MITIGATED NEGATIVE DECLARATION

Marin County Environmental Review

Pursuant to Section 21000 et. seq. of the Public Resources Code and Marin County Environmental Impact Review Guidelines and Procedures, a Negative Declaration is hereby granted for the following project.

1. Project Name: Muir Woods Road Improvement Project

2. Location: Muir Woods Road, from the entrance of Muir Woods National Monument to the intersection with California Highway 1

3. Project Summary: The Federal Highway Administration–Central Federal Lands Highway Division, in cooperation with the Marin County Department of Public Works, the National Park Service, and the California Department of Parks and Recreation, is proposing to improve a segment of Muir Woods Road in Marin County. Proposed improvements include resurfacing, restoring, and rehabilitating the roadway; stabilizing slopes; and replacing the existing bridge over Redwood Creek.

4. Project Sponsor: Marin County Department of Public Works

5. Finding:

   Based on the attached Initial Study and without a public hearing, it is my judgment that:

   ☐ The project will not have a significant effect on the environment.

   ☒ The significant effects of the project noted in the Initial Study attached have been mitigated by modifications to the project so that the potential adverse effects are reduced to a point where no significant effects would occur.

Rachel Reid _____ Date: April 22, 2026

Rachel Reid
Environmental Planning Manager

Based on the attached Initial Study, a Mitigated Negative Declaration is granted.

_____ Date: _____

Marin County Board of Supervisors

1. Mitigation Measures:

   ☐ No potential adverse impacts were identified; and therefore, no mitigation measures are required.

   ☒ Please refer to mitigation measures in the attached Initial Study.

   ☒ The potential adverse impacts have been found to be mitigable as noted under the following factors in the Initial Study attached.

   All of the mitigation measures for the impacts listed above have been incorporated into the project and are required as conditions of approval.

2. Preparation:

   This Mitigated Negative Declaration was prepared by Jacobs on behalf of the Marin County Department of Public Works. Copies may be obtained at the address listed below.

   Marin County Department of Public Works
   Engineering Division
   3501 Civic Center Drive, Suite 304
   San Rafael, CA 94903
   (415) 473-6530

   Check with the Marin County Department of Public Works for information about business hours and/or reviewing copies of the document at the front counter.

   An electronic version is also available for review on the County of Marin Environmental Planning website.

MARIN COUNTY
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

DRAFT INITIAL STUDY
WITH PROPOSED MITIGATED NEGATIVE DECLARATION
MUIR WOODS ROAD IMPROVEMENT PROJECT

I. Background

A. Project Sponsor: Marin County Department of Public Works (CEQA Lead Agency / facility owner), in cooperation with FHWA-CFLHD (federal project proponent and delivery agency)
Project Sponsor's Address: 3501 Civic Center Drive, Suite 404

B. CEQA Lead Agency Name: Marin County Department of Public Works
CEQA Lead Agency Address: 3501 Civic Center Drive, Suite 404

C. CEQA Lead Agency Contact Name: Rachel Calvert
CEQA Lead Agency Contact Phone: (415) 246-5017
CEQA Lead Agency Contact Email: Rachel.Calvert@MarinCounty.gov

II. Project Description

A. Project Title/ID: Muir Woods Road Improvement Project

B. Type of Application(s): Federal Lands Access Program

C. Project Location Address: Muir Woods Road, from the entrance of Muir Woods National Monument to the intersection with California Highway 1

Project Location Assessor's Parcel Number(s): Marin County ROW and APNs 199-030-07, 199-070-12, 199-070-17, 199-070-18, 199-080-16, 199-102-14, 199-131-01, 199-141-03, 199-141-04, 199-150-07, 199-150-25, 199-150-29, and 199-150-30

D. General Plan Designation: Open Space (OS)

E. Zoning: Road Right-of-Way Adjacent to Open Area (OA)

F. Description of Project: Proposed improvements include resurfacing, restoring, and rehabilitating the roadway; stabilizing slopes; and replacing the existing bridge over Redwood Creek

A. Introduction

The Federal Highway Administration–Central Federal Lands Highway Division (FHWA-CFLHD), in cooperation with the Marin County Department of Public Works (Marin County), the National Park Service (NPS), and California Department of Parks and Recreation (CDPR), is proposing to improve a segment of Muir Woods Road in Marin County. Muir Woods Road is also known as Frank Valley Road; however, it is referred to as Muir Woods Road for the purpose of this Draft Initial Study (IS) with Proposed Mitigated Negative Declaration (MND). Muir Woods Road is a narrow, two-lane, rural roadway that connects the Muir Woods National Monument (MWNM) to California Highway 1 (CA1). The road is owned and maintained by Marin County, and it serves as the primary access route to MWNM (NPS 2022a). The road also provides access to the Mount Tamalpais State Park, which is managed by the CDPR, Golden Gate National Recreation Area (GGNRA), and to the Panoramic Highway. MWNM is located within GGNRA's administrative boundary; both MWNM (approximately 554 acres) and GGNRA (approximately 82,000 acres) are federally owned and managed by the NPS.

This Draft IS with Proposed MND has been developed to meet Marin County's obligations as the lead agency under the California Environmental Quality Act (CEQA) and Marin County's Environmental Impact Review Guidelines. Marin County's role as CEQA lead agency is limited to state environmental review and does not constitute authorization of construction activities or impacts addressed under federal law. Marin County is responsible for providing technical information and data to FHWA-CFLHD. Marin County is also responsible for reviewing plans and environmental documents for purposes of CEQA compliance and coordination with FHWA-CFLHD. NPS and the CDPR, as CEQA responsible agencies and the agencies responsible for managing lands surrounding Muir Woods Road, have been involved in all aspects of planning for the Muir Woods Road Improvement Project (Proposed Project).

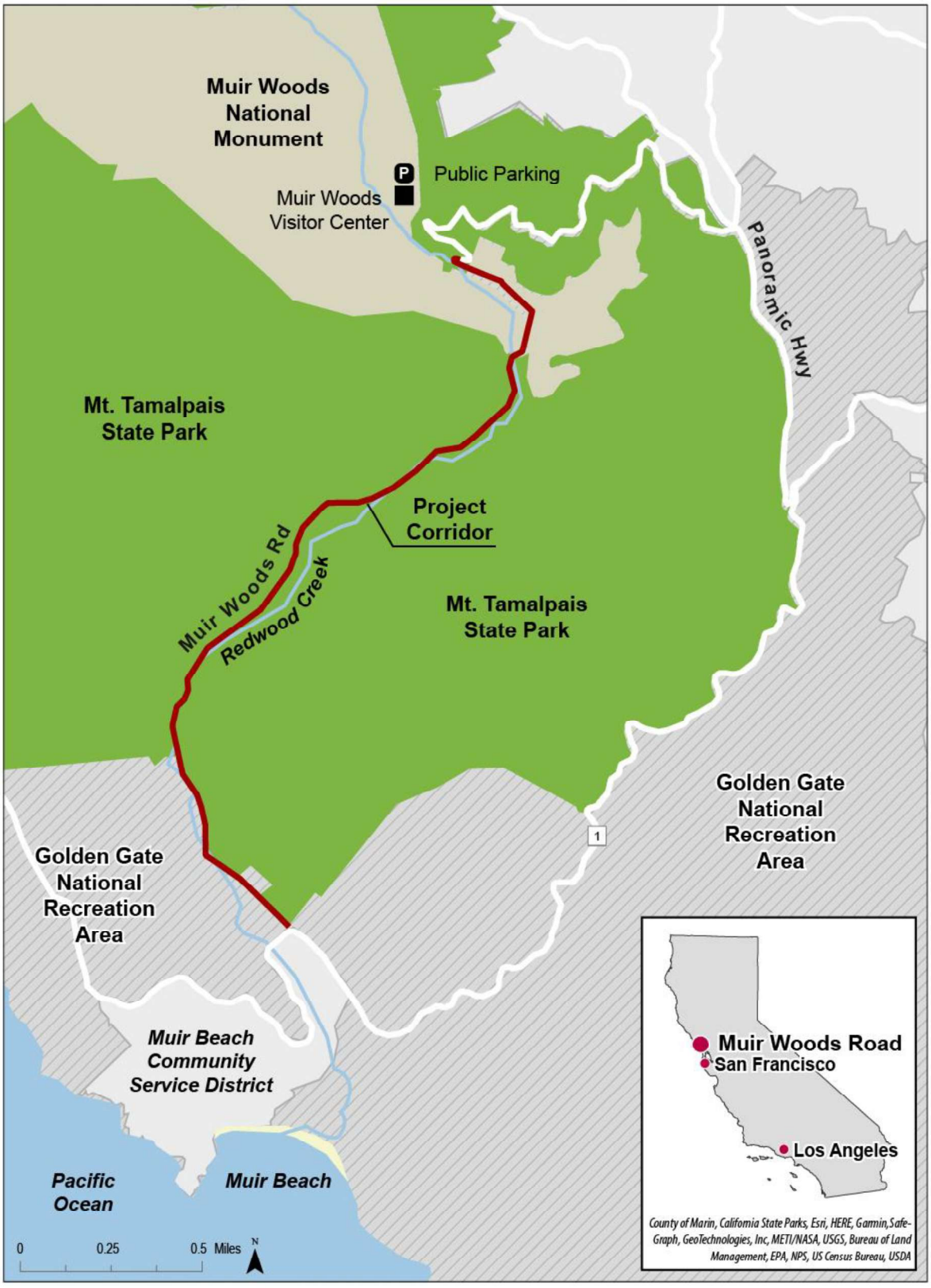
FHWA-CFLHD is the lead federal agency for compliance with the National Environmental Policy Act and has prepared an Environmental Assessment concurrent with preparation of Marin County's Draft IS with Proposed MND to support environmental compliance requirements for the Proposed Project.

Chapters I through IV of this Draft IS with Proposed MND present the Proposed Project background and project description, circulation and review, and an evaluation of environmental impacts and mitigation measures. The evaluations are grouped by resource areas consistent with those from the checklist in Appendix G to the 2025 State CEQA Guidelines. Chapter V presents the Determination, Chapter VI lists the documents incorporated by reference, and Chapter VII lists the acronyms and abbreviations used in this Draft IS with Proposed MND.

B. Project Overview

The Proposed Project begins at the entrance of MWNM and extends approximately 2.4 miles south where it intersects with CA-1 (Figure 1).

Figure 1. Project Location



The proposed improvements primarily consist of resurfacing, restoring, and rehabilitating the roadway. Improvements include replacing and realigning a substandard bridge over Redwood Creek; formalizing a segment of the Redwood Creek Trail along the roadway; stabilizing the roadway embankment in areas of slope failure; and implementing drainage improvements consisting of culvert repair, culvert replacement, and culvert outfall protection. The Proposed Project would also include signing and striping.

The Proposed Project is located within an environmentally sensitive area. The existing Muir Woods Road is located within a valley along Redwood Creek. The creek provides aquatic habitat for protected species of fish, reptiles, and amphibians. The area immediately adjacent to Redwood Creek consists of woodlands, scrub/shrub, and riparian habitats, which provide habitat for protected species of birds, mammals, and invertebrates. The area also has a rich cultural history and provides scenic and recreational opportunities for the public.

To begin the CEQA processes, the lead agency identified the Proposed Project description for the purposes of CEQA compliance and prepared this Draft IS with Proposed MND to identify the environmental impacts of the Proposed Project. This Draft IS with Proposed MND has been prepared in accordance with CEQA provisions to analyze the environmental factors potentially affected by the Proposed Project so that the agencies can take these impacts into account when considering action on the Proposed Project.

