissima Creek; Whitemore Gulch; Soda Gulch; Lobitos Creek; Grabtown Gulch; Arroyo Leon; Walker Gulch; Rodgers Gulch
18. Pulgas Ridge-San Mateo County: Cordilleras Creek
19. Ravenswood-San Mateo County: San Francisco Bay
20. Russian Ridge- San Mateo County: Mindego Creek; Rapley Creek; Woddruff Creek
21. Skyline Ridge-San Mateo County: Alpine Lake; Lambert Creek; Peters Creek
22. Stevens Creek Shoreline Nature Study Area-San Mateo County: Stevens Creek, San Francisco Bay
23. Teague Hill-San Mateo County: Tripp Gulch; Squealer Gulch; Applettree Gulch
24. Thornewood-San Mateo County: Schilling Lake; Dennis Martin Creek
25. Tunitas Creek-San Mateo County: Kings Gulch; Tunitas Creek
26. Windy Hill-San Mateo County: Sausal Creek; Hamms Gulch; Damiani Creek; Jones Gulch; Bozzo Gulch

Santa Cruz County

Portions of Sierra Azul, Long Ridge and Bear Creek Redwoods

It is anticipated that Permittee may acquire or manage new Preserve Units during the term of this Agreement. Any new units may be added to this Agreement through the Amendment process (see Measure 1.8).

PROJECT DESCRIPTION

Under this Agreement, Permittee will conduct “routine maintenance activities”, as described below, on all of the Midpeninsula District Open Space Preserve properties. Coverage under this Agreement is extended to those activities that meet one or more of the following criteria:

a. Do not directly affect State or Federally listed species. ‘Directly affect’ means that an activity which can reasonably be expected to require an Incidental Take Permit from CDFW or take authorization from the United States Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) cannot be covered under this Agreement except as allowed under Measure 1.10.

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b. Are subject to the Agreement process contained in FGC Sections 1600 et seq. For the terms of this Agreement, this potentially includes any activities that occur in any drainage whether natural or man-made which carries flow and supports aquatic life or which is a lake or pond that has an outlet or inlet of any size or nature. Vegetation that originates within any of the areas defined here is also considered subject to Sections 1600 et.seq.

c. Is not an *emergency activity* as defined in FGC Section 1610 or a timber harvest as defined in FGC Section 1611.

d. An activity that can reasonably be considered routine maintenance. 'Maintenance' refers to generally limited tasks that occur repeatedly over time and are necessary to maintain in good condition, Preserve facilities and amenities. This includes, but is not necessarily limited to the following: repairs, replacement, and cleaning of existing facilities and infrastructure (such as roads, trails and culverts); installation of minor new structures or infrastructure undertaken to improve an existing road, trail or facility; activities such as minor grading, sediment removal or vegetation control to correct conditions that threaten or degrade natural environments (such as non-native species control, removal of trash from channels or drainage and erosion repairs and habitat enhancement). These activities are specifically defined in 'Project Description', below.

e. Will not have disproportionate impacts on fish or wildlife resources or the habitats that sustain them as a result of something specific to the project, such as location or type or length of activity. Examples of this would be projects that disturbed stream segments that supported salmonid spawning or foothill yellow-legged frog habitat or an unusually dense concentration of woodrat nests. Work shall not be conducted at locations that are considered 'sensitive' according to CEQA Guidelines, Section 15300.2(a) unless a corresponding CEQA document and associated mitigation and monitoring plan, and all other required regulatory agency permits are in place for the proposed work.

Any other activity which is subject to Fish and Game Code Sections 1600 et seq, but not coverable under this Agreement, must obtain a project specific Streambed Alteration Agreement from CDFW.

Routine maintenance activities authorized under this Agreement are limited to the following:

1. Culverts

1.1 Replacement

Replacement of any existing concrete, wood, plastic (ABS, HDPE etc.) or metal pipe

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culvert up to 48 inches inner diameter (unless authorized to be a larger diameter by CDFW) with the following restrictions:

- Work shall be done only when the channel is dry, except in perennial streams or during wet weather years in which the channel does not dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering BMPs in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. When working within wet channels there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site.
- The new culvert shall typically be as large as or larger than the existing culvert unless the original culvert was oversized or a natural obstruction such as bedrock is encountered. For anything other than an ephemeral drainage, the culvert shall be sized where feasible to convey a 100-year flow or cover the entire channel width.
- Total earthwork shall not exceed 8025 ~~25~~ cubic yards per culvert, not including any energy dissipater.
- The new culvert shall be installed at or below grade.

This category includes replacement or installation of a rock or other natural material energy dissipater for the culvert.

Authorized via Amendment 4: adding a 24-foot retaining wall to replace a section of failed perched fill and a failing culvert. The culvert replacement included approximately 28 cy of earthmoving, plus 15 cy for retaining wall construction to stabilize the banks.

1.2 Repair/Maintenance

Standard practice is to clean culverts of obstructions once they are 10-20% blocked. Culverts with recurring blockages are cleaned annually, regardless of the amount of blockage. Sediment, vegetation or debris shall be removed using handtools in creeks supporting salmonids, unless other methodology is ~~otherwise approved by CDFW in writing~~ submitted to CDFW in writing during annual project notifications. Sediment, vegetation or debris may be removed with mechanized equipment in creeks that do not provide habitat for salmonids. Removal of up to a maximum amount of five (5) cubic yards per culvert ~~when the channel is dry~~ is covered under this Agreement.

Culverts that are more than 1/3 blocked may be cleaned at any time, even during periods when the channel is wet, with the following restrictions:

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- Up to 32 ~~2~~ cubic yards of material may be removed, using hand tools only, under any conditions.
- Removal of amounts greater than 32 ~~2~~ cubic yards requires that the channel be dewatered first and heavy equipment may be used with written approval from CDFW.
- The total cumulative area of disturbance shall not exceed 150 feet of channel or 2,000 square feet of area, whichever is less.
- After completion of the work, the disturbed area shall immediately be treated with erosion control ~~materials~~ Best Management Practices (BMPs) sufficient to control turbidity and sediment loss.
- Nearby perched or otherwise unstable fill may be removed as well, up to 10 cubic yards.
- No coho salmon are present.

This category includes repairs to headwalls and energy dissipaters, assuming no mortar, concrete or chemicals will be used. This Agreement does not cover the use or installation of culvert coatings or linings.

1.3 Minor Relocation Where the Road or Trail Is Not Also Being Relocated

Relocation or replacement of a culvert with a rolling dip within 25 feet of the original location to correct poor drainage conditions or improve sediment control with the following restrictions:

- The total amount of earthwork may not exceed 8025 ~~25~~ cubic yards.
- Work shall be done only when the channel is dry, except in perennial streams or during wet weather years in which the channel does not dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering BMPs in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. When working within wet channels there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site.
- The new culvert shall be installed at or below grade and shall include an energy dissipater or downdrain as appropriate.
- Where feasible, the new culvert shall accommodate a 100-year flow or the entire channel width, whichever is greater or more feasible.
- Vegetation removal is limited to no more than a five-foot buffer around the culvert and to trimming of no more than 20% of any individual tree canopy within that five-foot buffer.

1.4 Removal of Existing Culverts Or Replacement with Rolling Dips Or Fords.

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Removal of culverts and filling in of the associated cross drain or replacement with a rolling dip or ford, with the following restrictions:

- No more than one culvert may be removed for every hundred yards of trail or road length if the culvert is in a natural channel.
- If the channel was created by the original emplacement of the culvert, any number may be removed under this Agreement.

Culvert relocation associated with trail or road relocation is covered under those categories.

1.5 New Culvert installation (Non Stream-Crossing Culverts)

New culverts may be installed to maintain existing roads and trails with the following restrictions:

- New culverts shall not be installed in streams but shall be limited to engineered drainage ditches associated with roads and trails.
- If an existing road or trail has an inadequately drained inboard ditch (excessive length between existing ditch relief culverts or dips), ~~1~~ new ditch relief culverts (where rolling dips would be insufficient) may be placed as directed by Best Management Practices and/or by the project engineer to adequately convey stormwater and reduce sediment to downstream watercourses. ~~per 200 feet of ditch not to exceed more than 1 total mile of road or trail treated per field office each year.~~
- ~~In addition, no more than eight culverts may be installed each year to be split between the two field offices varying in number per field office each year to provide drainage of a seep, spring, or redirected drainage impacting an existing road or trail in order to reduce sediment.~~

2. Bridges (includes puncheons)

2.1 Replacement and Removal

Replacement is defined as any activity that results in the removal of the entire bridge or culvert structure and then replacement with a ~~of the~~ bridge structure.

The following are covered under this Agreement:

Removal, or replacement of any size bridge in the same location, on any trail or road, where no channel entry is necessary, no work is proposed to in-channel abutments or supports and vegetation removal is limited to no more than a six-foot

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(6) buffer around the existing bridge structure and to trimming of no more than 20% of any individual tree canopy within that six-foot buffer.

Bridge replacement (not in the same location, such as higher on the bank or upstream/downstream) shall only be allowable if it reduces overall habitat impacts and/or removes the bridge completely from the stream bed, bank or channel (for example, a bridge for which the current bridge or footings are located below the ordinary high water mark) made longer to be placed above the OHWM.

Removal, or replacement of any size bridge in the same location, with limited channel entry to place fabric or other devices to catch debris or place falsework, with the following restrictions:

- Work may only occur when the channel is dry, except in perennial streams or during wet weather years in which the channel does not dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering BMPs in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. When working within wet channels there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site.
- Only very limited modifications to the channel surfaces are proposed. 'Very limited' means movement of rocks less than 8" in size, less than two hand shovels of earth, footprints and indentations caused by equipment and structures. Any modifications to correctly place falsework shall occur to the falsework rather than the channel.
- Vegetation removal is limited to no more than a six (6) foot buffer around the existing bridge structure and to trimming of no more than 20% of any individual tree canopy within that buffer.

Removal, or replacement of smaller bridges (up to six feet (6) width) on trails, as long as work is completed when the channel is dry or during periods of low flow (for perennial streams) and must adhere to the dewatering BMPs in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. ~~and~~ ~~t~~The bridge shall be ~~is~~ supported on mudsills or abutments placed outside of the channel.

2.2 Repair/Maintenance

Repair/Maintenance is replacement of bridge parts and grading for drainage correction on the approaches with the following restrictions:

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- All work shall be done from the bridge or by workers standing in the channel or on a ladder in the channel.
- A net or other device (diaper) shall be attached to the underside of the bridge to catch any debris falling from bridge.
- Pressure treated lumber shall be sealed and coated off-site. ~~Sealants shall be approved by CDFW in writing.~~ Tread material shall not be pressure treated to prevent leaching and breakdown of pressure treated materials into the waterway.
- Only minor saw work and drilling shall occur; the primary work shall occur off site.
- Grading on the approaches is limited to a maximum of 5 cubic yards per bridge. This amount is not cumulative with the culvert replacement standard of 5 cubic yards.

Relocation associated with trail or road relocation is covered under those categories.

3. Fords and Swales (Includes drain lenses and causeways)

3.1 Replacement, Repair or Maintenance

This task entails either full replacement of existing fords or repair/maintenance by replacing rock and removing sediment and woody debris with the following restrictions:

- No use of chemicals, concrete, mortar or other sealants or adhesives.
- This category applies only to narrow width trails and emergency vehicle/multi-use trails where the drainage does not support salmonids.
- The ford is not on an intermittent or perennial drainage or, if it is, the ford has been confirmed by CDFW to not be considered a barrier to the movement of aquatic organisms.
- Vegetation removal is limited to no more than a five-foot buffer around the existing ford and to trimming of no more than 20% of any individual tree canopy within the five-foot buffer only.