CEQA was enacted in 1970 to provide decision makers and the public with information regarding the environmental impacts of proposed projects, identifying means of avoiding environmental damage, and disclosing to the public the reasons behind a project's approval even if it leads to environmental damage. CEQA requires agencies to identify the significant environmental impacts of proposed projects and to avoid, minimize, or mitigate those impacts, if feasible. Marin County has determined that the Proposed Project is subject to CEQA, and no exemptions apply. Therefore, preparation of an IS is required. An IS is a preliminary analysis conducted by the lead agency, in consultation with other agencies (responsible or trustee agencies, as applicable), to determine whether there is substantial evidence that a project may have a significant effect on the environment. If the IS concludes that the Proposed Project may have a significant effect on the environment that cannot be mitigated, an Environmental Impact Report (EIR) should be prepared; otherwise, the lead agency may adopt a negative declaration or MND.

As the agencies responsible for managing lands surrounding Muir Woods Road, the NPS and the CDPR have been involved in all aspects of planning for the Proposed Project. Staff from both agencies attended the public scoping meeting, participated in onsite design reviews of the proposed design, and provided input on this Draft IS with Proposed MND before it was released to the public. These agencies worked

cooperatively with Marin County and FHWA-CFLHD to ensure improvements to Muir Woods Road meet the objectives of the Proposed Project while avoiding and minimizing impacts to the environment. As the lead agency under CEQA for the Proposed Project, Marin County is responsible for identifying the environmentally superior alternative for purposes of CEQA compliance, in coordination with FHWA-CFLHD.

C. Project Objectives

The Proposed Project objectives include the following:

- Restore the structural integrity of a 2.4-mile segment of Muir Woods Road.
- Enhance road safety for all users.
- Correct road-related drainage problems.
- Reduce water quality impacts to Redwood Creek.
- Reduce ongoing road maintenance requirements.

Muir Woods Road is badly deteriorated and in need of repair. Pavement along the road is heavily damaged because of poor drainage, and many areas have severe cracking, deteriorated edges, and low shoulders. Existing road widths are substandard, varying from 18 feet to 24 feet. The topography, failing culverts, and proximity to Redwood Creek have created compromised road embankment slopes at several locations. The bridge over Redwood Creek, at the north end of the Proposed Project site near the MWNM entrance, does not meet current standards. The specific details driving the objectives for the Proposed Project are described in the following sections.

1. Pavement Deterioration

The existing pavement is in very poor condition over much of the Proposed Project length. Pavement thickness throughout this section of roadway varies from 3 inches to more than 9 inches in patched areas and does not have a formal base material. As shown on Photo 1, there is low- to moderate-severity thermal transverse and longitudinal cracking at the centerline, edge cracking and sloughing, and very low-severity fatigue cracking. Thermal cracking is a result of pavement aging, while fatigue cracking is caused by subgrade softening. This softening process could be caused by water entering the subgrade. Edge cracking at locations throughout the Proposed Project length appears to be a result of decreased lateral support caused by the loss of shoulder material.

Photo 1. Pavement Deterioration



Substandard Roadway Width

Existing road widths are substandard, varying from 18 feet to 24 feet. Photo 2 shows the narrow road width with limited to no shoulder. For this type of facility, a minimum 10-foot lane width is recommended per American Association of State Highway and Transportation Officials (AASHTO) standards. The narrow lane widths make it difficult for vehicles to safely pass bicyclists, and the narrow, irregular shoulders do not provide an area for bicyclists to ride outside of the vehicle lane. Buses, large trucks, and vehicles track off the roadway or cross into the oncoming lane on several tight curves because of the insufficient lane width.

Photo 2. Narrow Road Width



Slope Failures

Muir Woods Road follows the Redwood Creek drainage throughout the length of the Proposed Project area (Figure 1). The meandering nature of Redwood Creek and its proximity to Muir Woods Road has impacted the road at several locations. The creek's natural flows and storm-related high-water levels have eroded and undermined roadway embankment slopes in several locations. In two locations, slope failures have required lane reductions to one travel lane (Photo 3).

Photo 3. Lane Closure due to Slope Failure



Visitor overflow parking and frequent vehicular and pedestrian use of the unpaved road shoulder have damaged vegetation and exposed soils, which has led to increased sedimentation flowing into Redwood Creek.

Poorly Performing Culverts

Along the 2.4-mile Proposed Project area, engineers estimate that all 36 existing culverts are performing inadequately, showing signs of sedimentation and degradation. Photo 4 shows the degraded condition of one culvert. Other observed issues with culverts include abrasion, rusting, bottom failure, and sediment deposits at inlets. In some locations, culverts are too short to accommodate a wider roadway.

Photo 4. Degraded Culvert



Substandard Bridge over Redwood Creek

The existing bridge over Redwood Creek is in the northern part of the Proposed Project area, approximately 2 miles north of CA-1 and near the entrance to MWNM (Figure 1). The bridge (Photo 5) consists of a single-span, 23-foot-long, reinforced concrete T-beam structure with strutted closed-in abutments and wingwalls on spread footings. The bridge was constructed in 1946 and has exposed bridge footings, deteriorated concrete, and corroded and exposed rebar. The bridge railings are substandard, and no guardrails are provided at the bridge approaches. Additionally, the roadway and bridge do not meet current AASHTO standards because of the narrow width, approach roadway geometry, and sight distance.

Photo 5. Substandard Redwood Creek Bridge



2. Project Funding

The Muir Woods Road Improvement Project is administered under the Federal Lands Access Program (FLAP), which was established under Section 1119 of the 2012 Moving Ahead for Progress in the 21st Century Act (MAP-21) and continued under the 2015 Fixing America's Surface Transportation Act (FAST Act). A federal lands access transportation facility is a public highway, road, bridge, trail, or transit system that is on, is adjacent to, or provides access to federal lands for which title or maintenance responsibility is vested in a state, county, town, township, tribal, municipal, or local government. The FLAP supplements state and local resources to improve public transportation facilities with an emphasis on high-use recreation and economic generators.

The proposed road improvements were placed in the FLAP in 2015, with committed local matching funds provided by Marin County. The total estimated cost for design and construction of the road is approximately $12.0 million. Construction funding is currently programmed for federal fiscal year 2027.

The proposed bridge replacement is funded through the Highway Bridge Program. The bridge replacement would be delivered by FHWA-CFLHD, which is responsible for environmental compliance, design, right-of-way, construction procurement, and construction administration. Marin County will retain ownership of the bridge and will assume long-term operation and maintenance responsibility following construction. The total estimated cost for design and construction of the bridge replacement is approximately $6.0 million, with funding programmed for federal fiscal year 2027.

D. Alternatives

This section describes the Proposed Project and the alternatives that were analyzed to meet the project objectives while avoiding or minimizing environmental impacts. The alternatives evaluated in this Draft IS with Proposed MND include the No-Build Alternative and the Proposed Project.

1. Alternatives Evaluated for Impacts in this Draft IS with Proposed MND

CEQA requires agencies to analyze the consequences of not approving the Proposed Project, which is represented by the No-Build Alternative. The No-Build Alternative also serves as a baseline for comparing impacts of the Proposed Project.

No-Build Alternative

The No-Build Alternative would include the following activities:

- Routine maintenance would continue to be performed to address pavement edge damage caused by substandard roadway widths and to repair general pavement damage, such as cracking, deteriorated edges, and low shoulders.
- Minor pavement patching and overlays would continue as part of routine roadway maintenance.
- In compliance with the June 30, 2015 Memorandum of Understanding between the NPS and Marin County, existing interagency coordination would continue to protect, preserve, and enhance the health of the Redwood Creek watershed, reduce traffic congestion on the road, improve traffic and pedestrian safety, and increase local transit.

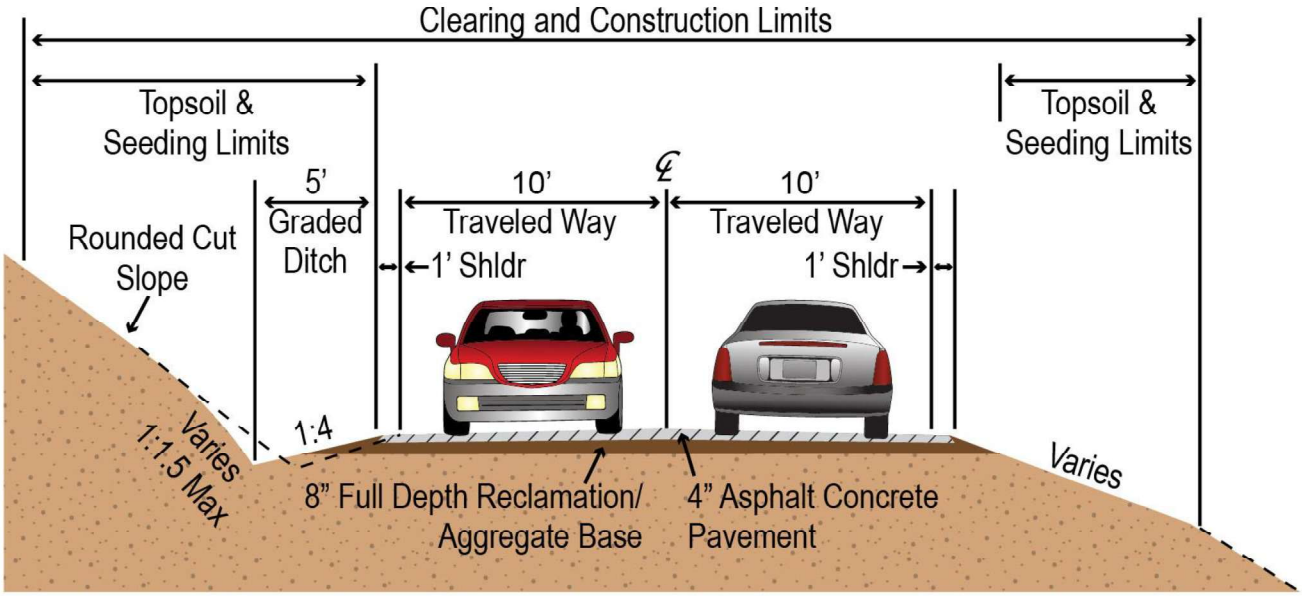
Under the No-Build Alternative, existing areas of eroded and undermined roadway embankment slopes would remain unrepaired and cordoned off with flexible delineators to guide traffic away from unsafe areas of the roadway. Existing variable lane widths would not be corrected, and the deficient structural integrity of the roadway and road-related drainage issues such as slope failures and damaged culverts would not be addressed. The substandard Redwood Creek bridge would not be replaced or realigned. The bridge would continue to degrade and the substandard approach roadway geometry and sight distance in that area would not be improved, resulting in continued safety issues.

Proposed Project

Roadway and Drainage Improvements

The Proposed Project primarily consists of resurfacing, restoring, and rehabilitating a 2.4-mile segment of Muir Woods Road. The improvements would closely follow the existing roadway to the extent practicable to minimize impacts. Overall, the Proposed Project would widen the road between 1 and 4 feet to achieve a consistent 22-foot paved width and would include two 10-foot travel lanes with two 1-foot shoulders (Figure 2). Road widening would include pulverizing existing pavement with asphalt emulsion, overlaying with recycled and new asphalt pavement, reconditioning ditches (regrading and removing vegetative debris to improve flows), and striping. Paved ditches with asphalt curbs would be included in select locations to minimize cut slopes. The clear zone, which is the area available for use by errant vehicles, would vary between 2 feet and 5 feet, depending on existing terrain constraints. Crosswalks would be provided at trail crossing locations.

Figure 2. Proposed Typical Section



Approximately 36 culverts would be replaced or repaired, and riprap aprons would be installed for scour protection to improve roadway drainage. Where the existing right-of-way (ROW) is constrained, headwalls may be installed at culvert inlets and outlets to minimize the need for permanent drainage easements. Replacement culverts would generally range in size from 15 to 48 inches in diameter. Permanent stormwater treatment measures, such as biostrips and bioswales, would be implemented as feasible.

The proposed improvements generally would occur within the 50-foot-wide ROW maintained by Marin County. Permanent ROW would be acquired by Marin County, as needed, to support the federally delivered bridge replacement and road realignment. In addition, permanent easements will be required to accommodate roadway and drainage improvements. Construction of the proposed improvements is proposed to occur over a 2-year period, separated into two construction seasons to accommodate environmental timing restrictions and seasonal constraints. Generally, at least one lane of traffic would remain open during construction with a maximum delay of 30 minutes. Short-duration full-road closures may be implemented to improve safety. Closures would be limited in duration and timed to minimize impacts to the traveling public. Construction staging areas have not been identified at this time; however, staging areas would be sited in previously disturbed areas and would be sited to avoid and/or minimize sensitive resources such as areas of intact native plant communities, wetlands, special-status species habitat, and cultural resources.

Bridge Replacement/Realignment

Based on the preliminary design, the existing bridge would be replaced with a 45-foot-wide by 105-foot-long steel I-girder bridge with non-integral abutments founded on drill shafts. The bridge would consist of two 10-foot travel lanes, two 5-foot shoulders, and one 6-foot-wide paved sidewalk (Figure 3). The bridge and roadway approaches would be replaced to improve sight distance and meet current roadway design standards. Approximately 400 linear feet of the road would be realigned up to 100 feet to the southeast (Figure 4).

Figure 3. Proposed Typical Section for Bridge and Bridge Approaches

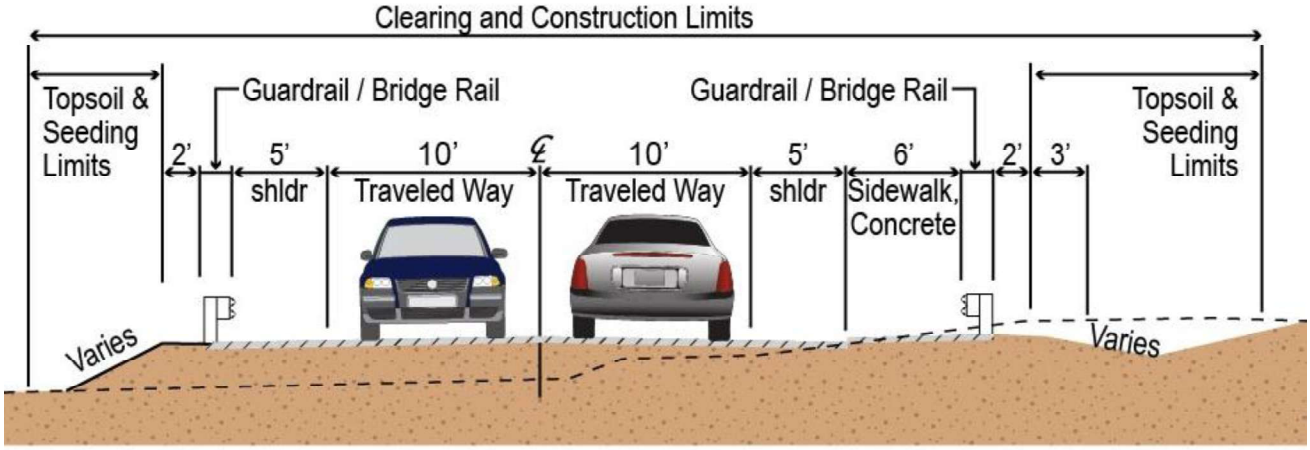
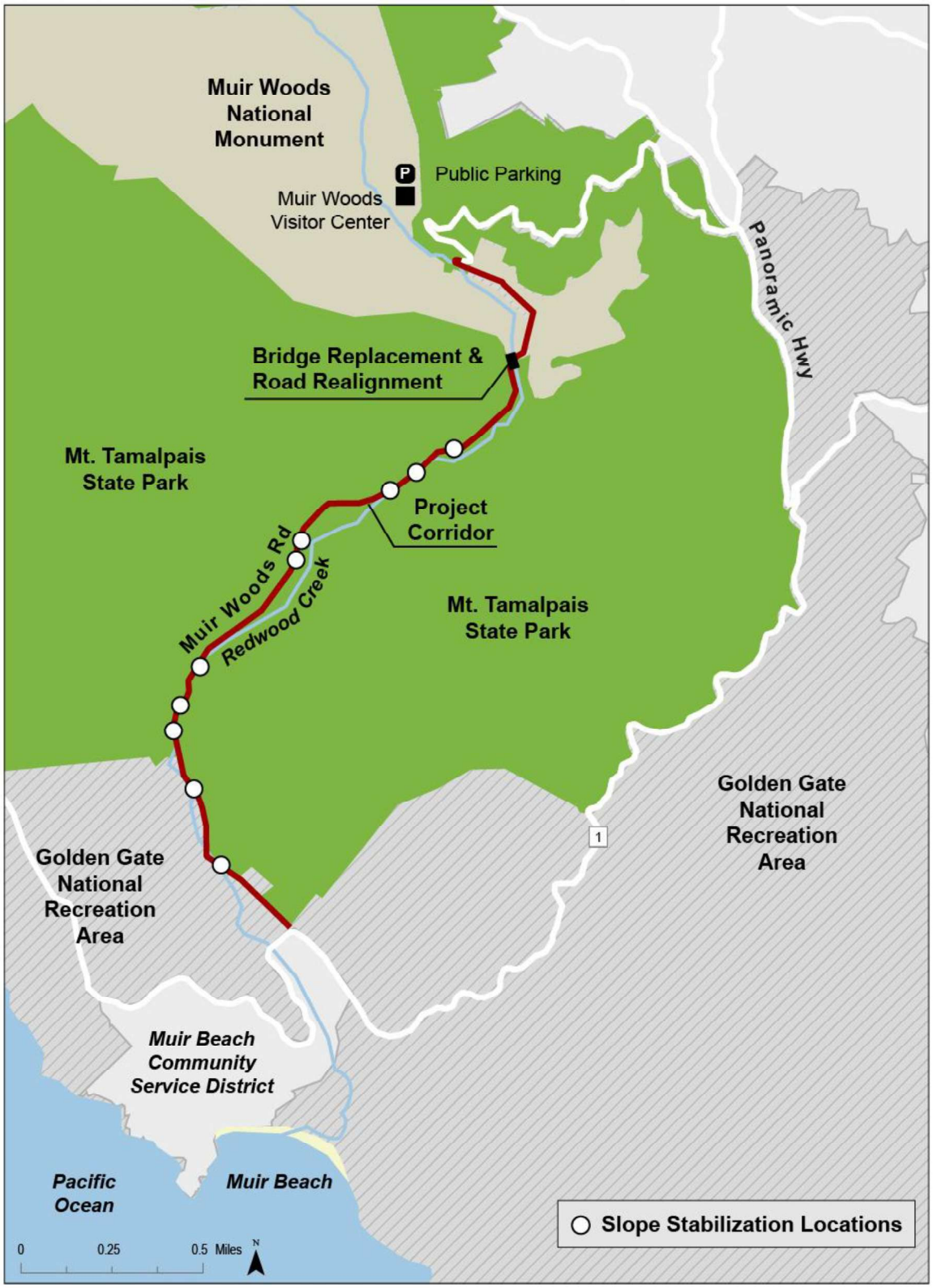


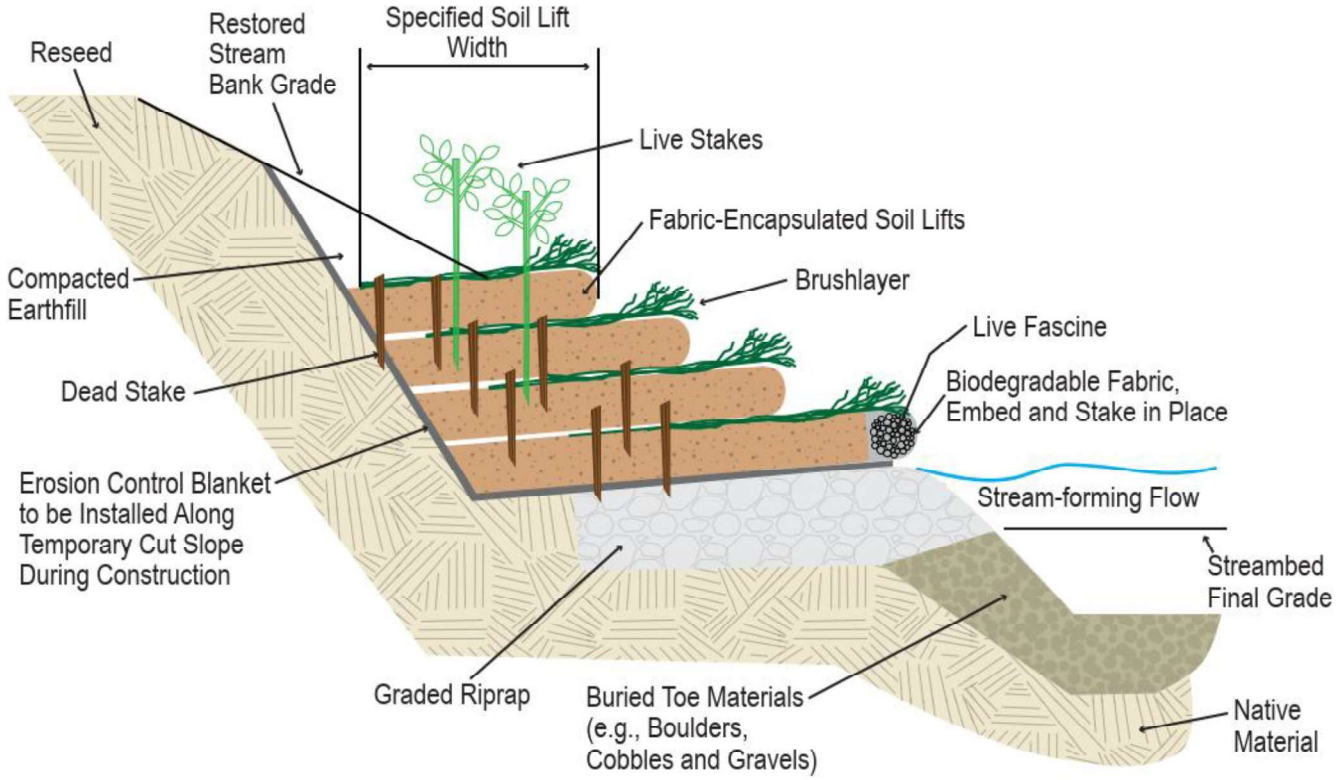
Figure 4. Bridge Replacement, Road Realignment, and Slope Stabilization Locations



New guardrail and barriers would be installed along the bridge to improve safety for vehicles, pedestrians, and bicyclists. The replacement bridge over Redwood Creek would include a raised concrete sidewalk along its northwest side that would extend south approximately 240 feet, transition to an aggregate surface for approximately 600 feet, and connect to Deer Park Fire Road. The concrete sidewalk would also extend north from the bridge approximately 80 feet, transition to an aggregate surface for approximately 1,900 feet, and connect to NPS's planned Redwood Creek Trail, which would be constructed as part of a separate NPS project.

The abandoned portion of the road would be obliterated and reclaimed. Following removal of the existing bridge and abutments, the Redwood Creek streambanks would be regraded and stabilized with fabric-encapsulated soil lifts (FESLs) (Figure 5). FESLs are composed of soil wrapped in geotextile fabrics that are staked in place to reconstruct and stabilize banks. Natural materials—such as live willow stakes, willow fascines or bundles, brush layers, and boulders and cobbles—would be incorporated to achieve a naturally stabilized bank. The FESLs would be installed in the area between the removed bridge and proposed replacement bridge abutments. Rock riprap would be incorporated at the toe of slope and at the bridge abutments for scour protection.