- All work shall be done when the channel is dry<u>, except in perennial streams or during wet weather years in which the channel does not dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering BMPs in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work.</u>
- <u>When working within wet channels there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site</u>.

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Relocation of fords associated with trail or road relocation is covered under those categories. Ford or swale replacement with culverts, bridges or small puncheons, shall be submitted to CDFW in writing through annual project notifications~~first approved by CDFW~~. If approved, Permittee shall comply with Section 1.5 and 2.1.

4. Bank Stabilization

4.1 Replacement, Repair, Maintenance

This task includes small bank and streambed erosion control projects to minimize water quality and erosion impacts. The following specific tasks are covered under this agreement:

Replacement or repair of damaged or failed sections of perched fill, rock riprap, timber pile walls, geogrid embankment and retaining walls, wooden or log cribwall bank revetments and retaining walls.

Placement of rip-rap above or below failed sections of structures to aid in integrity of those structures. Riprap of proper size and weight to withstand high water flows will be set below grade and keyed into the bank.

This activity does not include any new project sites which may need structural repair (for e.g. placement of new riprap or a new retaining wall where these structures have not been installed). Work will be confined to the damaged or failed sections and immediate adjacent bank area affected by the damage failure. No more than 40% of bank repairs in a given year will use “hard” or impervious structure design without prior consultation with DFW.

The following restrictions apply:

- Streambank areas receiving rock slope protection shall be back-filled with appropriate native or clean imported topsoil. The topsoil will fill some portions of the voids in the rock slope protection above the normal high water mark and provide a substrate for revegetation efforts. This work will be done manually using hand tools and power tools such as a toter or mule for single-track trail environments or an excavator or dump truck when needed for multi-use trails or roads.
- Other bank stabilization measures that may be employed include broadcast and hydro-seeding, riparian vegetation planting, slopes armored with rocks or sandbags staked with live willow and other bioengineering techniques such as willow staking, live willow pole drains, vegetated crib walls, log or rock weirs.
- Riparian trees shall be protected from damage to the greatest extent possible during repair and replacement.

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5. Roads and Trails

5.1 Drainage and erosion control

This task includes removal of sediment from roads and trails to improve drainage and prevent or repair erosion. The following specific tasks are covered under this Agreement:

Cleaning roadside/trailside ditches. Limited to no more than 10 cubic yards of soil per 100 yard length of road/trail. Also allows associated vegetation removal.

Slough and berm removal. Over time, use of trails and roads tends to compact and lower the road or trail surface, trapping drainage on the travel surface. This task allows for occasional removal (every 3-5 years) of that material, not to exceed 5 cubic yards per 100 yard length of ~~road/~~trail and not to exceed 10 cubic yards per 100 yard length of road.

Cleaning sediment accumulation in rolling dips. Rolling dips are only jurisdictional if they are constructed in a drainage. When this occurs, this Agreement covers removal of up to 2 cubic yards of sediment per 100 yard length of road/trail.

Landslide removal. Up to 5 cubic yards per event may be removed or up to 2 cubic yards under any conditions with the following restrictions:

- Up to 2 cubic yards of material may be removed, using hand tools only, under any conditions.
- Removal of amounts greater than 2 cubic yards requires that the channel be dewatered first and heavy equipment may be used if submitted to CDFW in writing through annual notification process ~~with written approval from CDFW~~ and where no coho salmon are present.
- The total area of disturbance shall not exceed 150 feet of channel or 2,000 square feet of area, whichever is less.
- The disturbed area shall immediately be treated with erosion control materials sufficient to control turbidity.
- Nearby perched or otherwise unstable fill shall be removed as well, up to 5 cubic yards.

5.2 Minor relocation

Minor relocation of trails and roads to improve drainage, remove paths from environmentally sensitive areas or achieve better stability.

The following restrictions apply to narrow width trails:

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- The new location shall be no more than 400' upslope or downslope of the existing location.
- New crossings shall be freespan bridges in creeks providing salmonid habitat or freespan bridges or mortar or concrete free fords in creek without salmonid habitat. New culvert installation shall not be covered under this Agreement and Permittee shall submit a separate Agreement Notification for any new stream crossing culvert installation.
- Vegetation removal is limited to no more than a six (6) foot buffer around the new crossing and to trimming of no more than 20% of any individual tree canopy in that six-foot buffer.
- All work is to be done when the work area is dry and the work period is outside the rainy season.
- Work must be completed during the allowable work periods identified in Measures 2.1 and 2.2.
- ~~Work started before October 15 shall be at least 50% complete by October 15 of any year and shall be completed by October 31 or until the immediate project area receives the first significant rainfall (defined as 0.5 inch of rain in a 24-hour period).~~

The following restrictions apply to relocation of other trails and roads.

- The new location must be no more than 400' upslope or downslope of the existing location
- The total amount of earthwork may not exceed 75~~25~~ cubic yards.
- New crossings shall be freespan bridges in creeks providing salmonid habitat or freespan bridges or mortar or concrete free fords in creeks without salmonid habitat.
- If a new culvert will be used for stream crossings, Permittee shall submit a separate Agreement Notification for installation activities. Culvert installation activities will not be covered under this Agreement.
- All work is to be done when the work area is dry, except in perennial streams or during wet weather years in which the channel does not dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering BMPs in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. When working within wet channels there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site. ~~and the work period is outside the rainy season (see work windows in Measures 2.1 and 2.2).~~
- ~~Work started before October 15 shall be at least 50% complete by October 15 of any year and shall be completed by October 31 or until the immediate project area receives the first significant rainfall (defined as 0.5 inch of rain in a 24-hour period).~~

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- Vegetation removal is limited to no more than a five-foot buffer around the new crossing and to trimming of no more than 20% of any individual tree canopy with the five-foot buffer.

6. Ponds and Lakes

6.1 Berm Repairs/Maintenance

Berm Repairs/Maintenance are defined as any activity that results in the repair or maintenance of an existing earthen berm structure either through vegetation clearing or minor earthwork. This task includes filling in low spots on the berm surface and removal of woody vegetation on berm faces.

The following are covered under this Agreement:

Repair of smaller scale earthen berms that are not regulated by the Division of Dam Safety and on five ~~four~~ berms meeting the Division of Dam Safety criteria for regulated facilities including berms at: Alpine Pond and Horseshoe Lake in Skyline Ridge Open Space Preserve, Lower and Upper Turtle ponds, ~~and at four unnamed ponds at~~La Honda Creek Open Space Preserve, and at Mindego Lake in Russian Ridge Open Space Preserve. Berm repairs may only be completed with the following restrictions:

- Berm repairs are confined to existing berm structures and may not involve relocation or upsizing of any existing berms.
- Berm repairs shall adhere to the terms and conditions of the USFWS Recovery Permit Number: TE225974-2, dated 12/22/16, and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander" dated April 6, 2017. ~~may only occur where no entry into the wetted channel shall occur.~~
- Vegetation removal is limited to existing berm top, face, and no more than a six (6) foot buffer around the existing berm or any additional areas requested by the Division of Dam safety (outside of the above parameters).

6.2 Outlet Repairs/Maintenance

Repair of existing human made outlet channels and pipes associated with small scale earthen berms in order to remove blockages, replace failing or undersized outlet channels or pipes, to remove accumulated vegetation or sediment, or to place erosion control with the following restrictions:

- Work may only occur when ~~the channel is dry~~ adhering to the terms and conditions of the USFWS Recovery Permit Number: TE225974-2, dated 12/22/16, and CDFW Memorandum of Understanding "Research and

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Recovery of San Francisco Garter Snake and California Tiger Salamander" dated April 6, 2017.

- Vegetation removal is limited to no more than a six (6) foot buffer around the existing channel and may not extend into nearby natural drainages. Limited vegetation removal may occur on the pond access road to provide safe equipment access to the pond site.
- No more than 200 feet of channel or 60 feet of pipe can be repaired in each location using this provision. The 200 feet at each location includes the sum of both banks.
- A secondary outlet pipe may be installed to provide an emergency overflow in the event of blockage of the primary pond outlet/spillway.

6.3 Pond Basins Repairs/Maintenance

Repair of pond basins to remove accumulated sediment, invasive vegetation or to improve aquatic habitat conditions. Basin repairs may only be completed with the following restrictions:

- Basin repairs involving earthwork or re-contouring may only occur when the pond is dry or when following the terms and conditions of the USFWS Recovery Permit Number: TE225974-2, dated 12/22/16, and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander" dated April 6, 2017.
- Basin repairs are confined to existing pond footprint and may not involve relocation or upsizing of any existing ponds.
- Vegetation removal is limited to ~~invasive~~ vegetation (including native species) having a detrimental impact to aquatic habitat conditions within the existing pond basin and banks.
- Wetland vegetation removal is limited to that caused by direct removal of built up ~~targeted invasive~~ vegetation or sediment removal or to allow access to the pond basin for re-countouring.

6.4 Trash cleanup

This task includes removal of non-natural materials from jurisdictional lakes, ponds and channels under the following restrictions:

- ~~No h~~Hazardous materials may only be removed under ~~this Agreement.~~the professional guidance of a hazardous materials consultant with notification to both CDFW and the Regional Water Quality Control Board.
- All work is to be done with hand tools, including come-along cable pullers, except that vehicle mounted winches may be used to remove collected or very heavy materials from the channel.

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- Vegetation removal is limited to that caused by direct removal or minor trimming to allow access to the channel or material to be removed.
- Access points may be opened no more than every 50 yards to remove materials. No grading and only limited vegetation removal shall take place to open an access point.

7. Water supply facilities and structures

Removal of vegetation around water intakes, tanks and other water supply infrastructure (including springs), is limited to a 30-100 foot buffer based on local fire agency defensible space requirement around each structure and/or to perform routine maintenance on these facilities.

8. Vegetation removal to maintain trails, roads or staging areas, picnic or rest areas that are subject to the requirements of this permit.

This task includes removal of vegetation for the following:

Removal of vegetation, including root masses and trimming, where a road or trail or other surface or structure is being damaged; where plant growth blocks channels or reduces water flow; to protect water supply facilities; to allow adequate site distance for safety and aesthetic reasons; to provide emergency, maintenance, and recreational access to facilities; and to meet local fire codes; Control of invasive and non-native plants; managed livestock grazing; Mowing, mastication, and manual control; native vegetation plantings to enhance riparian and aquatic habitats and to treat disturbed area.

The following restrictions apply:

- Non-native Vegetation Removal. These activities include management of nonnative species through mowing, mastication, manual removal, bio-control (i.e. livestock or natural predator insects), shading, removal of trees that may impact facilities next to streams, ponds or bed and banks of streams, natural resources and/or water quality, and the replanting of native vegetation. Vegetation removal will not exceed 2,000 square feet at each location unless identified in the District's Integrated Pest Management Work Plan submitted annual to CDFW.

- Native vegetation plantings in habitat enhancement and restoration areas. These activities include installation of temporary irrigation, planting of locally collected native vegetation, weed control, and the installation of vegetation protective structures; and the installation of native vegetation and use of bioengineering techniques. Straw wattles, coir rolls, certified weed-free straw, erosion mats, etc. will be used to prevent erosion, minimize bank impacts,

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and prevent soil loss. If installed in an area where impacts to listed species could occur, wildlife friendly netting shall be utilized.

- There shall be no vegetation removal in excess of what is necessary to allow the level of access needed and to accommodate routine maintenance activities, passage of emergency vehicles where appropriate, and for defensible space or public safety. No vegetation shall be removed by excavation or cutting off below the soil unless approved in writing by CDFW.

- Invasive plant material removed during work activities shall be appropriately handled in order to prevent spread of invasive species including the following:

  Suitable onsite disposal areas shall be identified to prevent the spread of weed seeds.

  Invasive plant material shall be rendered nonviable when being retained onsite. Permittee shall desiccate or decompose plant material until it is nonviable. Depending on type of plant, disposed plant material can be left out in the open as long as roots are not in contact with moist soil, or can be covered with a tarp to prevent material from blowing or washing away.

  Permittee shall monitor all sites where invasive plant material is disposed on-site and treat any newly emerged invasive plants.

  When transporting invasive plant material off-site for disposal, the plant material shall be contained in enclosed bins, heavy duty bags, or a securely covered truck bed. All vehicles used to transport invasive plant material shall be cleaned after each use.

- ~~Wetland or standing water areas shall not be cleared under this category.~~

9. Fire control

This task includes maintenance of defensible space buffers in jurisdictional areas around buildings, staging areas, roads, trails, and use areas.

10. Habitat enhancement activities not specifically covered above.

10.1 Exotic plant removal

This task includes removal of exotic plants using methods approved in the District's Integrated Pest Management Program, including but not limited to: grazing, hand

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tools, equipment (mechanized mowers, tractor drawn mowers). ~~No chemical removal is proposed.~~

- ~~This task does not include exotic plant removal by fire.~~

10.2 Infill Planting

This task includes any amount of native plant or habitat restoration using ~~hand tools~~ those methods identified in the District's Integrated Pest Management Program and local plant materials.
11. Instream large woody debris installation following the BMPs in Exhibit B is permissible for the following purposes:

- To provide habitat for salmonids or other aquatic species
- To control streambank incision
- To restore floodplain
- To store sediment
- To mitigate for LWD removal elsewhere in the stream to protect infrastructure

PROJECT IMPACTS

Because of the broad geographic area covered by the Midpeninsula Open Space District, it is possible that a very wide range of sensitive species and/or habitats could be encountered while undertaking the routine maintenance activities. The California Natural Diversity Database lists 109 separate elements for Santa Clara County, 131 for San Mateo County, and 113 for Santa Cruz County at the time of the preparation of this Agreement. These include threatened and endangered species as well as Species of Special Concern (SSC) and species considered rare by other organizations, such as the California Native Plant Society (CNPS). Existing fish or wildlife resources the routine maintenance activities could potentially substantially adversely affect include but are not limited to: San Francisco dusky-footed woodrat (SFDW), a species listed as SSC; California red-legged frog (CRLF) a SSC and a species listed as threatened under the Endangered Species Act (ESA); San Francisco garter snake (SFGS), a species listed as endangered under ESA and under the California Endangered Species Act (CESA) and fully protected under Section 5050 of the FGC; Western pond turtle (WPT) a SSC; steelhead, a threatened species under ESA and a SSC; coho salmon, a species listed as endangered under ESA and CESA; marbled murrelet listed as endangered under CESA and threatened under ESA , saltmarsh harvest mouse, listed as fully protected under FGC and endangered under ESA and CESA; Mt. Hamilton fountain thistle a CNPS 1B.2 species; western leatherwood, a CNPS 1B.2 species; Loma Prieta hoita, a CNPS 1B.1 species; popcorn flower; nesting birds; roosting bats; water quality and riparian vegetation.

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The adverse effects the project could have on the fish or wildlife resources identified above include: potential increase in sediment transport during project activities; increase in turbidity during project activities; disruption to nesting and migratory birds from project activities; temporary impacts to riparian habitat through vegetation removal which could reduce foraging and nesting habitat for birds; temporary loss or impediment of terrestrial animal species travel routes due to temporary structures; temporary loss of riparian habitat; loss of emergent vegetation; and disturbance to wildlife associated with construction noise.

MEASURES TO PROTECT FISH AND WILDLIFE RESOURCES

1. Administrative Measures

Permittee shall meet each administrative requirement described below.

1.1 Documentation at Project Site. Permittee shall make the Agreement, any extensions and amendments to the Agreement, and all related notification materials and California Environmental Quality Act (CEQA) documents, readily available at the project site at all times and shall be presented to CDFW personnel, or personnel from another state, federal, or local agency upon request.

1.2 Providing Agreement to Persons at Project Site. Permittee shall provide copies of the Agreement and any extensions and amendments to the Agreement to all persons who will be working on the project at the project site on behalf of Permittee, including but not limited to contractors, subcontractors, inspectors, and monitors.

1.3 Notification of Conflicting Provisions. Permittee shall notify CDFW if Permittee determines or learns that a provision in the Agreement might conflict with a provision imposed on the project by another local, state, or federal agency. In that event, CDFW shall contact Permittee to resolve any conflict.

1.4 Project Site Entry. Permittee agrees that CDFW personnel may enter the project site at any time to verify compliance with the Agreement.

1.5 Additional Measures. As a result of any field inspection, CDFW may require that additional measures be applied to specific activities to protect sensitive biological resources. Such measures may be amended into this Agreement with the agreement of both parties, or if an exception to authorized activities is identified, Permittee may be

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asked to submit separate written notification to CDFW pursuant to Condition 1.7, below.

1.6 Authorized Routine Maintenance Activities. Only those activities specifically described in the Project Description shall be conducted under this Agreement.

1.7 Exceptions to Authorized Activities. Permittee shall submit separate written notification (Forms FG 2023 and FG 2024) pursuant to Section 1602 of the FGC, together with the required fee prescribed in the CDFW Streambed Alteration Agreement fee schedule, and otherwise follow the normal notification process prior to the commencement of work activities in all cases where one or more of the following conditions apply:

- The proposed work does not meet the criteria established for routine maintenance activities in the Project Description of this Agreement;
- The nature of the proposed work is substantially modified from the work described in the Project Description of this Agreement;
- CDFW advises Permittee that conditions affecting fish and wildlife resources have substantially changed at a specified work site or that such resources would be adversely affected by the proposed maintenance activity.

1.8 New Preserves. Permittee may add new Preserves to this Agreement by applying for a formal amendment. The Notification should describe the new unit, provide a map and discuss the likely maintenance needs of the unit. CDFW will review the material to determine if the expected routine maintenance activities associated with the new unit are consistent with the terms of this RMA. If they are, the proposed unit will be added to the RMA.

1.9 Exhibit B. Exhibit B shall be updated as warranted on an annual basis with the annual notification.

1.10 Unauthorized Take. This Agreement does not authorize the take of any State or federally listed threatened species, endangered species, or candidate species. Projects that may cause impacts to or take of one or more listed species may be allowed under this Agreement provided incidental take coverage has been received from all agencies with which the species has/have been listed.

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Notification of inclusion of a project that could cause a take of a listed species shall take place during the yearly project submittal due by February 1. If take coverage has not been approved but is imminent, the project may be approved by CDFW, but work may not proceed until written authorization has been granted by each approving agency. If CDFW determines, or Permittee finds that there are such species on the work site, Permittee shall notify CDFW, US Fish and Wildlife Service (USFWS), and/or National Oceanic Atmospheric Association, National Marine Fisheries Service (NMFS) as appropriate. Permittee shall immediately cease work until CDFW and other applicable agencies deem that the concern over special status species has been resolved. If take authorization has not been granted or is not imminent, additional analysis under CEQA may be necessary and the project should not be submitted to CDFW for coverage under this Agreement.

1.11 CNDDB Forms. If any sensitive species are observed in project surveys, the Permittee shall submit California Natural Diversity Data Base (CNDDB) forms to the CNDDB for all pre-construction survey data annually ~~within five working days of the sightings~~, and provide CDFW Bay-Delta Region with copies of the GIS data and associated metadata. ~~CNDDB forms and survey maps.~~

2. Avoidance and Minimization Measures

To avoid or minimize adverse impacts to fish and wildlife resources identified above, Permittee shall implement each measure listed below.

2.1 Seasonal Work Period for Salmonids. Work within and around National Oceanic and Atmospheric Administration Fisheries designated critical habitat for steelhead and coho ~~creeks that provide habitat for salmonids~~ shall be limited to June 15 to October 31. Re-vegetation is not confined to this period. See Map in Exhibit B.

2.2 Alternative Seasonal Work Period. Work within and around creeks that do not provide habitat for salmonids and reaches that are 1,000 feet or more upstream of discharge points ~~which do not discharge directly~~ into such drainages shall be limited to April 15 to October 31, or is permissible from November 1 to April 14 under the following conditions:

- Work may not occur until the site has received no rainfall for a period of 10 days and there is no rain in the forecast for a

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period of 7 or more days, and work requires no greater than 5 days to complete.

- Work started during this period must be at least 50% complete within 2.5 days of beginning work.
- Winterization materials must be on hand and installed if unanticipated rainfall begins (defined as 0.5 inches of rain in a 24-hour period).
- Corrective actions are allowable year-round for the following situations:
    - To correct improperly installed and/or unauthorized work on District lands that occurred during the same calendar year that is resulting in sediment delivery.
    - To correct damage from winter storms that threatens access to homes, ponds, water systems, and other critical infrastructure.

~~Re-vegetation is not confined to this period.~~

2.3 Completion by End of ~~Seasonal~~ Work Period. No project shall be initiated unless there is high confidence it can be completed before the end of the ~~seasonal~~ work windows designated in Measures 2.1 and 2.2. "Completed" includes installation of any erosion and drainage control features. After September 15 of each year, projects that have not been started, ~~or~~ are still underway, or meet the conditions in Section 2.2 shall be evaluated to ensure they can be completed before the end of the applicable ~~seasonal~~ work window. Those projects unlikely to be completed before the end of the ~~seasonal~~ work windows shall not be started or shall be winterized to be completed in the following year.

2.4 Weather Forecast. Permittee shall monitor the seventy-two hour forecast from the National Weather Service (*http://www.nws.noaa.gov* and https://www.accuweather.com). When there is a forecast of more than 40% chance of rain, or at the onset of unanticipated precipitation, the Permittee shall remove all equipment from the creek zone, shall implement erosion and sediment control measures, and all Project activities shall cease.

2.5 Dry Out Period. No work shall occur during a dry out period of 24 hours after there has been ¼ inch or more of precipitation.

2.6 No Equipment in Wetted Areas. No equipment shall be operated within the active creek (i.e. wetted channel) except in perennial streams or during wet weather years in which the channel does not

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dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering provisions in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. When working within wet channels, there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site. ~~order to divert water around the project site if necessary. No equipment shall be operated~~ Work in ~~other~~ wetted areas such as ponds or wetlands supporting CRLF or SFGS shall adhere to the terms and conditions of the USFWS Recovery Permit Number: TE225974-2, dated 12/22/16, and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander" dated April 6, 2017. ~~without prior written approval from CDFW.~~

2.7 ~~CDFW-Approved~~ Qualified Biologist(s) and Biological Monitor(s) Definitions. ~~Within a minimum of 30 days prior to initiating species surveys within the Project area, Permittee shall submit to CDFW for approval, the names and resumes of all qualified biologists and biological monitors involved in conducting surveys and/or monitoring work.~~

A qualified biologist is an individual who shall have a minimum of five years of academic training and professional experience in biological sciences and related resource management activities, with a minimum of two survey seasons years (for e.g. two seasons during the blooming season of sensitive plants) conducting surveys for each species that may be present within the Project area.