Figure 5. Typical Fabric-Encapsulated Soil Lift

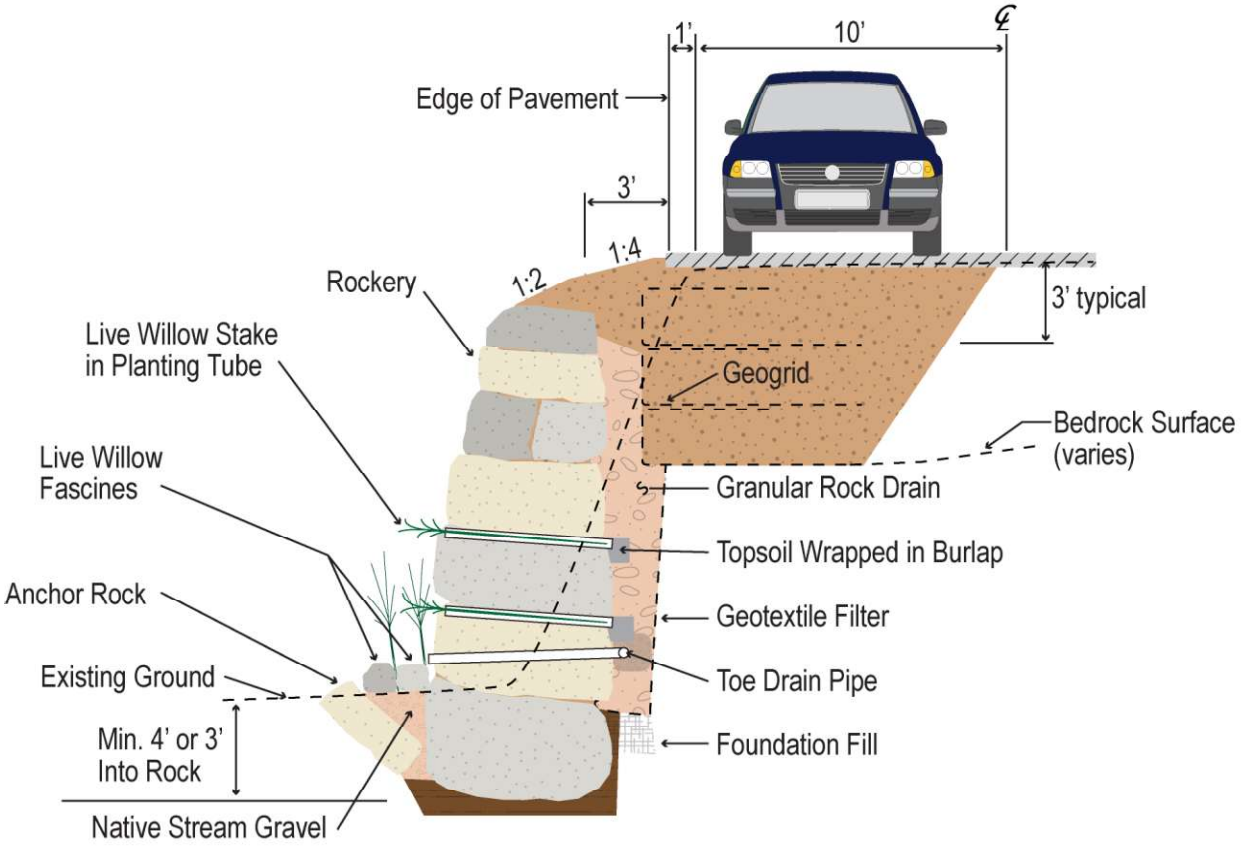


Slope Stabilization

The road embankment has failed or is at risk of failure at several locations where flows from Redwood Creek have eroded the embankment and compromised the condition and safety of the roadway. The Proposed Project would repair and stabilize up to 10 areas where roadway slope failure has occurred (Figure 4). Proposed slope stabilization methods include the following:

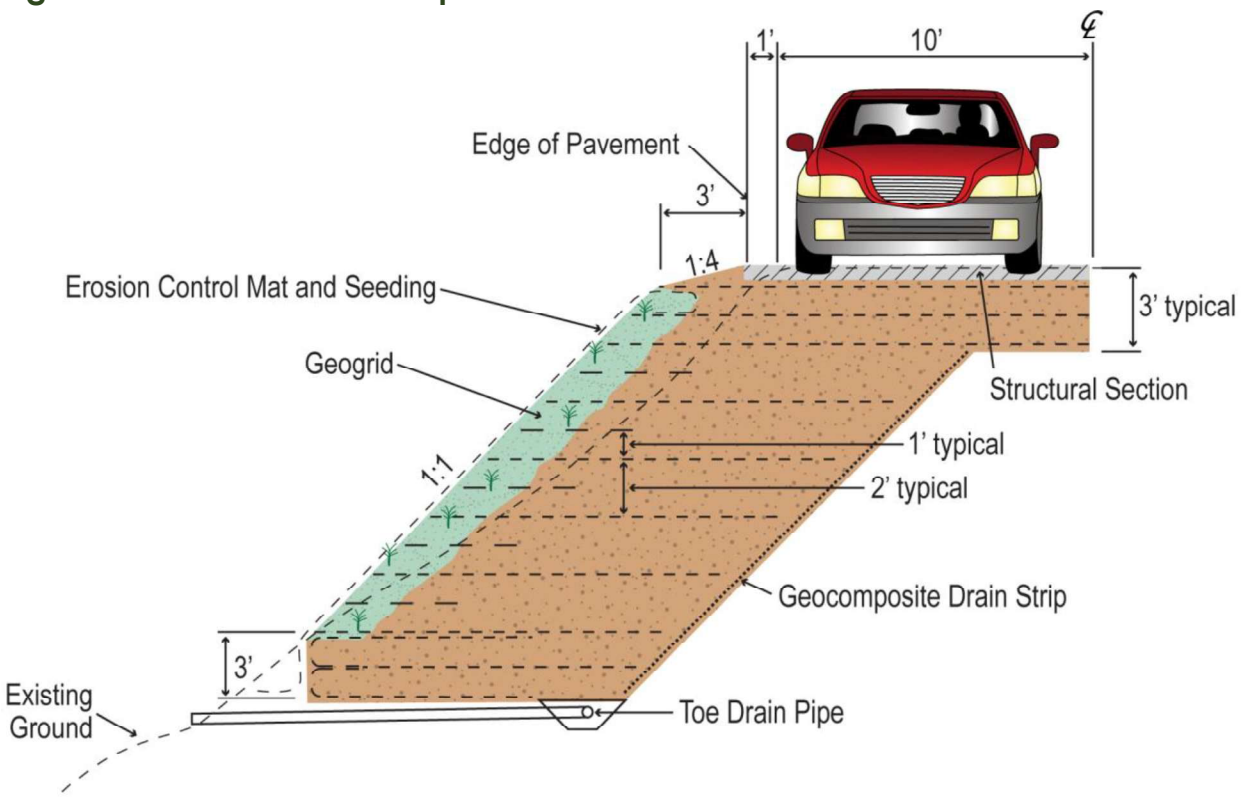
- Biotechnical rockery (Figure 6): This treatment consists of a rockery retaining wall composed of natural materials such as live willow stakes, willow fascines or bundles, and large rock. The toe of the slope would be buried below grade and willow fascines or bundles would be included at the toe of slope to prevent scour. This treatment would be applied in areas that require a narrower footprint and a steeper slope (4 vertical to 1 horizontal ratio) to limit encroachment into the creek.

Figure 6. Biotechnical Rockery Slope Stabilization



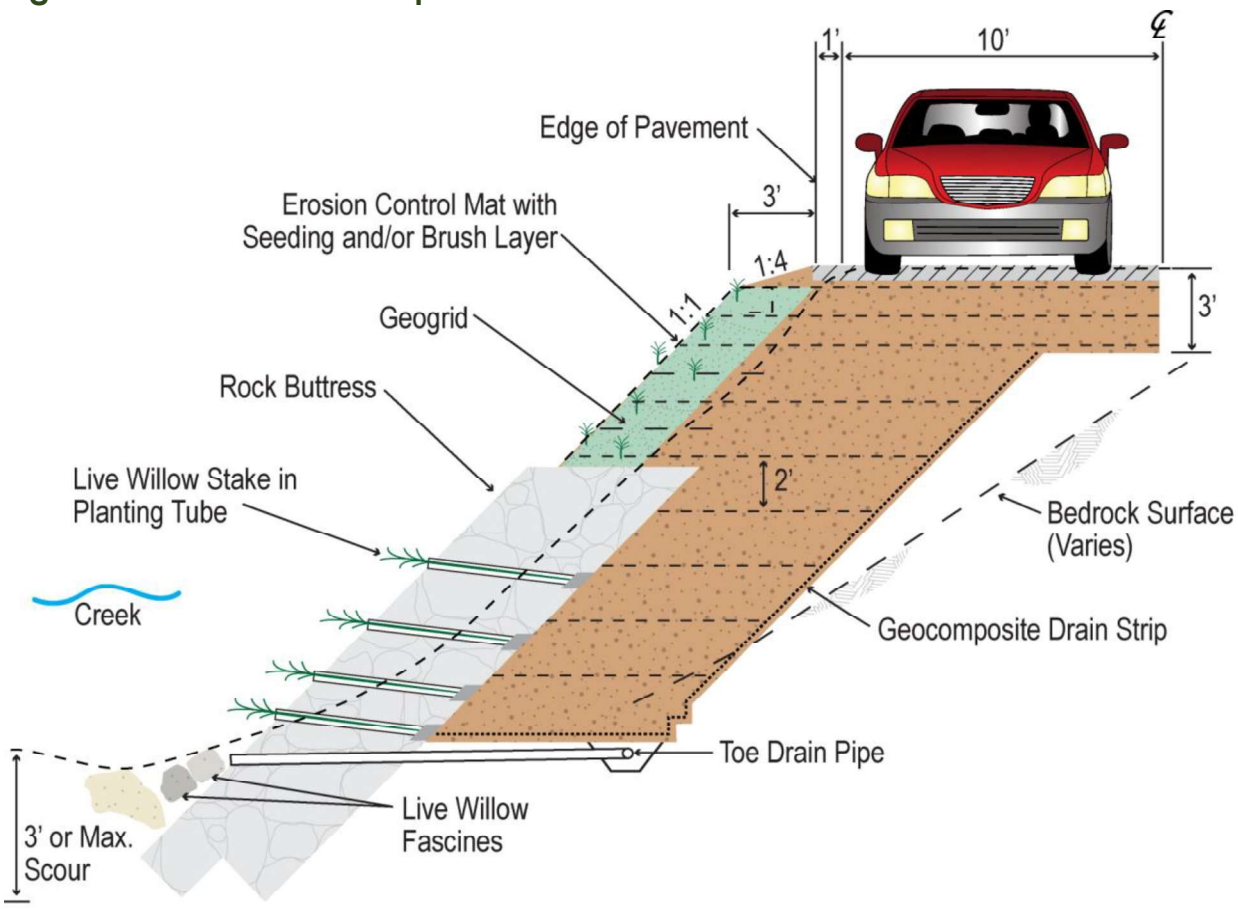
- Reinforced soil slopes (RSS) (Figure 7): This treatment consists of steepened (1 vertical to 1 horizontal ratio), compacted soil slopes that are stabilized using layers of geogrid reinforcement. Seeding would be applied to revegetate the slope. In addition to correcting slope failures, RSS may be used in certain areas to support roadway widening.

Figure 7. Reinforced Soil Slopes



- Rock buttresses (Figure 8): This treatment consists of a defined thickness of rock that extends below the scour depth and up to the high-water level for a 50-year storm event. Above the high-water level, an RSS would be incorporated. Similar to other treatments, the buttresses would incorporate seeding and live willow stakes along the bank, as well as willow fascines at the toe of slope, to prevent scour.