A biological monitor is an individual who shall have academic and professional experience in biological sciences and related resource management activities as it pertains to this Project, experience with construction-level biological monitoring, be able to recognize species that may be present within the Project area, and be familiar with the habits and behavior of those species.

2.8 Designation of Work Area. Prior to Project activities, a biological monitor or qualified biologist shall clearly mark/flag or erect temporary construction fencing to designate the work area and to delineate the areas that shall be avoided. The boundaries shall be inspected on a regular basis to ensure that work has remained within the marked boundaries. If one or more boundary(ies) has/have been violated, work shall cease until Permittee has taken appropriate action to ensure there is no recurrence of the trespass. Flagging and/

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or temporary construction fencing shall be removed immediately after the completion of construction work.

2.9 Narrow Width Trail. Where necessary, Permittee may clear a narrow width trail to provide vehicular access to a work site. Vegetation removal shall be limited to the minimum amount necessary to provide access.

2.10 Vegetation Removal. Vegetation shall not be removed or intentionally damaged beyond the construction corridor. Woody debris, trees, or shrubs greater than 6 inches in diameter within the stream channel or on the lower banks of the stream shall not be removed unless submitted to CDFW during annual project notifications ~~approved by CDFW~~. Within tidal marsh habitat, vegetation removal shall be limited to the minimum amount necessary to avoid the loss of salt marsh harvest mice from any work activities in suitable habitat. Sufficient pickleweed habitat shall remain adjacent to the activity area to provide refugia for displaced harvest mice. Exclusion fencing shall be erected adjacent to work areas as described in Section 2.79.

2.11 Vegetation Removal Methods. Hand tools (e.g., trimmer, chain saw, etc.) shall be used to trim vegetation to the extent necessary to gain access to the work sites. No bulldozers, backhoes, or other heavy equipment shall be used to remove vegetation along streambanks or within the stream unless submitted to CDFW during annual project notifications ~~without prior written approval from the CDFW~~.

2.12 Limitations on Bank Stabilization/Bank Repair. This Agreement does not authorize bank or channel fill, such as placement of imported soils, riprap, etc. except those projects covered under Section 4. Bank Stabilization.

2.13 Limitations on Vegetation Removal. The disturbance or removal of vegetation shall not exceed the minimum necessary to complete maintenance activities. Precautions shall be taken to avoid other damage to vegetation by people or equipment. Branches and/or limbs overhanging the trails and channel and impacting trail access and water flows shall be properly pruned. Trees may be removed from natural channels if and only if they are below ordinary high water (OHW) and they are restricting the capacity of the channel and they are causing erosion or flooding. Any trees which must be cut are to be cut at ground level and the root mass left in place to maintain bank stability.

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2.14 Removal of Vegetation causing Flow Restrictions. Woody and herbaceous plants, fallen trees, or trunks or limbs lodged in the bed or bank causing flow restriction shall be cut off at the bed or bank invert with small tools and removed with winch and cable or other equipment operated from top of bank. Root structures are not to be disturbed.

2.15 Stumps or Large Woody Debris Restrictions. Embedded pieces of large woody debris or stumps that potentially serve as basking sites or that encourage pool formation shall be left in place if it does not obstruct the flow of water and there is adequate flood flow capacity.

2.16 Embedded Objects. Objects embedded/anchored in the bank, such as tree stumps, shall not be removed during periods of heavy flow if removal would result in release of sediment into the channel. However, protruding objects that could capture additional debris and result in obstruction of the channel (e.g. the branches and trunk of a downed tree) may be trimmed. If an embedded object must be removed to prevent a debris jam, Best Management Practices (BMPs) (see Measure 2.33) shall be used to prevent release of sediment into the channel, and the bank shall be reseeded, re-vegetated, mulched and/or covered with erosion-control fabric following removal.

2.17 Disposal of Invasive Plant Material. Suitable onsite disposal areas shall be identified to prevent the spread of weed seeds. Invasive plant material shall be rendered nonviable when being retained onsite. Staff shall desiccate or decompose plant material until it is nonviable (partially decomposed, very slimy or brittle). Depending on the type of plant, disposed plant material can be left out in the open as long as roots are not in contact with moist soil, or can be covered with a tarp to prevent material from blowing or washing away. District staff shall monitor all sites where invasive plant material is disposed onsite and treat any newly emerged invasive plants. ~~Invasive plant material removed during work activities shall be bagged and appropriately incinerated or disposed of in a landfill or permitted composting facility.~~

2.18 Snags. To the maximum amount practicable, individual dead or dying trees shall be retained, with modification if appropriate, as snags. This measure should not be considered to apply in areas where removal is warranted to control spread of a disease or for human safety purposes.

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2.19 Stream Diversion Approval. Permittee shall make every effort to carry out routine maintenance activities when the creek is dry except in perennial streams or during wet weather years in which the channel does not dry. In these instances, work will be scheduled during periods of low flow and must adhere to the dewatering provisions in Exhibit B and the associated Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work. When working within wet channels, there will be a designated water quality monitor to monitor and document turbidity entering and exiting the work site. ~~If this is not possible, water diversions shall occur with written approval by CDFW. Requests for diversions and diversion methodology shall be submitted with yearly project proposals.~~

2.20 Stream Diversion Methodology. Stream ~~If stream diversion was approved by CDFW, the~~ diversion systems shall maintain as much instream connectivity as possible to allow for movement of aquatic organisms. Diversion shall be conducted such that water at the downstream end does not scour the channel bed or banks. Coffer dams, if used, shall be constructed upstream and downstream of the work area as close as practicable to the work site. Coffer dams shall be constructed of a non-erodible material which does not contain soil or fine sediment and shall be constructed with clean gravel and bags, and may be sealed with sheet plastic. All materials shall be removed from the stream upon project completion. Normal flows shall be restored to the affected stream immediately upon completion of work at that location. Coffer dams and the stream diversion system shall remain in place and functional throughout the construction period. If, the coffer dams or stream diversion fail, they shall be repaired immediately.

2.21 Water Surface Elevation. During dewatering of the channel, the decrease in water surface elevation (WSE) shall be controlled such that WSE does not change at a rate that increases turbidity to the creek that could be deleterious to aquatic life and the likelihood of stranding aquatic life up- and downstream of the creek. Flows shall be provided to downstream reaches during all times the natural flow would have supported aquatic life. Said flows shall be sufficient quality and quantity, and of appropriate temperature to support fish and other aquatic life both above and below the diversion.

2.22 Check for Stranded Aquatic Life. The biological monitor or qualified biologist shall check daily for stranded aquatic life as the water level in the dewatering area drops. All reasonable efforts shall be made to

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capture and move all stranded aquatic life observed in the dewatered areas. Capture methods may include fish landing nets, dip nets, buckets and by hand. Captured aquatic life shall be released immediately in the closest body of water adjacent to the work site. This measure does not allow for the take or disturbance of any state or federally listed species.

2.23 Nonnative Aquatic Species Removal. Any aquatic nonnative invasive species found shall be disposed of properly and shall not be placed back into the creek where work is being conducted or any other drainages, creeks or streams. Permittee shall send a list to CDFW of species found and the location they were found after completion of project activities.

2.24 Silt Curtains. The Permittee shall deploy silt curtains or other appropriate silt filtering devices, such as straw bales, around the excavation site to prevent heavily silted water from impacting areas around the site. The silt curtain or silt filtering devices shall be maintained throughout all phases of the excavation and construction activities.

2.25 Turbidity Monitoring. During RMA activities in wetted stream channels, Permittee shall monitor turbidity levels up and downstream of the project site before and during project activities and shall keep a log of turbidity data. Maintenance activities shall not result in increases in turbidity of the stream <u>of more than 20 percent of upstream sampling locations</u>, as measured <u>visually or by</u> by Nephelometric turbidity units (NTU) <u>as approved by the Regional Water Quality Control Board Waste Discharge Requirements and Water Quality Certification covering the proposed work</u>.~~, of more than 20 percent of upstream sampling locations.~~

2.26 Cease Project for Elevation of Turbidity Levels. Upon CDFW or Permittee's determination that turbidity/siltation levels resulting from project related activities constitute a threat to aquatic life, activities associated with the turbidity/siltation shall be halted until effective CDFW approved control devices are installed or abatement procedures are initiated. The CDFW may take enforcement action if appropriate turbidity and siltation control measures are not deployed.

2.27 Spoils. Spoils shall not be placed where it could enter the stream, riparian or wetland areas. Spoil shall not be placed over riparian or wetland vegetation except as specifically noticed to and accepted by CDFW.

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2.28 Staging Areas. Staging areas shall be located at least 30 feet from the top of bank or on the outboard side of levees. Vegetation disturbance shall be limited to the immediate construction footprint and a single access pathway, where feasible.

2.29 Check for Wildlife in Pipes/Construction Materials. Permittee shall visually check all construction materials (bridges, pipes, culverts) for the presence of wildlife sheltering within them prior to the materials being moved and placed in their proper locations.

2.30 Escape Ramp in Trench. If there are open trenches or pits, at the end of each work day, Permittee shall place an escape ramp at each end of the open trench to allow any animals that may have become entrapped in the trench to climb out overnight. The ramp may be constructed of either dirt fill or wood planking or other suitable material that is placed at an angle no greater than 30 degrees.

2.31 Removal of Trash and Debris. Except as explicitly described in this Agreement, the removal of native soils, rock, gravel, vegetation, and vegetative debris from the stream bed or stream banks is prohibited.

Permittee shall remove all raw construction materials and wastes from work sites following the completion of maintenance activities. Food-contaminated wastes generated during work shall be removed on a daily basis to avoid attracting predators to work sites. All temporary fences, barriers, and/or flagging shall be completely removed from work sites and properly disposed of upon completion of maintenance activities. Permittee or its contractors shall not dump any litter or construction debris within the riparian/stream zone.

2.32 Erosion Control Best Management Practices (BMPs). All exposed soils within the work area shall be stabilized immediately following the completion of earthmoving activities to prevent erosion into the stream channel. Erosion control BMPs, such as silt fences, straw hay bales, gravel or rock lined ditches, water check bars, wattles, forest duff or mulches, and broadcasted straw shall be used. Erosion control fabrics shall be constructed of biodegradable materials, such as coir or jute, unless otherwise authorized by CDFW. Erosion control BMPs shall be monitored during and after each storm event for effectiveness. Modifications, repairs and improvements to erosion control BMPs shall be made as needed to protect water quality. At no time shall silt laden runoff be allowed to enter the stream or directed to where it may enter the stream.

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2.33 Erosion Control Methods. Disturbed areas shall be re-vegetated according to the District's BMPs for Revegetation. ~~with propagules (seeds, cuttings, divisions) of locally collected native plants.~~ If locally collected native plants are not available, sterile or short-lived re-vegetation plants shall be used (e.g. cereal barley, Regreen, Trios). Disturbed areas shall be protected with correctly installed erosion control measures (e.g. jute, certified weed free straw, coconut fiber, or coir logs). Materials containing monofilament or plastic shall not be used.

2.34 Erosion Control Measures. Erosion control measures shall be utilized throughout all phases of operation where sediment runoff from exposed slopes threatens to enter Waters of the State. This may require the construction at the toe of the slope below the construction site, of silt catch basins, silt fencing, certified weed free straw bale dikes, or other siltation barriers. At no time shall silt laden runoff be allowed to enter the stream or directed to where it may enter the stream.

2.35 Tidally Influenced Area. Work within any tidally influenced area shall be completed at low tide periods only. All equipment shall be out of the channel prior to the incoming tide.

2.36 Stop Work Authority. The biological monitors or qualified biologist shall have the responsibility and authority of stopping the proposed project if any crews or personnel are not complying with the provisions outlined in this Agreement.

2.37 Construction Equipment Cleanup. Construction equipment shall arrive at the maintenance activity sites clean and free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species. Invasive weed species occurring within locations of construction clearing and grubbing shall be flagged for removal by the biological monitor or qualified biologist. These species, along with associated duff and topsoil, as appropriate, shall be disposed of by the contractor. These materials shall not be allowed to be integrated with other onsite topsoil materials intended for salvage and replacement.

2.38 Staging and Storage Areas. Building materials and/or construction equipment shall not be stockpiled or stored where they could be washed into the water or where they will cover aquatic or riparian vegetation.

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2.39 Equipment over Drip-pans. Staging and storage areas for equipment, materials, fuels, lubricants and solvents shall be located away from the wetted areas. Stationary equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the creek shall be positioned over drip-pans.

2.40 Maintenance of Vehicles. Any equipment or vehicles driven and/or operated adjacent to the creek areas shall be checked and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life, wildlife or riparian habitat. Vehicles must be moved away from the stream prior to refueling and lubrication.

2.41 Hazardous Materials. Any hazardous or toxic materials that could be deleterious to aquatic life that could be washed into State waters or its tributaries shall be contained in water tight containers or removed from the project site.

2.42 Debris and Waste Disposal. The contractor shall not dump any litter or construction debris within the project area. All such debris and waste shall be picked up daily and properly disposed of at an appropriate site.

2.43 Change of Conditions. If, in the opinion of CDFW, conditions arise, or change, in such a manner as to be considered deleterious to the stream or wildlife, operations shall cease until corrective measures approved by CDFW are taken.

Species Avoidance Measures

Salmonids

2.44 Coho Streams. No routine maintenance activity requiring dewatering shall be permitted under this Agreement in creeks where known occurrences of coho salmon exist. Permittee shall notify the CDFW for a separate Agreement pursuant to FGC Section 1602 for those activities.

2.45 Steelhead. Permittee shall comply with Avoidance and Minimization measures 2.1 through 2.44 in order to avoid and minimize impacts to steelhead and steelhead habitat.

Raptors and Birds

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2.46 Nesting Bird Survey. If Project activities are scheduled during the nesting season of raptors and migratory birds, a focused survey for active nests of such birds shall be conducted by the qualified biologist within 15 days prior to the beginning of project-related activities. (Note: Additional requirements specific to marbled murrelet are specified under Measure 2.90.) Surveys shall be conducted in all suitable habitat located at Project work sites and in staging and storage areas. The minimum survey radii surrounding the work area shall be the following: i) 250 feet for passerines; ii) 500 feet for other small raptors such as accipiters; iii) 1,000 feet for larger raptors such as buteos. The bird survey methodology and the results of the survey shall be submitted to the CDFW prior to commencement of Project activities.

Nesting seasons shall be defined as followed: i) March 15 to August 30 for smaller bird species such as passerines; ii) February 15 to August 30 for raptors.

2.47 Active Nests. An active nest is defined as a nest having eggs or chicks present, or a nest that adult birds have staked a territory and are displaying, constructing a nest, or are repairing an old nest. If active nests are found <u>and work cannot be postponed</u>, the Permittee <u>shall utilize the buffers and methods identified in Measure 2.48 and notify</u> ~~consult with~~ the CDFW and the USFWS regarding appropriate action to comply with the Migratory Bird Treaty Act of 1918 and the FGC. If a lapse in project-related work of 15 days or longer occurs, another focused survey shall be conducted before project work is reinitiated. If active nests are found, the Permittee shall consult with the CDFW and the USFWS prior to resumption of project activities.

2.48 Active Nest Buffers. Active nest sites shall be designated as "Ecologically Sensitive Areas" and protected (while occupied) during project activities with the establishment of <u>flagging or</u> a fence barrier surrounding the nest site. The minimum distances of the protective buffers surrounding each identified nest site shall be the following: i) 500 feet for large raptors such as buteos; ii) 250 feet for small raptors such as accipiters; iii) 250 feet for passerines. A biological monitor or qualified biologist shall monitor the behavior of the birds (adults and young, when present) at the nest site to ensure that they are not disturbed by project-related activities. Nest monitoring shall continue during project-related construction work until the young have fully fledged, are no longer being fed by the parents and have left the nest site, as determined by a biological monitor.

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2.49 Nesting Habitat Removal or Modification. No trees or shrubs shall be disturbed that contain active bird nests until all eggs have hatched, and young have fully fledged (are no longer being fed by the adults, and have completely left the nest site). To avoid potential impacts to tree or shrub-nesting birds, any trimming or pruning of trees or shrubs shall be conducted during the time period of September 16 to February 14 unless a preconstruction nesting bird survey has been conducted by a qualified biologist. No habitat removal or modification shall occur within the Ecologically Sensitive Area fenced nest zone even if the nest continues to be active beyond the typical nesting season for the species (refer to Measure 2.47), until the young have fully fledged and will no longer be adversely affected by the project.

California red-legged frog (CRLF)

In Jurisdictional areas within 1 mile of a known occurrence of CRLF:

2.50 CRLF Survey. Prior to and within 48 hours of the planned start of project activities, a focused survey for CRLF using agency approved protocol shall be conducted by a qualified biologist to determine if they are in the area. If CRLF are found, ~~the CDFW shall be notified immediately to determine the correct course of action and routine~~ maintenance activities shall not commence until after May 30~~ and not begin until approved by the CDFW~~. CDFW reserves the right to provide additional measures to this Agreement to protect sensitive species.

2.51 Monitors On-Site for CRLF. If CRLF are found, biological monitor(s) and/or qualified biologists shall be on the project site while routine maintenance activities are being conducted at these sites.

2.52 Vegetation Removal by Mechanized Equipment at CRLF Sensitive Sites. For vegetation removal on berms or other sites with known CRLF observances, vegetation shall be cut down to 3 inches by handtools (weedwhacker, etc). Once the ground is visible, a visual survey for CRLF shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a CRLF is observed, all activities shall cease and CDFW shall be notified immediately. CRLF can be relocated only if a person is permitted by the USFWS and approved by CDFW for this specific project to handle CRLF.

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2.53 Vehicle Restrictions. If CRLF are found, any vehicle parked on site for more than 15 minutes shall be inspected by the biological monitor or qualified biologist before it is moved to ensure that CRLF have not moved under the vehicle. Any parking areas must be checked in advance by the biological monitor or qualified biologist.

2.54 No Stockpiling of Vegetation. If CRLF are found, vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on site for erosion control or slash and not be moved or disturbed.

2.55 No Stockpiling of Soil. Soil shall not be stockpiled on the ground unless it is on a paved surface or staging area where there aren't burrows.

2.56 CRLF Exclusion for Sediment Removal with Large Equipment. If CRLF are found in routine maintenance activity sites using large equipment to remove sediment, CRLF shall be excluded from the project site. CDFW-approved exclusion fencing shall be installed around the sediment removal site, staging areas and any areas where fill may be dumped. After installation of the fence barrier, a biological monitor or qualified biologist shall daily inspect the project work area, staging and stockpiling area prior to the commencement of activities. If the biological monitor or qualified biologist determines that sensitive species are not within the work area, equipment or materials may be moved onto the work site and project activities may commence under the observation of the biological monitor.

CRLF in Ponds

2.57 CRLF Survey in Ponds. Prior to and within 48 hours of the planned start of project activities, a focused survey for CRLF using agency approved protocol shall be conducted by a qualified biologist to determine if they are in the area. If CRLF are found, the CDFW shall be notified immediately to determine the correct course of action and routine maintenance activities shall not commence until after May 30 and not begin until approved by the CDFW. CDFW reserves the right to provide additional measures to this Agreement to protect sensitive species. CDFW may request Permittee to notify the CDFW for a separate Agreement pursuant to FGC Section 1602 for this activity.

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2.58 Seasonal Work Period in Ponds. If CRLF are found in the pond and water is present in the pond, sediment removal and berm or outfall repair activities shall be performed from August 15 to November 1. Dredging and de-watering operations shall be submitted to ~~approved by~~ CDFW prior to commencement of activities.

2.59 Vegetation Removal at Ponds. If CRLF are found, tule and emergent vegetation shall be removed by hand when feasible. If mechanized equipment is used, one or more ~~a two~~ biological monitors or qualified biologists shall be onsite monitoring the scoop bucket while scooping and watching each load unload. CDFW shall be notified during the annual project notification process when mechanized equipment will be used for vegetation removal at ponds.

2.60 Inspection for Egg Masses. In work areas containing emergent vegetation (e.g., tules, cattails), vegetation shall be inspected for CRLF eggs masses prior to work. If work cannot be postponed, a ~~A~~ buffer of vegetation at least 10 feet in diameter shall be left around any egg masses found. Permittee shall keep a record of any sites where egg masses are found and shall conduct vegetation removal at these sites prior to November 1 in subsequent years.

2.61 Egg Mass Avoidance. Staff shall avoid entering the channel to avoid dislodging egg masses. Trimming activities shall be performed from the banks, if possible.

General CRLF

2.62 Cease Activities for CRLF. If CRLF enters the work area, all work shall stop until the animal leaves on its own. If a person is permitted by the USFWS and approved by CDFW for this specific project to handle CRLF, only they can handle and relocate CRLF. Permittee shall contact notify CDFW of the ~~to develop~~ site appropriate avoidance measures utilized for relocation, which will become part of this Agreement. CDFW may request Permittee to notify the CDFW for a separate Agreement pursuant to FGC Section 1602.

2.63 Stop Work Authority for CRLF. The biological monitor and/or qualified biologist shall have the authority to halt work activities that may affect CRLF adults, tadpoles or egg masses until they can be moved out of harms way.

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2.64 CRLF and SFGS Sightings. Any project-related, human cause injuries ~~sightings and/or injuries~~ to CRLF or SFGS shall be immediately reported to the CDFW.

If CRLF are not found:

2.65 Monitors On Site. The biological monitor shall remain onsite if sensitive areas are identified during the presurvey. A biological awareness training shall be provided to all persons prior to beginning work. If at any time a CRLF is observed, work shall stop immediately until a biological monitor is contacted. Biological monitor(s) and/or qualified biologists shall then remain ~~be~~ on the project site while routine maintenance activities are being conducted. General CRLF Measures 2.59 through 2.62 shall be followed.

In jurisdictional areas having suitable habitat where CRLF have not yet been documented:

2.66 Cease Activities for CRLF. If CRLF enters the work area, all work shall stop until the animal leaves on its own. Permittee shall contact CDFW to develop site appropriate avoidance measures which will become part of this Agreement. CDFW may request Permittee to notify the CDFW for a separate Agreement pursuant to FGC Section 1602 for this activity.