Figure 8. Rock Buttress Slope Stabilization



Applying these treatments would be based on estimated scour and corresponding bank protection needed to adequately stabilize the slope from creek flows. Road embankment stabilization would vary in length between approximately 120 and 950 linear feet, totaling approximately 1,600 linear feet of roadway embankment stabilization. Topsoil, seeding, and mulching would be employed for disturbed areas, embankments, and RSS areas. Local plants and native seed mix would be used to revegetate slope repair areas and reduce erosion and sedimentation into the creek.

2. Right-of-Way

The ROW research and mapping conducted in 2020 revealed a discrepancy between the current operational ROW, which encompasses the existing road, and the recorded titled ROW. Following construction, the ROW record would be rectified to provide a well-

defined ROW description that precisely corresponds to the location of the final improved roadway, which would generally be consistent with the 50-foot-wide proposed operational ROW centered on the existing road. This administrative process would vacate the current documented ROW in its entirety and grant new ROW to Marin County, as the owner of the roadway, based on the existing roadway centerline and the centerline established for the Proposed Project. The corrected ROW would be agreed to by all owners of land through which the road passes. The vacated roadway ROW would revert to the adjacent landowners (United States and State of California) consistent with California state law. No net loss of public land would occur. All affected parties have agreed with this solution (Jacobs 2021a).

ROW acquisitions and permanent easements were estimated based on the recorded titled ROW. To accommodate construction and operation of the Proposed Project, permanent ROW acquisitions would be required, including approximately 0.07 acre in MWNM, approximately 0.64 acre in Mount Tamalpais State Park, and approximately 0.11 acre within GGNRA, totaling approximately 0.82 acre. In addition, the Proposed Project would require an estimated 50 permanent easements totaling approximately 1.75 acres (Table 1). The average size of these permanent easements would be approximately 0.03 acre, with the two largest easements (approximately 0.17 acre) within MWNM and Mount Tamalpais State Park. These permanent easements would be adjacent to the roadway; total counts include 6 permanent easements totaling approximately 0.35 acre within MWNM, 32 permanent easements totaling approximately 1.20 acres within the Mount Tamalpais State Park, and 12 permanent easements totaling approximately 0.20 acre within the GGNRA. In addition, temporary easements totaling approximately 0.02 acre and 0.73 acre within MWNM and Mount Tamalpais State Park, respectively, would be required for construction of the Proposed Project.

Table 1. ROW Acquisitions

Location	Total Permanent ROW (acre)	Total Permanent Easements/Acre	Total Temporary Easements (acre)
MWNM	0.07	6/0.35	0.02
Mount Tamalpais State Park	0.64	32/1.20	0.73
GGNRA	0.11	12/0.20	0.0
Total	0.82	50/1.75	0.75

3. Permits, Consultations, Determinations, and/or Approvals

Table 2 lists the permits, consultations, determinations, and/or approvals that will be required to implement the Proposed Project.

Table 2. Required Permits, Consultations, Determinations, and/or Approvals

Agency	Permit/Approval	Status
USACE, San Francisco District	CWA Section 404 nationwide permit for fill and dredge activities	Will be obtained prior to construction.
USFWS	ESA Section 7 consultation for impacts to federally threatened and endangered species	Biological Opinion issued January 17, 2025
NMFS	ESA Section 7 consultation for impacts to federally threatened and endangered species	Biological Opinion issued June 11, 2025.
CDFW	CESA Consistency Determination for state-listed species covered by ESA Section 7.	For state-listed species that are covered by ESA Section 7, Marin County anticipates obtaining a CESA Consistency Determination pursuant to Fish and Game Code Section 2080.1 prior to construction.
CDFW	CESA Incidental Take Permit for state-listed species not covered by ESA Section 7, if applicable.	If impacts to state-listed species are identified that are not covered by ESA Section 7, Marin County anticipates obtaining an Incidental Take Permit pursuant to Fish and Game Code Section 2081 prior to construction, as applicable.
California Office of Historic Preservation	Section 106 consultation for impacts to historic properties	Completed August 29, 2024.
Marin County	AB 52 consultation for impacts to tribal cultural resources	Initiated on March 2, 2021; ongoing.
CCC	Federal Consistency with the CZMA	A Negative Determination will be finalized prior to construction.
San Francisco Bay RWQCB	CWA Section 401 Water Quality Certification for discharge of dredge or fill materials into waters of the United States	Will be obtained prior to construction.
San Francisco Bay RWQCB	CWA Section 402 CGP and a SWPPP for discharge of stormwater related to construction activities	Will be obtained and finalized prior to construction.

AB = Assembly Bill
CCC = California Coastal Commission
CDFW = California Department of Fish and Wildlife
CESA = California Endangered Species Act
CGP = Construction General Permit

CWA = Clean Water Act
CZMA = Coastal Zone Management Act of 1972
ESA = Endangered Species Act
NMFS = National Marine Fisheries Service
RWQCB = Regional Water Quality Control Board
SWPPP = Stormwater Pollution Prevention Plan
USACE = U.S. Army Corps of Engineers
USFWS = U.S. Fish and Wildlife Service

III. Circulation and Review

A. Public, Agency, and Tribal Review

This section summarizes the public outreach and agency and tribal coordination conducted beginning in 2016. Marin County, FHWA-CFLHD, NPS, and CDPR coordinated throughout the environmental review process, including agency and tribal consultation to meet regulatory needs. In addition to agency and tribal outreach, the process included public involvement in the form of multiple open houses and comment periods to solicit input and feedback on the Proposed Project and associated environmental concerns. The major outreach activities are summarized in the following sections.

1. Scoping

Public and agency scoping was conducted at the onset to gather information about corridor issues, confirm the objectives for the Proposed Project, and identify sensitive resources to consider in the development of alternatives.

Public Scoping

Although not required under CEQA for preparation of an IS, a public scoping meeting was held on November 9, 2016, and included a 30-day comment period. The purpose of the meeting was to introduce the Proposed Project; obtain input on issues and concerns in the corridor, ideas for alternatives to be considered, and environmental resources potentially impacted by the Proposed Project; and to answer project questions. Overall, public input received was in favor of improving safety for all users while minimizing impacts to the natural and scenic resources in the corridor, thereby confirming the objectives developed for the Proposed Project. Other comments relevant to the meeting's purpose included a concern that an improved road would increase traffic levels to MWNM and nearby recreation trails, a desire to understand construction activities for Muir Woods Road improvements, and requests to be informed about the impacts on traffic, Redwood Creek, sensitive and special-status plant and animal species, bus and shuttle service, and access for emergency vehicles. Additionally, several comments offered various design solutions to consider for the Proposed Project.

Agency Scoping

An agency scoping meeting/site visit was held on August 23, 2017. Permitting regulatory agencies were invited to the meeting. The purpose of this meeting was to present the Proposed Project background, objectives, schedule, and status to the regulatory agencies. The goal was to achieve early alignment and solicit agency input on slope stabilization design options that would address both the roadway stability

issues and the need to reduce impacts to fishery resources in Redwood Creek. The following resource agencies were invited to provide scoping input and attend this meeting:

- CDFW
- San Francisco Bay RWQCB
- CDPR
- Marin County
- NMFS
- NPS
- USACE
- USFWS

The meeting was attended by representatives from Marin County, FHWA-CFLHD, NPS, CDPR, USFWS, RWQCB, and CDFW. The following summarizes the agency input received during the scoping process:

- USFWS noted that breeding sites for the federally listed California red-legged frog (CRLF) (*Rana draytonii*) are known to occur within 2 miles of the Proposed Project area; therefore, they are likely to be present and using the habitat adjacent to the roadway. The foothill yellow-legged frog *(Rana boylii)*, may also be present. Foothill yellow-legged frog are not listed at the federal level within Marin County. They are listed as a Species of Special Concern by the State; however, they are not listed under CESA. Additionally, critical habitat for the CRLF and northern spotted owl (NSO) (*Strix occidentalis caurina*) does not occur within the Proposed Project area.
- RWQCB indicated that the area is not likely providing rearing habitat for the coho salmon (*Oncorhynchus kisutch*) as previously thought. However, the area contains riparian habitat that will need to be evaluated and mitigated as needed.
- CDFW voiced concerns about impacts to fish passage and constrictions of the creek channel.

2. Public Meetings

A total of three public meetings were conducted, the first being the public scoping meeting held on November 9, 2016, described above.

The second public meeting was held on April 18, 2017, and included representatives from Marin County, FHWA-CFLHD, NPS, and CDPR. It was held in an open-house format with a brief presentation. Most comments voiced support for road improvements and the desire to improve safety for bicyclists and pedestrians, with several comments requesting that paved bike lanes be provided. Some suggested ways to minimize the road width, such as using vertical barriers to separate bike lanes or only providing bike lanes in the uphill direction. Some comments supported use of shuttles to reduce the

volume of vehicles on the road. A few comments requested that parking capacity issues be addressed to reduce number of cars that park at the side of the road and encroach on bike and pedestrian areas. It was suggested that large trucks and buses be restricted to using CA1 and the lower/flat section of the road. Another comment suggested that the Proposed Project should protect the steelhead trout *(Oncorhynchus mykiss)* and endangered coho salmon in Redwood Creek and contribute to restoring/improving the creek's water quality by treating stormwater runoff before it is discharged into the creek.

The third public meeting was held on September 13, 2023, and included representatives from Marin County, FHWA-CFLHD, NPS, and CDPR. It was also held in an open-house format with a brief presentation. One comment sheet was submitted at the meeting that suggested installing a potable water pipe from Muir Woods to Muir Beach during construction of the Proposed Project to provide an alternative to pumping water from Redwood Creek, which gets low during droughts and endangers aquatic species. Following the public meeting, Save Our Seashore submitted a comment suggesting a narrower lane width of 10 feet would be appropriate for the Proposed Project given traffic volumes. In response to this input, an updated traffic study was conducted in spring 2024. The updated traffic study indicated that 10-foot lanes would be appropriate for the Proposed Project, as discussed in the Proposed Project section of Chapter II, Section D.1 (Alternatives Evaluated for Impacts in this Draft IS with Proposed MND).

3. Agency Coordination

Meetings held with resource agencies, in addition to the agency scoping meeting discussed in Chapter III, Section A.1 (Scoping), are summarized as follows:

- **RWQCB Field Meeting**: This meeting with RWQCB was held on April 19, 2017, to discuss slope stabilization and to solicit input on avoiding and minimizing impacts to water quality.
- **NMFS Meeting**: This meeting with NPS and NMFS was held on May 14, 2019, to provide an overview of the Proposed Project and to solicit input on avoiding and minimizing impacts to Redwood Creek.
- **Regulatory Agencies Field Meeting**: This multi-agency meeting was held on February 1, 2023, to solicit input on slope and streambank stabilization concepts and to solicit input on avoiding and minimizing impacts to Redwood Creek.
- **Lake and Streambed Alteration Agreement Requirements**: This meeting with CDFW was held on August 10, 2023, to discuss CDFW's perspective on the applicability of a Lake and Streambed Alteration Agreement.
- **NMFS Section 7 Biological Assessment (BA)**: Three meetings were held with NMFS on September 5, 2023, October 24, 2024, and December 4, 2024, to discuss analysis of federally listed species in the BA.

- **USFWS Section 7 BA**: Three meetings were held with USFWS on October 5 and 30, 2023, and November 26, 2024, to discuss analysis of federally listed species in the BA.
- **Design Field Review**: This multi-agency field meeting with Marin County, FHWA-CFLHD, NPS, CDPR, RWQCB, and CDFW was held on August 12, 2025 to review the project design, and in particular how water quality was approached in the design.

Additional details regarding consultation under ESA and CESA can be found in Chapter IV, Section 4 (Biological Resources), and regarding cultural resources in Sections 5 (Cultural Resources) and 18 (Tribal Cultural Resources).