Yellow-legged Frog (YLF)

2.67 Cease Activities for YLF. If YLF enters the work area, all work shall stop until the animal leaves on its own. Permittee shall contact CDFW to develop site appropriate avoidance measures which will become part of this Agreement.

San Francisco garter snake (SFGS)

In jurisdictional areas within 1 mile of a known occurrence of SFGS:

2.68 ~~No~~ Routine Maintenance Activities Consistent with State and Federal Permits. Maintenance activities permitted under the terms and conditions of the USFWS Recovery Permit Number: TE225974-2, dated 12/22/16, and CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander" dated April 6, 2017 may proceed following the terms and conditions of these permits.

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~~If there are known occurrences of SFGS either through CNDDB and/or USFWS databases or from known studies, or sightings from Permittee and biologists, routine maintenance activities shall not occur. Permittee shall submit a separate Agreement pursuant to FGC Section 1602 for this activity.~~

In jurisdictional areas having suitable habitat where SFGS has not yet been documented:

2.69 Monitors On-Site for SFGS. A biological awareness training shall be provided by a qualified biologist to all persons prior to beginning work. A biological monitor shall remain onsite in sensitive areas identified during the pre-survey. If at any time a SFGS is observed, work shall stop immediately until a biological monitor is contacted. Biological monitor(s) and/or qualified biologist(s) shall remain on the project site while routine maintenance activities are being conducted. Biological monitor(s) and/or qualified biologists shall be on the project site while routine maintenance activities are being conducted at these sites.

2.70 Vegetation Removal by Mechanized Equipment. For vegetation removal on berms or other sites with SFGS habitat, vegetation shall be cut down to 3 inches by handtools (weedwhacker, etc). Once the ground is visible, a visual survey for SFGS shall be conducted. If no sensitive species are found in the area, removal of vegetation may continue by mowing or mechanized equipment very slowly with a biological monitor walking in front of the equipment to observe. If a SFGS is observed, all activities shall cease and CDFW shall be notified immediately.

2.71 No Stockpiling of Vegetation. Vegetation removed shall be placed directly into a disposal vehicle and removed from the site. Vegetation shall not be piled on the ground unless it is later transferred, piece by piece, under the direct supervision of the biological monitor or qualified biologist or is going to remain on site for erosion control or slash and not be moved or disturbed.

Western Pond Turtle (WPT)

In jurisdiction areas within one mile of known WPT occurrences:

2.72 WPT Survey. Prior to and within 48 hours of the planned start of routine maintenance activities, a focused survey for WPT and WPT nests shall be conducted by a qualified biologist to determine if they

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are in the area. If WPT are found, Measure 2.73 shall be implemented and the CDFW shall be notified ~~immediately to determine the correct course of action and activities shall not begin until approved by the CDFW~~.

2.73 WPT Avoidance. In the event WPT are found in the project area, the Permittee shall exercise measures to avoid direct injury to them as well as avoid areas where they are observed to occur. If a WPT is observed, it shall be left alone to move out of the area on its own. If it does not move on its own, it can be relocated to a safe ~~at least a 100 m~~ distance away from the project location. Relocation areas shall be of suitable habitat, on shallow banks with slow moving water and shall be far enough away so as not to be affected by project activities. If a WPT nest is found, all activities shall cease and Permittee shall contact CDFW to develop site appropriate avoidance and minimization measures.

San Francisco dusky-footed woodrat (SFDW)

2.74 SFDW Protection ~~Preconstruction Survey~~. All routine maintenance work in the proximity of SFDW and/or their nests shall adhere to the BMPs in Exhibit B. ~~A preconstruction survey for SFDW by a qualified biologist shall be conducted within two weeks prior to routine maintenance activities. If SFDW nests are present, the nests shall be flagged and construction fencing that will not impede the movement of the SFDW shall be placed, around the nest to create a 20-foot buffer from the construction area. If the nest is located adjacent to a road or trail, the nest shall be clearly flagged so equipment/truck drivers accessing sites can see the nest. A biological monitor or qualified biologist shall monitor the nest during project activities.~~

2.75 ~~Protection of SFDW. In the event a SFDW nest is found in the Project area, the Permittee shall submit the results of surveys in the immediate work area, in any areas expected to be disturbed by project activities and in a 50-foot buffer around those areas. The locations of any detected nests, sighted individuals or carcasses shall be plotted on a base map or maps. The base map or maps shall consist of an aerial photograph of the work site, predicted disturbed areas and the 50-foot buffer, each of which will be identified on the map or maps. The map or maps will be of such scale as to allow identification of individual nest sites or nest clusters. Once this map is completed, the map shall be submitted to the~~

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~~CDFW who will confer with the Permittee regarding the development of suitable protective and mitigation measures. Upon determination of those measures, the CDFW shall submit written avoidance and mitigation measures to the Permittee and those measures will be considered part of this Agreement.~~

Salt Marsh Harvest Mouse (SMHM), Salt Marsh Wandering Shrew (SMWS), Ridgeway's Rail (RIRA), ~~and California Clapper (CCR)~~ and California Black Rails (CBR)

In jurisdictional areas in tidal habitats and within 300 feet of pickleweed habitat:

2.75 Biological Awareness Training. For all work activities within or adjacent to tidal marsh or slough habitat, a biological awareness training shall be provided by a qualified biologist to all persons prior to beginning work. Work crews shall be informed of the following:

- A description and status of the species potentially present on the work site
- The importance of their associated habitats
- Their sensitivity to human activities
- The legal protections afforded to each species and penalties for violating them
- The roles and authority of the monitoring biologist(s)

A biological monitor shall remain onsite in sensitive areas identified during the presurvey. If at any time SMHM or RIRA is observed, work shall stop immediately until a biological monitor is onsite.

A fact sheet conveying this information shall be prepared for distribution to the crew and anyone else who enters the project site. A District representative shall be appointed who will be the contact source for any employee or contractor who might encounter a listed species. The representative(s) shall be identified during the environmental education program.

2.76 Seasonal Work Period. Work within or adjacent to ~~in~~ the tidal slough and marsh habitat shall be confined to the period September 1 to October 31 to avoid potential impacts to ~~CCR and~~ RIRA, CBR and SMWS (breeding season spans February 1 to August 31). If maintenance activities cannot be conducted during this seasonal work period, Permittee shall notify CDFW during annual notification. CDFW may either allow work to be conducted with Permittee

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complying with the following measures, or CDFW may require Permittee to submit a notification for a separate agreement.

Work during the SMHM breeding season (March 1 to November 1) of each year shall be conducted only under the supervision of a qualified onsite biologist and under conditions stated in Measures 2.77 to 2.85.

If breeding rails are determined to be present in the work area, activities will not occur within 700 feet of an identified calling center. If the intervening distance between the rail calling center and an activity area is across a major slough channel (subject to typical boating activities and/or traffic) or other substantial audiovisual barrier and the distance is greater than 200 feet, then work may proceed at that location within the breeding season.

2.77 Work during Low Tide. Any work within the tidally influenced area shall be restricted low tide periods only. All equipment must be out of the channel prior to incoming tide.

2.78 No Work around Extreme High Tide Periods. Permittee shall not conduct routine maintenance activities within or adjacent to clapper rail habitat within two hours before or after extreme high tides (6.5' or above, as measured at the Golden Gate Bridge) when the marsh plain is inundated.

2.79 SMHM Exclusion Fencing. To prevent SMHM from moving through the project site during activities, temporary exclusion fencing shall be placed around a defined work area before excavation activities begin. The fence shall be made of non-woven material that does not allow SMHM to pass through or over, and the bottom should be buried to a depth of 2 inches so that SMHM cannot crawl under the fence. Fence stakes shall face towards the work site, away from the habitat. The biological monitor shall have the ability to make field adjustments to the location of the fencing depending on site-specific habitat conditions.

2.80 CDFW Approval of Fencing. The final design and proposed location of the fencing shall be reviewed and approved by CDFW prior to placement

2.81 Sensitive Species Inspection. Prior to the initiation of work each day during the construction of the exclusion fencing and all work within 300 feet of tidal or pickleweed habitats, the biological monitor shall

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thoroughly inspect the work area and adjacent habitat areas to determine if SMHM, SMWS, CBR or RIRA~~CCR~~ are present. The biologist shall ensure the exclusion fencing has no holes or rips and the base remains buried. The fenced area will be inspected daily to ensure that no mice are trapped. Any species found along or outside the fence will be closely monitored until they move away from the construction area. The biological monitor shall remain on-site throughout these days while maintenance activities are occurring.

A qualified biologist shall perform a habitat assessment survey for SMHM and SMWS two days before work activity begins, and for RIRA and CBR 90 days before work activity begins, to determine if suitable nesting habitat for each species is present within 100-500 feet of work areas and to look for individuals and/or nests.

If suitable breeding mice or rail habitat or individuals are found within 100 feet of the work area, CDFW shall be consulted regarding the implementation of protective measures such as delaying work until individuals have moved out of the area.

If suitable breeding rail habitat or individuals are found within 100 feet of the work area, biologists shall complete surveys to determine presence-absence of rail species onsite within 15 days of work. Pre-work surveys are not required if work will be conducted outside of the breeding season, or if no rail species are present onsite. If rails are present, "no work" buffer zones shall be established around active nests, which shall be clearly marked in the field and on geotechnical drawings, and shall be monitored and maintained for the duration of work.

2.82 Stop Work for Sensitive Species. If a mouse of any species, a ~~CCR~~ SMWS, RIRA, or CBR is observed within the work area, then work shall be stopped immediately by the biological monitor, and the individual ~~mouse or rail~~ shall be allowed to leave the work area on its own volition. CDFW shall be notified of any such occurrences. If the individual ~~mouse or rail~~ does not leave the area, then no work shall commence until CDFW has made a determination on how to proceed with work activities. In suitable habitats for SMHM, SMWS, RIRA, and CBR, a biological monitor shall remain onsite to inspect work areas, walk in front of vehicles and equipment when accessing the site, and check underneath equipment before moving.

2.83 ~~Rail~~ Nests. If any rail, SMHM or SMWS nests are observed within the work or within 500 feet of the work area, work shall be stopped

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and CDFW shall be contacted. No work shall commence until CDFW has made a determination on how to proceed with work activities.

2.84 Access Routes. Access, excavation and haul equipment shall be confined to developed access routes (established trails/roads) outside of marsh vegetation. No marsh vegetation shall be removed to gain access to a project site or for staging areas. If it is deemed necessary to remove marsh vegetation, Permittee shall submit a Notification to CDFW for a separate Agreement pursuant to FGC Section 1602 for this activity.

2.85 Designation of Work Area. Prior to maintenance activities, a biological monitor shall clearly mark/flag or erect temporary construction fencing to designate the work area and to delineate the areas that shall be avoided. All saltmarsh vegetation shall be avoided. Flagging and or temporary construction fencing shall be removed immediately after the completion of maintenance activities.

Mount Hamilton Fountain Thistle (MHFT), Western leatherwood (WL), Loma Prieta Hoita (LPH), ~~and~~ Popcorn Flower complex, and Congdon's tarplant (CT)

In jurisdictional areas having suitable habitat characteristics and within ¼ mile of known occurrence:

2.86 Special Status Plant Survey. Prior to the start of project activities, a qualified biologist shall conduct protocol level surveys for sensitive plant species during the peak blooming period. For information on special status plant survey methodology visit: http://www.wildlife.ca.gov/biogeodata/cnddb/pdfs/Protocols_for_Surveying_and_Evaluating_Impacts.pdf

2.87 Rare Plant Exclusion. If at any time MHFT, LW, LPH, popcorn flowers, CT or other rare plant species is found, it shall be flagged for avoidance and site specific avoidance buffers approved by CDFW shall be implemented. All the rare plants and associated buffer zones shall be avoided during maintenance activities.

2.88 Rare Plant Avoidance. If at any time, MHFT, LW, LPH, CT, and popcorn flowers cannot be avoided, routine maintenance activities shall not be conducted under this Agreement. Permittee shall submit a Notification to CDFW for a separate Agreement pursuant to FGC Section 1602 for this activity.

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In jurisdictional areas having suitable habitat characteristics and no known occurrences of rare plants:

2.89 Rare Plant Protection Measures. Permittee shall comply with Measures 2.86 through 2.88.

Marbled Murrelet (MAMU)

In areas within the range of MAMU habitat as identified in the District 2007 maps, Permittee shall conduct a survey of habitats within ¼-mile of the project area for trees that meet the Pacific Seabird Group definition of potential MAMU nesting trees. If such trees are present within 300 feet of the project area or if a MAMU nest is detected, Permittee shall consult with CDFW before proceeding. If habitat trees are present within ¼-mile of the project site but are greater than 300 feet from the work area, Permittee may proceed with the following conditions:"
:

2.90 Seasonal Work Period. Work within the project area shall be confined to the period of September 15 to November 1. If maintenance activities cannot be conducted during this seasonal work period, Permittee shall notify CDFW during the Feb. 1 notification. CDFW may either allow work to be conducted with Permittee complying with the following Measures 2.90.1 through 2.90.9 or CDFW may require Permittee to submit a Notification to CDFW for a separate Agreement pursuant to FGC Section 1602 for this activity.

2.90.1 Marbled Murrelet Buffers. If construction activities occur during the marbled murrelet breeding season (March 24 to September 15), seasonal disturbance minimization buffers as listed in the table below and in the July 26, 2006 document, *Estimation of the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California* (Exhibit 1), shall be followed:

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Table 1. Estimated harassment distance in feet due to elevated action-generated sound levels for proposed actions affecting the marbled murrelet, by sound level.

	Anticipated Action Generated Sound Level (dB)			
Existing Pre-Project (Ambient) Sound Level (dB)	Moderate (71-80)	High (81-90)	Very High (91-100)	Extreme (101-110)
Natural Ambient (<=50)	165	500	1320	1320
Very Low (51-60)	0	330	825	1320
Low (61-70)	0	165	825	1320
Moderate (71-80)	0	165	330	1320
High (81-90)	0	165	165	500

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2.90.2 Marbled Murrelet Sound Study. Permittee shall conduct a sound level monitoring study to determine level of ambient and construction activity noise anticipated during construction activities to calculate seasonal disturbance minimization buffer widths. Description of methods and results of study shall be submitted to CDFW for approval 30 days prior to commencement of activities.

2.90.3 Marbled Murrelet Seasonal Buffers. In order to alert work crews to their presence, marbled murrelet seasonal disturbance buffers, as determined by the sound study and Table 1 above, shall be flagged in the field where they enter the project area.

2.90.4 Marbled Murrelet Nest Tree Protection. If Permittee chooses not to conduct the sound study, no maintenance activities shall occur within 0.25-mile of potential nest trees during the

marbled murrelet breeding season (March 24 to September 15).

2.90.5 Marbled Murrelet Sunrise/Sunset. If noise generating construction activity takes place during the breeding season (March 24 to September 15) within Redwood and Redwood/Douglas-fir forests, construction activities shall be restricted to 2.0 hours after sunrise to 2.0 hours before sunset to minimize disturbance of potential nesting murrelets using forest habitat as a travel corridor between inland nesting and coastal habitat.

2.90.6 Murrelet Line-of-Sight. Permittee shall not conduct project activities within a visual line-of-sight distance of 40 m or less from a suitable nest tree as designated by a qualified biologist.

2.90.7 Marbled Murrelet Protocol Survey. If marbled murrelet protocol level surveys are conducted and do not indicate that the habitat is occupied by marbled murrelet, the seasonal and distance work restriction as stated above in 2.90.1. and 2.90.4 may be lifted with written approval from CDFW. Protocol level survey procedures and information can be found at: http://www.pacificseabirdgroup.org/publications/PSG_TechPub2_MAMU_ISP.pdf

2.90.8 Murrelet Surveys. If Permittee chooses to conduct marbled murrelet protocol level surveys, CDFW shall be notified and shall approve the survey stations to ensure all contiguous suitable habitat is covered and good visuals of the sky and nearby flyways, if present, are provided.

2.90.9 Marbled Murrelet Surveys Report. If marbled murrelet protocol level surveys are conducted, Permittee shall submit the report as stated in Appendix G in *Methods for Surveying Marbled Murrelets in Forests: A Revised Protocol for Land Management and Research*, which can be accessed at the link in Measure 2.91.7.

<u>Santa Cruz Black Salamander (Aneides flavipunctatus niger) (SCBS) and California Giant Salamander (Dicamptodon ensatus)(CGS)</u>

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2.91 SCBS and CGS Avoidance. In areas of suitable habitat where SCBS and/or CGS occur:

- A biological awareness training provided by a qualified biologist is required prior to starting work.
- A qualified biologist and biological monitor shall be available on-call for the duration of the project.
- A biological monitor is required when working within or immediately adjacent to wetted areas including stream channels, seeps, and springs.
- For SCBS only, a biological monitor is also required in areas of talus slopes or areas having human stacked rocks and other suitable materials acting as talus.
- The biologist and/or biological monitor has the authority to stop work at any time.
- Dismantling of talus and human-stacked rocks and other suitable materials acting as artificial talus shall be avoided and minimized whenever possible. If removal is required to meet project objectives, these materials shall be dismantled by hand whenever possible.
- Whenever possible individual SCBS and CGS shall be allowed to leave the area on their own.
- Individual SCBS or CGS (not with eggs) that are in harm's way or do not leave the work site on their own may be relocated by a qualified biologist or biological monitor to predetermined sites located outside of the work area but within the same subwatershed.
- Work in wetted areas, talus slopes, or human stacked rocks or other suitable materials acting as artificial talus should be completed prior to July to avoid displacement of SCBS females laying eggs and attending to clutches.
- If heavy equipment is required to remove talus, human stacked rocks or other suitable materials acting as artificial talus, if shall be done in the presence of a qualified biological monitor.
- If at any time, SCBS or CGS eggs are found, the area shall be flagged for avoidance. In the area cannot be avoided to meet project objectives, consultation with CDFW shall occur to determine the best course of action.

In all other areas having suitable habitat:

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- A pre-survey of the worksite is required prior to starting work. If no SCBS or CGS are observed, work may proceed.
- In individual SCBS or CGS are observed at any time, all work shall stop and the biologist and/or biological monitor shall be notified and the above measures shall be implemented.

Special Status Bat Species

2.92 Special Status Bat Avoidance. In areas of suitable habitat, preconstruction surveys are required for the following bat species:

- Pallid bat
- Townsend's big-eared bat
- Western red bat

Bat surveys and avoidance measures shall adhere to the District's BMPs (Exhibit B) for avoiding impacts to bat species.

3. Compensatory Measures

To compensate for adverse impacts to fish and wildlife resources identified above that cannot be avoided or minimized, Permittee shall implement each measure listed below.

3.1 Restoration Area. Restoration shall take place in the same Preserve Unit preferably on the same waterway or watershed and adhere to the Revegetation Best Management Practices in Exhibit B.

3.2 Tree Replacement. In suitable areas, t~~T~~rees shall be replaced at the following ratios (replacement trees to removed trees) to mitigate for permanent net loss of habitat and canopy cover:

- For non-native trees that provide canopy cover to the creek: 1:1 ratio
- For native trees: 2:1 ratio unless approved otherwise by CDFW. In certain areas where regeneration will occur or overcrowding is an issue, a 1:1 ratio is acceptable ~~may be approved~~.

3.3 Re-vegetation Ratio. In suitable areas, o~~O~~ther vegetation shall be replaced with the following ratios: wetlands, 1:1; general riparian vegetation, 3:1; sycamore alluvial woodland or other rare habitat types: 5:1; other general habitat types, 1:1.

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3.4 Native Species for Re-vegetation. Replacement trees and vegetation shall be local native species adapted to the lighting, soil and hydrological conditions at the replanting site, except in cases where non-native trees are considered culturally significant. In these areas, non-native trees may be replaced with the same species of non-native tree to preserve the cultural landscape in ongoing maintenance to prevent the spread of the non-native is provided. If replanting within the work area is infeasible due to lack of space, slope steepness or other physical constraints, replacement trees and vegetation may be planted at an alternate location along the stream corridor. Vegetation shall be replaced by December 31 of the year impacts occur in a location that is not subject to future maintenance or construction work.

3.5 Re-vegetation Plan. Where active restoration is warranted, Permittee shall submit a re-vegetation plan with the annual February notification. The plan shall describe the project site and vegetative community, including the conditions warranting active re-vegetation. Proposed restoration measures shall be described, including location, number, size and type of replacement plantings, installation specifications and irrigation specifications if warranted.

3.6 Re-vegetation Survivorship. Any re-vegetation plan shall be accompanied by success criteria specific to the circumstance. The overall intent of the re-vegetation will be to replace or improve on the habitat value of the impacted area in a reasonable amount of time. The term 'Reasonable amount of time' means a return to the pre-project baseline in approximately the same period of time that the pre-existing habitat took to establish naturally. For habitats where this is not feasible (such as oak woodland), success criteria should focus on attributes that will provide a reasonable assurance that the re-vegetation will eventually result in the required replacement value. These attributes could include plant vigor, establishment of minimal species diversity, cover, lack of limiting factors and others.

3.7 Re-vegetation Success Criteria. For every project where habitat is removed, whether active re-vegetation is removed or not, the annual February notification should provide an estimate of the time necessary to re-establish the baseline habitat value lost. Permittee shall monitor the site for that period (as modified by CDFW where warranted). If the site reaches the pre-project habitat baseline prior to the end of the projected monitoring period and keeps that habitat value for two consecutive years, Permittee can request CDFW to waive further monitoring. For sites requiring longer terms to

reasonably reach a pre-project baseline and which are clearly doing well and therefore can reasonably be considered likely to reach the site habitat goals (such as oak woodland or redwood forest), Permittee can request CDFW to consider reducing or ending the monitoring after five years.

3.8 Re-vegetation Remediation. If re-vegetation success criteria requirements do not meet established goals, Permittee is responsible for replacement planting, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these requirements. All plants that die within the monitoring period shall be replaced during the fall the year the plant was determined to have failed. Replacement plants shall be monitored with the same goal as initial planting until habitat goals are met. If the problem(s) is/are larger in scope, are likely to recur and cannot be corrected, Permittee shall consult with CDFW to develop a modified plan for the site.

3.9 Sedimentation. Primary sedimentation control will be provided by implementation of the best management practices in Exhibit B and following the General Measures in Sections M1-M3 of this RMA. For any project where erosion and sedimentation cannot be completely controlled by these measures (such as clearing a plugged culvert in a live channel), additional measures shall be required. Permittee shall identify any projects where this condition occurred during the preceding calendar year and estimate the amount of sediment that bypassed protective measures. To compensate, as part of the annual February notification, Permittee shall propose sufficient erosion control projects to halt chronic sedimentation from other sources of a similar or greater amount. CDFW shall notify Permittee as to whether the project is acceptable. If both parties agree, the project shall be implemented as described. The base project fee will apply if the project is jurisdictional.