4. Tribal Consultation

Government-to-government consultation with tribes has and will continue to be conducted throughout the environmental review process for the Proposed Project. The Federated Indians of Graton Rancheria and the Ione Band of Miwok Indians were notified of the public meetings for the Proposed Project described previously. Additionally, Marin County sent letters to the Tribes in March 2021. The letters notified the Tribes of the Proposed Project and included a description and map of the Proposed Project. In their letters, Marin County provided the Tribes with an extended response timeframe of 60 days "due to the situation with Covid-19," the viral pandemic occurring at the time.

The Ione Band of Miwok Indians did not respond. The Federated Indians of Graton Rancheria responded in April 2021 with a formal request for tribal consultation and outlined topics to be included in the consultation. These topics included results of record searches and surveys, Proposed Project alternatives, mitigation measures, significance of tribal resources, and the significance of the Proposed Project's impacts to tribal cultural resources. Marin County and FHWA-CFLHD provided this information and coordinated with the Federated Indians of Graton Rancheria to arrange for a tribal monitor to be present during the archaeological testing that was conducted for the Proposed Project. The findings and results of file searches and field surveys were provided to the Tribe for review and input. Additionally, a consultation meeting was also held on March 15, 2023, to discuss the Federated Indians of Graton Rancheria's comments on the draft Cultural Resources Assessment. A project update letter was sent to the Federated Indians of Graton Rancheria on December 9, 2025. Confirmation of receipt of letter was received, and no concerns or comments were provided. A copy of this Draft IS with Proposed MND will be provided to the tribe for review during the public comment period.

5. IS Review

This Draft IS with Proposed MND has been developed to meet Marin County's obligations as the lead agency under CEQA. Copies of this Draft IS with Proposed MND

and associated technical reports are available for review at the Marin County Department of Public Works, 3501 Civic Center Drive, Suite 404, San Rafael, California 94903, Monday-Friday, 8:00 a.m. to 5:00 p.m. and through the Marin County Planning webpage at https://www.marincounty.gov/departments/cda/planning/environmental-planning/current-ceqa-projects/muir-woods-road-improvement-project.

Comments on this Muir Woods Road Improvement Project IS may be provided in the following ways:

- Mailed to Marin County, Attention: Rachel Calvert, 3501 Civic Center Drive, Room 304, San Rafael, CA 94903
- Emailed to envplanning@marincounty.gov

Comments can only be accepted using the methods listed above. Before including a personal address, phone number, email address, or other personal identifying information in written comments, anyone providing written comment should be aware that their entire comment—including their personal identifying information—may be made publicly available at any time.

The Draft IS with Proposed MND and EA are being released for public review concurrently. After comments on the Draft IS with Proposed MND are received—from the public, reviewing agencies and tribes—Marin County, in cooperation with FHWA-CFLHD, will respond to CEQA comments, will prepare the Final IS/MND under CEQA, and may (1) certify the Final IS/MND, (2) conduct additional environmental studies, or (3) not proceed with the Proposed Project. If the Final IS/MND is certified under CEQA and all of the required federal and state permits or agreements are obtained, the Proposed Project may proceed to final design and construction.

Following public, agency, and tribal review of this Draft IS with Proposed MND, Marin County, in coordination with FHWA-CFLHD, will update the environmental analysis, if necessary, in response to comments received during the 30-day public review. Mitigation measures may be replaced with equal or more effective measures in accordance with Section 15074.1 of the State CEQA Guidelines before project approval. If the impacts of the Proposed Project remain less than significant, Marin County will conclude the CEQA process with adoption of an MND. The environmental analyses and impact calculations contained in the Draft IS with Proposed MND are based on the preliminary design.

This Draft IS with Proposed MND is being circulated to all agencies that have jurisdiction over the Proposed Project corridor or the resources impacted by the Proposed Project. The goal of the review is to attest to the completeness and adequacy of the information contained in this Draft IS with Proposed MND as it relates to the concerns that are germane to the agency's jurisdictional authority.

Marin County:

- Marin County Department of Public Works
- Marin County Community Development Agency
- Marin County Fire Department

Trustee and Responsible Agencies:

- National Marine Fisheries Services
- U.S. Department of Fish and Wildlife
- U.S. Army Corp of Engineers
- California Department of Fish and Wildlife
- San Francisco Bay Regional Water Quality Control Board

Tribes:

- Federated Indians of Graton Rancheria
- Ione Band of Miwok Indians

IV. Evaluation of Environmental Impacts and Mitigation Measures

Pursuant to Section 15063 of the 2025 State CEQA Guidelines and the County EIR Guidelines, Marin County prepares an IS for all projects not categorically exempt from the requirements of CEQA. The IS evaluation is a preliminary analysis of a project that provides the County with information to use as the basis for deciding whether to prepare an EIR or Negative Declaration. The points enumerated in this section describe the primary procedural steps undertaken by the County in completing an IS checklist evaluation and, in particular, the manner in which significant environmental impacts of the Proposed Project are identified and recorded.

A. The determination of significant environmental effect is to be based on substantial evidence contained in the administrative record and the County's environmental database consisting of factual information regarding environmental resources and environmental goals and policies relevant to Marin County. As a procedural device for reducing the size of the IS, relevant information sources cited and discussed in topical sections of the checklist evaluation are incorporated by reference into the checklist (e.g., general plans, zoning ordinances). Each of these information sources is provided in Chapter VI (Documents Incorporated By Reference). Other sources used or individuals contacted may also be cited in the discussion of topical issues where appropriate.

B. In general, a Negative Declaration will be prepared for a project subject to CEQA when either the IS demonstrates that there is no substantial evidence that the project may have one or more significant effects on the environment. A Negative

Declaration will also be prepared if the IS identifies potentially significant effects, but revisions to the project made by or agreed to by the applicant prior to release of the Negative Declaration for public review would avoid or reduce such effects to a level of less than significance, and there is no substantial evidence before Marin County that the project as revised will have a significant effect on the environment. A signature block is provided in Chapter V (Proposed Determination) of this IS to verify that the project sponsor has agreed to incorporate mitigation measures into the Proposed Project in conformance with this requirement.

C. All answers to the topical questions take into account the whole of the action involved, including off site as well as on site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts. Significant unavoidable cumulative impacts are identified in Section 21.1 (Mandatory Findings of Significance – Impact Analysis) of this IS.

D. A brief explanation is given for all answers and are adequately supported by the information sources Marin County cited in the parenthesis following each question.

E. "Less Than Significant Impact" is appropriate if an effect is found to be less than significant based on the project as proposed and without the incorporation of mitigation measures recommended in the IS.

F. "Less Than Significant Impact With Mitigation Incorporated" applies where the incorporation of recommended mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less than Significant Impact." Marin County has described the mitigation measures and briefly explained how they reduce the effect to a less than significant level (mitigation measures from Section IV [Evaluation of Environmental Impacts and Mitigation Measures] may be cross-referenced).

G. "Potentially Significant Impact" is appropriate if an effect is significant or potentially significant, or if Marin County lacks information to make a finding that the effect is less than significant. If there are one or more effects which have been determined to be significant and unavoidable, an EIR will be required for the project.

H. The answers in this checklist have also considered the 2025 State CEQA Guidelines and questions from the checklist in Appendix G to the 2025 State CEQA Guidelines.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors marked with a "Yes" in the following list would be potentially affected by this project, involving at least one impact that is "Less Than Significant Impact with Mitigation Incorporated".

Environmental Factor	**Yes or No**
Aesthetics	No
Agriculture and Forestry Resources	Yes
Air Quality	No
Biological Resources	Yes
Cultural Resources	No
Energy	No
Geology and Soils	No
Greenhouse Gas Emissions	No
Hazards and Hazardous Materials	No
Hydrology and Water Quality	No
Land Use and Planning	No
Mineral Resources	No
Noise	No
Population and Housing	No
Public Services	No
Recreation	No
Transportation	No
Tribal Cultural Resources	No
Utilities and Service Systems	No
Wildfire	No
Mandatory Findings of Significance	Yes

ENVIRONMENTAL IMPACT CHECKLIST

1 AESTHETICS

Except as provided in *California Public Resources Code* (PRC) Section 21099, would the Proposed Project:

Question	CEQA Determination
a) Have a substantial adverse effect on a scenic vista?	No Impact
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	Less than Significant Impact
c) In nonurbanized 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 a publicly accessible vantage point). If the Proposed Project is in an urbanized area, would the Proposed Project conflict with applicable zoning and other regulations governing scenic quality?	Less than Significant Impact
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	Less than Significant Impact

1.1 Methodology

This analysis was prepared to identify visual impacts that could result from the Proposed Project by identifying visual resources in the Proposed Project area, identifying viewer groups and viewer sensitivity, assessing the amount of visual change that would occur as a result of the Proposed Project, and predicting how viewers would perceive and respond to those changes.

1.2 Environmental Setting

Muir Woods Road has no federal or state designation as a scenic road, and no scenic vistas have been formally designated along the road. Muir Woods Road and the surrounding areas are known for their natural beauty. Scenic areas near the area of visual effects (AVE) include the Pacific Ocean, Golden Gate Bridge, beaches, cliffs, coastal chaparral, low mountains, swaths of prairie, live oak woodlands, salt marshes, freshwater wetlands and creeks, and redwood forests (GGNRA 2019). A portion of MWNM and GGNRA fall within the AVE. MWNM, which is known for its wild natural beauty, and GGNRA both contain many scenic resources.

Most of the AVE lies within the Mount Tamalpais State Park, with small portions in GGNRA at the southern end of the Proposed Project and MWNM at the northern end. The visual character of the AVE consists of densely vegetated hills and ravines.

In some portions of the Muir Woods Road corridor, the steep and wooded hillsides constrain views from the road to the foreground (Photo 6). The road travels through a ravine that widens in some areas and provides roadway travelers with views of surrounding vegetated hillsides and open sky, especially in the southern portion of the AVE where the tree cover is less dense (Photo 7). In some areas, short grassy vegetation is visible at the roadway edge and then transitions to shrubs and tall deciduous and coniferous trees farther from the road (Photo 6). Other areas along the corridor, especially in the northern part of the AVE, provide intermittent views of cut slopes and trails at the roadway edge (Photo 8). Roadway travelers experience views of sparse residential development in the southern portion of the AVE near the Muir Beach community. Views of power poles and power lines are common along the length of Muir Woods Road (Photo 7).

Other visual elements in the AVE include the following:

- Paved Muir Woods Road itself
- Vehicles traveling on the road
- Bicyclists, pedestrians, and equestrians
- Small roadside pull-out areas
- Intermittent views of Redwood Creek
- Vehicles parked intermittently along the roadway edge
- Parking lots with parked vehicles in the northern part of the AVE, near the MWNM visitor center
- Short segments of wood fencing and roadway concrete barriers, as well as bollards approximately 2 feet high that line the outside edge of the road
- Signage

Three bridges are in the AVE—one bridge over Kent Creek in the central portion of the Proposed Project area and two bridges that cross Redwood Creek in the northern and southern portions of the AVE. The Kent Creek and southern Redwood Creek bridges are not visually obvious to road travelers because they are marked only by gray metal guardrails on both sides of the road. The northern Redwood Creek bridge is more visually noticeable because its gray concrete railings and portions of the gray concrete bridge structure can be seen from the road as the road curves at the southern approach to the bridge. Photo 7 shows Redwood Creek and northern bridge, as viewed down near the creek.

The AVE has limited nighttime light sources. No streetlights are located along Muir Woods Road, and the sparse residential land uses in the southern portion of the AVE generate minor levels of nighttime lighting.

Photo 6. Muir Woods Road near MWNM



Photo 7. Redwood Creek bridge and habitat along Redwood Creek



Photo 8. A winding section of Muir Woods Road with background habitat



Photo 9. Muir Woods Road with views typical of southern AVE



While many scenic resources can be found in the general vicinity of the AVE, such as forested areas, thick vegetation, creeks, and hillsides, no scenic vistas have been formally designated along Muir Woods Road. The road is at the bottom of a ravine, and the dense vegetation and hills restrict distant views.