4. Reporting Measures

Permittee shall meet each reporting requirement described below.

4.1 Notification of Proposed Activities. Permittee shall provide CDFW written notification of proposed routine maintenance activities to be performed in the upcoming year by February 1 each year. Notification reports shall describe the project location, general topography, hydrological features, vegetative cover within 50 feet of

the work area, length and width of impact area, and a detailed description of proposed modifications to the banks, trails and/or channel. Each description shall include the specific Preserve map showing the work area, a brief description of the types and quality of habitats in the work area, an evaluation of possible resources present and identification of which programmatic conditions will be applied to the project. Photos of the work site will be provided, if the project involves a relocation, both sites should be included. Additional work may be submitted upon discovery using the conditions above. Reports shall be submitted to CDFW regardless of whether work is proposed.

CDFW shall append annual notification reports of proposed maintenance activities to this Agreement. For streamlined tracking, Permittee shall label annual notification reports according to the following convention: Exhibit D-[year] (e.g. Exhibit D-2013, Exhibit D-2014).

4.2 Additional Sites. Permittee may notify CDFW of work at additional sites (in addition to the sites shown in Project Description) if the proposed work fits the definition of routine maintenance, as specified in the Project Description. Work at additional sites may be submitted as described above.

4.3 Annual Reports for Completed Projects. On an annual basis, Permittee shall provide CDFW written notification of maintenance projects completed. Annual reports shall include the project identification (Preserve name, stream name and location), a brief project description, and the appropriate fee from the current CDFW Streambed Alteration Agreement Fee Schedule for work completed under this Agreement based upon the number of projects completed in the reporting period. The annual report is due on December 15 of each year. A report shall be submitted to CDFW regardless of whether work was completed. CDFW may terminate this Agreement if reports and fees are not submitted by this deadline.

4.4 Bird Survey Results. Permittee shall submit to CDFW prior to commencement of Project Activities, the bird survey methodology and results. Refer to Notification Number 1600-2012-0444-R3 when submitting the report to CDFW.

4.5 Biological Surveys. If other surveys (i.e. CRLF, SFDW, rare plants) are conducted for compliance with this Agreement, the survey methods and results of the survey shall be submitted to CDFW prior

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to commencement of work. Refer to Notification Number 1600-2012-0444-R3 when submitting the report to the CDFW.

4.6 Annual Status Report. An annual status report on the re-vegetation mitigation shall be provided to the CDFW by December 31 of each year. This report shall include the survival, percent cover, and height of both tree and shrub species. The number by species of plants replaced, an overview of the re-vegetation effort and the method used to assess these parameters shall also be included. Photos from designated photo stations shall be included. All plants that die within the eight-year monitoring period shall be replaced during the fall the year the plant was determined to have failed. Refer to Notification Number 1600-2012-0444-R3 when submitting this plan to CDFW.

4.7 Notification to the California Natural Diversity Database (CNDDB). If any listed, rare, or special status species are detected during project surveys or on or around the project site during covered activities, the Permittee shall submit CNDDB Field Survey Forms to CDFW in the manner described at the CNDDB website (http://www.wildlife.ca.gov/biogeodata/cnddb/submitting_data_to_cnddb.asp) annually ~~within 14 working days of the sightings~~. Copies of such submittals shall also be submitted to the CDFW regional office as specified below.

4.8 List of Nonnative Species. Permittee shall annually submit to CDFW ~~within two weeks of project completion~~, a list of ~~location~~ projects and species treated under the District's Integrated Pest Management Program ~~for any nonnative invasive species found in the Project area~~.

CONTACT INFORMATION

Any communication that Permittee or CDFW submits to the other shall be in writing and any communication or documentation shall be delivered to the address below by U.S. mail, fax, or email, or to such other address as Permittee or CDFW specifies by written notice to the other.

To Permittee:

Natural Resources Department Manager
Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

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(650) 691-1200
klenington@openspace.org

To CDFW:

California Department of Fish and Wildlife
Bay Delta Region
7329 Silverado Trail
Napa, California 94558
Attn: Lake and Streambed Alteration Program – Randi Adair or Kristin Garrison
~~Suzanne DeLeon~~
Notification #1600-2012-0444-R3
Fax (707) 944-5553
Randi.Adair@wildlife.ca.gov
Kristin.Garrison@wildlife.ca.gov
~~Suzanne.DeLeon@wildlife.ca.gov~~

LIABILITY

Permittee shall be solely liable for any violations of the Agreement, whether committed by Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents or contractors and subcontractors, to complete the project or any activity related to it that the Agreement authorizes.

This Agreement does not constitute CDFW's endorsement of, or require Permittee to proceed with the project. The decision to proceed with the project is Permittee's alone.

SUSPENSION AND REVOCATION

CDFW may suspend or revoke in its entirety the Agreement if it determines that Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, is not in compliance with the Agreement.

Before CDFW suspends or revokes the Agreement, it shall provide Permittee written notice by certified or registered mail that it intends to suspend or revoke. The notice shall state the reason(s) for the proposed suspension or revocation, provide Permittee an opportunity to correct any deficiency before CDFW suspends or revokes the Agreement, and include instructions to Permittee, if necessary, including but not limited to a directive to immediately cease the specific activity or activities that caused CDFW to issue the notice.

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ENFORCEMENT

Nothing in the Agreement precludes CDFW from pursuing an enforcement action against Permittee instead of, or in addition to, suspending or revoking the Agreement.

Nothing in the Agreement limits or otherwise affects CDFW's enforcement authority or that of its enforcement personnel.

OTHER LEGAL OBLIGATIONS

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from obtaining any other permits or authorizations that might be required under other federal, state, or local laws or regulations before beginning the project or an activity related to it.

This Agreement does not relieve Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, from complying with other applicable statutes in the FGC including, but not limited to, FGC sections 2050 et seq. (threatened and endangered species), 3503 (bird nests and eggs), 3503.5 (birds of prey), 5650 (water pollution), 5652 (refuse disposal into water), 5901 (fish passage), 5937 (sufficient water for fish), and 5948 (obstruction of stream).

Nothing in the Agreement authorizes Permittee or any person acting on behalf of Permittee, including its officers, employees, representatives, agents, or contractors and subcontractors, to trespass.

AMENDMENT

CDFW may amend the Agreement at any time during its term if CDFW determines the amendment is necessary to protect an existing fish or wildlife resource.

Permittee may amend the Agreement at any time during its term, provided the amendment is mutually agreed to in writing by CDFW and Permittee. To request an amendment, Permittee shall submit to CDFW a completed CDFW “Request to Amend Lake or Streambed Alteration” form and include with the completed form payment of the corresponding amendment fee identified in CDFW’s current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

TRANSFER AND ASSIGNMENT

This Agreement may not be transferred or assigned to another entity, and any purported transfer or assignment of the Agreement to another entity shall not be valid or effective,

unless the transfer or assignment is requested by Permittee in writing, as specified below, and thereafter CDFW approves the transfer or assignment in writing.

The transfer or assignment of the Agreement to another entity shall constitute a minor amendment, and therefore to request a transfer or assignment, Permittee shall submit to CDFW a completed CDFW "Request to Amend Lake or Streambed Alteration" form and include with the completed form payment of the minor amendment fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5).

EXTENSIONS

In accordance with FGC section 1605(b), Permittee may request one extension of the Agreement, provided the request is made prior to the expiration of the Agreement's term. To request an extension, Permittee shall submit to CDFW a completed CDFW "Request to Extend Lake or Streambed Alteration" form and include with the completed form payment of the extension fee identified in CDFW's current fee schedule (see Cal. Code Regs., tit. 14, § 699.5). CDFW shall process the extension request in accordance with FGC 1605(b) through (e).

If Permittee fails to submit a request to extend the Agreement prior to its expiration, Permittee must submit a new notification and notification fee before beginning or continuing the project the Agreement covers [FGC, §1605, subd. (f)].

EFFECTIVE DATE

The Agreement becomes effective on the date of CDFW's signature, which shall be: 1) after Permittee's signature; 2) after CDFW complies with all applicable requirements under the California Environmental Quality Act (CEQA); and 3) after payment of the applicable FGC section 711.4 filing fee listed at http://www.wildlife.ca.gov/habcon/ceqa/ceqa_changes.html.

TERM

This Agreement shall expire on **December 31, 2022** unless it is terminated or extended before then. All provisions in the Agreement shall remain in force throughout its term. Permittee shall remain responsible for implementing any provisions specified herein to protect fish and wildlife resources after the Agreement expires or is terminated, as FGC section 1605(a)(2) requires.

EXHIBITS

The documents listed below are included as exhibits to the Agreement and incorporated herein by reference.

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A. Mapbook of District Preserves
B. Midpeninsula Regional Open Space District Best Management Practices for Routine Maintenance Activities in Water Courses, 2018 ~~2008~~
C. Definition of Terms
D. Annual Notifications of Proposed Work (reserved for future exhibits)
E. USFWS Recovery Permit Number: TE225974-2, dated 12/22/16
F. CDFW Memorandum of Understanding "Research and Recovery of San Francisco Garter Snake and California Tiger Salamander" dated April 6, 2017

AUTHORITY

If the person signing the Agreement (signatory) is doing so as a representative of Permittee, the signatory hereby acknowledges that he or she is doing so on Permittee's behalf and represents and warrants that he or she has the authority to legally bind Permittee to the provisions herein.

AUTHORIZATION

This Agreement authorizes only the project described herein. If Permittee begins or completes a project different from the project the Agreement authorizes, Permittee may be subject to civil or criminal prosecution for failing to notify CDFW in accordance with FGC section 1602.

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CONCURRENCE

The undersigned accepts and agrees to comply with all provisions contained herein.

FOR MIDPENINSULA OPEN SPACE DISTRICT

Original Agreement signed by

Kirk Lennington — Date

Permittee

FOR DEPARTMENT OF FISH AND WILDLIFE

Original Agreement signed by

Craig J. Weightman — Date

Environmental Program Manager

Prepared by: Suzanne DeLeon
Environmental Scientist

Date Sent: March 27, 2013; August 20, 2013

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Exhibit C. Definition of Terms

Definitions:

Debris: non-living vegetative or woody matter, trash, concrete rubble, etc. This definition does not include living vegetation.

Emergency project: is defined in the State Fish and Game Code, section 1600.

Fire Road/Unimproved vehicle width trail: Similar to narrow width trails, but up to 12' wide with natural surfaces (or baserock). These tracks are intended to allow access for emergency & maintenance vehicles.

Heavy equipment: any equipment used that is larger than a pick-up truck.

Improved Road: Accessible to all types of vehicles. They are of various widths, but not less than 12' wide, with paved surfaces and a minimum 2' shoulder on each side

Narrow width trail:- This is the standard trail, approximately 4-6' wide with a natural, or baserock, surface.

Natural channel: a stream or watercourse that has not been modified by human acts such as lining the channel with cement, or creating an artificial channel for drainage or flood control. A natural channel may have in it erosion control structures, culverts or other minor modifications.

Paved Roads: These allow more users to access Preserve lands. They are generally 12-16' in width, paved, and have a baserock or natural surface shoulder on each side.