The Caltrans State Scenic Highway Mapping System (Caltrans n.d.) indicates that no designated state scenic highways are within the AVE or within MWNM. However, CA-1, which intersects Muir Woods Road at the southern end of the AVE, is an Eligible State Scenic Highway—Not Officially Designated. CA-1 is also known as Shoreline Highway in this area.

Viewer groups in the Proposed Project area include road travelers; visitors/sightseers; recreationists, including hikers, bicyclists, and equestrians; park staff; and residents.

1.3 Regulatory Setting

This section provides an overview of federal, state, and local aesthetic regulations.

1.3.1 Federal

There is one federal regulation that is applicable to the Proposed Project related to aesthetics, which is discussed in the following subsection.

1.3.1.1 Coastal Zone Management Act of 1972

California participates in the federal Coastal Zone Management Program established under the CZMA. The goal of the CZMA is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." California enacted the California Coastal Act (CCA) of 1976, that protects the coastline, which is implemented and overseen by the CCC. The CZMA and CCA have similar policies for the protection and expansion of public access and recreation; the protection, enhancement, and restoration of environmentally sensitive areas; protection of agricultural lands; and the protection of scenic beauty.

1.3.2 State

There is one state regulation that is applicable to the Proposed Project related to aesthetics, which is discussed in the following subsection.

1.3.2.1 PRC Section 21001(b)

PRC Section 21001[b] states that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities".

1.3.3 Local

There are two local regulations that are applicable to the Proposed Project related to aesthetics, which are discussed in the following subsections.

1.3.3.1 Marin Countywide Plan 2007-2020

The *Marin Countywide Plan* 2007-2020 (Marin County 2007) contains numerous goals and policies for the built environment related to preserving and enhancing scenic resources. It includes policies to protect ridgelines, hillsides, and open space, as well as visual resources such as historic landmarks, scenic vistas, and natural features. While these built environment policies apply more specifically to community development than to roadways, they reflect the importance that Marin County residents place on protecting and preserving scenic resources, such as views of ridgelines and upland greenbelts, hillsides, water, and trees.

1.3.3.2 Marin County Local Coastal Program

As required under the CCA, Marin County developed a Local Coastal Program (LCP) (Marin County 1979) to ensure that local government development plans, policies, and ordinances conform to CCA policies. The Marin County LCP notes that the CCA visual quality policies require the protection of scenic and visual resources of coastal areas. Visual resources, including wetlands and other natural features as well as human-made features, are vulnerable to degradation through improper location of development; alteration of natural landforms by poor cutting, grading, and filling practices; and by poor design or placement of roadside signs and utility lines. A primary concern of the CCA is to protect views to scenic resources from public roads, trails, and vista points.

Approximately 725 feet of the Proposed Project at its southern terminus is within the Marin County Coastal Zone boundary, and it falls within both federal jurisdiction (GGNRA) and state jurisdiction (Mount Tamalpais State Park). While federal lands are excluded from the coastal zone, federal projects that have reasonably foreseeable effects on state coastal zones should be evaluated for consistency with the CCA.

1.4 Impact Analysis

The assessment of visual impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Have a substantial adverse effect on a scenic vista?

No formally designated scenic vistas are present within the AVE. Viewer groups do not experience expansive distant views within the AVE because the tall dense vegetation and hills largely constrain views to the roadway corridor itself. Therefore, construction and operation of the Proposed Project would have no impact.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No designated state scenic highways or officially designated scenic resources are within the AVE (Caltrans n.d.). CA-1 is an Eligible State Scenic Highway—Not Officially Designated, and intersects Muir Woods Road at the southern end of the AVE. The area of slope repair closest to CA-1 would be approximately 1,200 feet from CA-1, which would not be visible from CA-1. Pavement rehabilitation activities would not encroach on the Caltrans CA-1 ROW. Muir Woods Road would maintain its current alignment where it intersects CA-1. Most tree impacts would occur at the bridge replacement site at the north end of the AVE, over 2 miles from CA-1. The Proposed Project would not damage any scenic resources including, but not limited to, rock outcroppings, and historic buildings within a state scenic highway. Construction and operation of the Proposed Project would have a less than significant impact.

c) In nonurbanized 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). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The Proposed Project would result in visual changes caused by road widening and associated vegetation removal and ground disturbance. Removal of trees and other vegetation and exposed soil that would result from the Redwood Creek bridge replacement and road realignment would temporarily diminish the visual quality of that area during construction, specifically MWNM, within which these activities would occur.

Based on the preliminary design, the following features of the new bridge and realignment of the approach road would permanently make the presence of the bridge more visually obvious to viewers during operation than the existing bridge, but the scale and character of the new bridge would be consistent with the visual setting of the AVE.

- The new bridge would be longer than the existing bridge (100 feet long compared to the 21.5-foot-long existing bridge).
- The bridge deck would be approximately 2 feet higher than the existing bridge to provide adequate clearance above the creek's 100-year water surface elevation.
- Both sides of the bridge would include 1.75-foot-tall concrete barriers and pedestrian/bicycle railings, for a total railing height of 4.5 feet.
- A sidewalk would be provided on the upstream (north) side of the bridge.
- The roadway approaches to the new bridge would be straighter, allowing for more open views of the features of the new bridge (such as railings) compared to existing conditions, making the presence of the bridge more apparent.

The Proposed Project would result in temporary visual changes within the AVE during construction by introducing views of equipment and workers, traffic, dust, staging, and signage. Small staging areas may be used and shifted along the corridor as road work is completed, as determined by the contractor. Workers, materials, and equipment at the staging areas would introduce visual changes at those areas. These changes would impact public views experienced by park staff, visitors, recreationists (hikers, bicyclists, horseback riders), and residents who travel within the AVE. These viewers would experience visual impacts where vegetation would be removed for road widening. These changes would diminish the visual quality of public views at those locations. The area of highest visual change would occur in the north part of the AVE where the Redwood Creek bridge and its approach roads would be removed, and the new bridge and realigned road would be built.

The existing bridge and the abandoned portion of the existing road would be removed, resulting in views of exposed soil. Implementing AMM BIO-1 and AMM AES-1 would avoid and/or minimize these impacts. As discussed in Section 11.4 (Land Use and Planning – Impact Analysis), the Proposed Project would not conflict with applicable zoning and other regulations governing scenic quality in the area. The Proposed Project would not temporarily or permanently impact the existing visual quality of public viewpoints outside of the AVE, such as the Muir Beach Overlook, during construction or operation. Construction and operation of the Proposed Project would have a less than significant impact.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The AVE has limited sources of nighttime lighting. No lighting associated with the roadway is present along Muir Woods Road or on bridges. Existing sources of nighttime light are largely limited to the intermittent residential land uses along Muir Woods Road. No new lighting would be included in the Proposed Project. The design of the new bridge includes a finish texture that would consist of concrete surfaces with weathering steel girders, both of which would have non-glare surfaces. Use of an aesthetic form liner or concrete colorization on the bridge barriers may be considered during the final design process, all of which would employ non-glare finishes.

Construction work is planned to occur during daylight hours. Nighttime construction would not be required. Light sources could temporarily impact viewers that may be traveling through the AVE and residents adjacent to or within view of construction areas, including residents on Camino del Canyon and Conlon Avenue at nighttime. Security lighting at sites may also result in nighttime light impacts to viewers in the vicinity of construction. With implementation of AMM BIO-35, these visual impacts would be avoided and/or minimized, and viewer response is expected to be neutral. Therefore, security lighting temporarily used during construction would result in a less than significant impact.

The Proposed Project would not create a permanent source of substantial light or glare within the AVE during operation. Operation of the Proposed Project would have no impact.

1.5 Avoidance and/or Minimization Measures

Avoidance and/or minimization measures (AMM) are measures taken to either avoid an impact by not taking a certain action or by reducing the degree or magnitude of a project's impact by implementing proposed standards and/or best management practices (BMPs). The following avoidance and/or minimization measures would be implemented to avoid and/or minimize impacts on aesthetic resources:

- **AMM AES-1**: The Proposed Project would avoid, to the extent practicable, damage to or removal of vegetation including trees and shrubs to the maximum extent feasible. Trees and existing vegetation would be protected outside of the clearing and grubbing limits from the contractor 's operations, equipment, and materials storage. High-visibility temporary fencing would be placed around vegetation to be protected before roadway work begins.

In addition, AMM BIO-1 would be employed to restore temporarily impacted areas to preconstruction conditions, and AMM BIO-35 would be employed to limit construction operations to daylight hours.

1.6 Mitigation Measures

Mitigation measures are actions that make a significant adverse environmental impact less severe, less extensive, or less objectionable. No mitigation is required for aesthetics.

2 AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection (CAL FIRE) regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board (CARB).

Would the Proposed Project:

Question	CEQA Determination
a) 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?	Less than Significant Impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	No Impact
c) 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))?	No Impact
d) Result in the loss of forest land or conversion of forest land to non-forest use?	Less than Significant Impact with Mitigation Incorporated
e) 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?	No Impact

2.1 Methodology

The study area for farmland, agriculture, and forestry resources consists of the construction limits for the Proposed Project, which generally consists of a 50-foot-wide corridor centered on the existing roadway that expands to a 200-foot width where the bridge replacement and road realignment are proposed. Farmland, agriculture, forestry resource, and county zoning data were obtained for the study area from the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) and the

California Department of Conservation (CDC) Farmland Mapping and Monitoring Program, as well as Marin County and the tree survey conducted for this undertaking, as documented in the Biological Resources Report (BRR) prepared for this Proposed Project (Jacobs 2024a).

2.2 Environmental Setting

No prime or unique farmland is present within the study area. The study area contains five soil units, of which only the Blucher-Cole complex soils are identified as farmland of statewide importance (NRCS 2023b). Table 2-1 summarizes the soil units within the study area, excluding the existing 50-foot ROW. As shown, the study area contains approximately 5.80 acres of soil classified as farmland of statewide importance, representing approximately 67.5 percent of study area soils.

Table 2-1. Soil Units within Study Area

Soil Unit	Designation	Acres in Study Area[a]	Percent of Study Area[a]
Blucher-Cole complex, 2% to 5% slopes	Farmland of statewide importance	5.80	67.5%
Bonnydoon gravelly loam, 30% to 75% slopes	Not prime farmland	0.03	0.4%
Centissima-Barnabe complex, 30% to 50% slopes	Not prime farmland	0.36	4.2%
Cronkhite-Barnabe complex, 30% to 50% slopes	Not prime farmland	1.50	17.5%
Dipsea-Barnabe very gravelly loams, 50% to 75% slopes	Not prime farmland	0.89	10.4%
Total in Study Area	Not applicable	**8.59**	**100.0%**

Source: NRCS 2023b

[a] Excluding existing ROW.

The California Important Farmland Finder (CDC 2022a) classifies the farmland type within the study area as “Other Land.” The CDC notes that this classification is assigned to land that is “not included in any other mapping category.” The Other Land classification includes “[v]acant and non-agricultural land surrounded on all sides by urban development and greater than 40 acres.” Common examples include “low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than forty acres.”

The CDC California Williamson Act Enrollment 2022 map indicates that no Williamson Act contract land is present within the study area (CDC 2022b). Land within the study

area is zoned as Open Area (OA) (Marin County 2023c). The OA zoning is intended for areas within Marin County that are committed to open space uses, as well as environmental preservation (*Marin County Code* Title 22, Development Code). The last approximately 0.1 mile of the southern end of the study area is also within the coastal zone.

Much of the study area is densely forested, although the density of trees diminishes as a traveler moves farther south on the corridor. A tree survey was conducted where the Redwood Creek bridge would be removed and replaced, and the bridge roadway approaches would be realigned. The tree survey is documented in the BRR (Jacobs 2024a). The tree survey identified ten tree species, seven of which are California native species. Red alder (*Alnus rubra)* (27 trees) was the most abundant, followed by California bay (*Umbellularia californica*) (18 trees) and California buckeye (*Aesculus californica*) (17 trees). The red alders were concentrated around Redwood Creek. Other tree species included arroyo willow (*Salix lasiolepis*), big-leaf maple (*Acer macrophyllum*), coast live oak (*Quercus agrifolia)*, Douglas-fir (*Pseudotsuga menziesii)*, apple (*Malus* sp.), pear (*Pyrus* sp.), and plum (*Prunus* sp.).

2.3 Regulatory Setting

This section provides an overview of federal, state, and local agriculture and forestry resource regulations.

2.3.1 Federal

There is one federal regulation that is applicable to the Proposed Project related to agriculture and forestry resources, which is discussed in the following subsection.

2.3.1.1 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is designed to protect farmland by minimizing the impact of federal programs on the conversion of agricultural land to non-agricultural uses. It ensures that federal agencies consider the effects of their actions on farmland and work in conjunction with state and local policies aimed at farmland preservation.

The FPPA includes construction within an existing ROW purchased on or before August 4, 1984. The 50-foot-wide road ROW was granted to Marin County in 1939 (Jacobs 2024d). As such, the FPPA does not apply to construction within the existing ROW. Therefore, study area farmland was calculated by subtracting the existing 50-foot ROW owned by Marin County from the total farmland identified within the study area.

2.3.2 State

There are three state regulations that are applicable to the Proposed Project related to agriculture and forestry resources, which are discussed in the following subsections.

2.3.2.1 California Legacy Program Act of 2007

The California Legacy Program Act of 2007 provides for the acquisition and management of private forest lands for long-term conservation.

2.3.2.2 Williamson Act

The California Land Conservation Act, also known as the Williamson Act, allows local governments to contract private landowners to restrict specific parcels of land to agricultural or related open space use. In return, landowners receive lower property tax assessments (CDC 2023a). The Williamson Act Program "protects agricultural and open space land from premature and unnecessary urban development" (CDC 2023a).

2.3.2.3 PRC Sections 12220(g)

PRC Section 12220(g) defines forest land 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."

2.3.3 Local

There are no local regulations that are applicable to the Proposed Project area related to agriculture and forestry resources.

2.4 Impact Analysis

The assessment of impacts to agricultural and forestry resources is provided in the responses to the following questions.

Would the Proposed Project:

a) 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?

The study area contains approximately 5.80 acres of soil classified as farmland of statewide importance, representing approximately 67.5 percent of study area soils (Table 2-1). While most activities during construction would occur within the existing roadway bench within the existing 50-foot-wide ROW, some areas of proposed slope stabilization would extend outside this ROW. Where existing culverts extend outside the

Marin County ROW, permanent easements would be required at culvert inlets and outlets, slope stabilization areas, and approach roads to accommodate construction and operation. Permanent ROW acquisition would be required for the bridge replacement and roadway realignment. These permanent easements and ROW acquisitions would require approximately 1.8 acres of the 5.8 acres of farmland of statewide importance in the study area. No agricultural uses occur in these areas. The NRCS Farmland Conversion Impact Rating for Corridor Type Projects Form (form NRCS-CPA-106) (NRCS 2023a) was completed to determine exemption status from the FPPA. The form indicates a project score below the 160-point threshold required for alternative site consideration; therefore, the Proposed Project is exempt from the FPPA.

The Proposed Project would not convert prime farmland, unique farmland, or farmland of statewide importance to a non-agricultural use. Construction and operation of the Proposed Project would have a less than significant impact.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Williamson Act contract land is present within the study area, and no land within the study area is zoned for agricultural use. Construction and operation of the Proposed Project would have no impact.

c) 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))?

Portions of the study area meet the definition of forest land per PRC Section 12220(g) and timberland per PRC Section 4526. As discussed in Section 11.2 (Land Use and Planning – Environmental Setting), all land within the study area is zoned OA (Marin County 2023c), with part of the southern portion of the study area zoned coastal OA. The OA zoning is intended for areas within Marin County that are committed to open space uses, as well as environmental preservation (*Marin County Code* Title 22, Development Code). Land adjacent to the roadway corridor is in federal and state ownership. No land within the study area is zoned for timberland production. Construction and operation of the Proposed Project would have no impact to timberland.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

Forested areas within the study area, particularly close to MWNM, meet the PRC Section 12220(g) definition of forest land. Replacing the bridge over Redwood Creek and realigning the road would require clearing and grubbing of trees and would therefore result in the loss of such forest land due to the conversion of forest land to non-forest use. Based on the preliminary design, it is estimated that a total of approximately 2.2 acres of woodlands (0.3 acre of Douglas-fir/coast redwood and

1.9 acres of hardwood forest) would be permanently impacted, and a total of approximately 1.7 acres of woodlands (0.2 acre of Douglas-fir/coast redwood forest and 1.5 acres of hardwood forest) would be temporarily impacted. With implementation of MM BIO-4, construction and operation of the Proposed Project would have a less than significant impact.

e) 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?

The Proposed Project would not involve other changes in the existing environment to those described in the responses to the previous questions that would result in the conversion of farmland or forest land. Construction and operation of the Proposed Project would have no impact.

2.5 Avoidance and/or Minimization Measures

Refer to AMM BIO-1 in Section 4.5 (Biological Resources – Avoidance and/or Minimization Measures), which would restore areas to preconstruction conditions through planting and seeding with native species, to avoid and/or minimize impacts to agriculture and forestry resources.

2.6 Mitigation Measures

Refer to MM BIO- in Section 4.6 (Biological Resources – Mitigation Measures), which will mitigate impacts to forestry resources from tree removal to a less than significant level.

3 AIR QUALITY

Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations.

Would the Proposed Project:

Question	CEQA Determination
a) Conflict with or obstruct implementation of the applicable air quality plan?	Less than Significant Impact
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Proposed Project region is non-attainment under an applicable federal or state ambient air quality standard?	Less than Significant Impact
c) Expose sensitive receptors to substantial pollutant concentrations?	Less than Significant Impact
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Less than Significant Impact

3.1 Methodology

Air quality analyses were conducted using methodology and assumptions that are consistent with the requirements of CEQA, the California Clean Air Act 1988, and the federal Clean Air Act Amendments of 1990.

Emissions were calculated for construction of the Proposed Project using the California Emissions Estimator Model (CalEEMod, Version 2022.1). The model estimates emissions from vehicle trips include material hauling (on-road heavy-duty vehicle trips) and worker commute trips, fugitive dust (PM_{10} and $PM_{2.5}$[1]), and off-road equipment.

Activities are anticipated to occur over a 2-year period beginning in 2027 (two 7-month seasons). Emissions were calculated for each phase of the Proposed Project: 1) grubbing/land clearing, 2) grading/excavation, 3) drainage/utilities/subgrade, and 4) paving. Inputs to the model included schedule, area of disturbance, and type of onsite equipment. Information was provided by the engineering design team. Emissions were estimated using roadway lengths, areas to be disturbed, volume of materials to be imported and exported, and anticipated duration. Default settings of CalEEMod were used when information was not available.

[1] Particulate matter less than 10 microns and 2.5 microns in diameter.

3.2 Environmental Setting

This section summarizes the existing air quality conditions of the Proposed Project area.

3.2.1 Land Uses and Sensitive Receptors

The Proposed Project is in a rural area within Marin County. Sensitive receptors closest to the Proposed Project include residential properties associated with the Muir Beach community adjacent to the southern terminus of the Proposed Project at the Muir Woods Road/CA-1 intersection, residences at Kerri Lane, and residences on Camino del Canyon near the northern terminus. There are no schools or hospitals within 1 mile of the Proposed Project.

3.2.2 Attainment Status and Air Quality Plans

The Proposed Project is in Marin County and within the San Francisco Bay Area Air Basin (SFBAAB) area that is currently designated as a nonattainment area for the ozone federal and state standards, the annual and 24-hour state PM_{10} standards, and the annual and 24-hour $PM_{2.5}$ federal and state standards, and attainment for all other criteria pollutants (Air District 2023).

The most recent air quality plan adopted by the Bay Area Air District (Air District), the *Bay Area 2017 Clean Air Plan: Spare the Air, Cool the Climate* (Air District 2017a), is the applicable air quality plan for projects in Marin County. The Air District adopted the 2017 Clean Air Plan on April 19, 2017.

3.2.3 Climate Conditions

The SFBAAB area is characterized by a variety of terrain features consisting of coastal mountain ranges, inland valleys, and bays that can affect wind flow patterns compared to a more consistent or flat terrain. The Coastal Range splits, resulting in a western coast gap (Golden Gate) and an eastern coast gap (Carquinez Strait), which allows air to flow in and out of the SFBAAB and the Central Valley (Air District 2017b).

In the summer, the West Coast is dominated by a semi-permanent high-pressure cell centered over the northeastern Pacific Ocean. Storms rarely affect the California coast because of the persistence of this high-pressure cell. Thus, conditions that exist during the summer along the California coast consist of a northwest air flow and negligible precipitation.

In the winter, the Pacific high pressure weakens and shifts southward, resulting in more frequent storms. The SFBAAB experiences over 75 percent of the annual rainfall between November and April. During the winter rainy periods, inversions are strong while winds are light, resulting in high potential for air pollution.

3.3 Regulatory Setting

This section provides an overview of federal, state, and local air quality regulations.

3.3.1 Federal

There is one federal regulation that is applicable to the Proposed Project related to air quality, which is discussed in the following subsection.

3.3.1.1 Clean Air Act

The federal Clean Air Act (CAA), as amended, is the primary federal law that governs air quality. The CAA established standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide, ozone, sulfur dioxide, and particulate matter (PM), which is broken down for regulatory purposes into PM_{10} and $PM_{2.5}$. In addition, national and state standards exist for lead, and state standards exist for visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (TACs); some criteria pollutants are also TACs or may include certain TACs in their general definition.

The transportation conformity requirement is based on CAA Section 176(c), which prohibits the U.S. Department of Transportation (DOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to a state implementation plan for attaining the NAAQS. Transportation conformity applies to highway and transit projects and takes place on two levels: the regional—or planning and programming level—and the project level. The Proposed Project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and maintenance (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. The U.S. Environmental Protection Agency (EPA) regulations at *Code of Federal Regulations (*CFR) 40 Part 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

3.3.2 State

There are two state regulations that are applicable to the Proposed Project related to air quality, which are discussed in the following subsections.

3.3.2.1 California Clean Air Act

The California Clean Air Act is the primary state law that governs air quality. This law and related regulations by the CARB set standards for the concentration of pollutants in the air. State ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: CO, nitrogen dioxide, ozone, sulfur dioxide, and PM, which is broken down for regulatory purposes into PM_{10} and $PM_{2.5}$. State standards exist for lead, visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. State standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. State regulations also cover TACs; some criteria pollutants are also TACs or may include certain TACs in their general definition.

3.3.2.2 Air District CEQA Air Quality Guidelines

Guidance for the determination of significant air impacts within Marin County is found in the document titled *CEQA: Air Quality Guidelines* prepared by the Air District (2022). These guidelines assist local agencies in evaluating air quality impacts of the Proposed Project consistent with CEQA requirements.

3.3.3 Local

There are three local regulations that are applicable to the Proposed Project related to air quality, which are discussed in the following subsections.

3.3.3.1 CARB and Air District

The EPA has delegated responsibility to air districts to establish local rules to protect air quality. The air quality management agencies in Marin County include the CARB and the Air District, which are responsible for ensuring that federal and state standards are met.

The Air District implements strategies for air quality improvement and recommends mitigation measures for new growth and development. At the local level, air quality is managed through land use and development planning practices, which are implemented in Marin County through the general planning process.

The Air District is also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. The Air District rules that are applicable to the construction of the Proposed Project include Rule 6-1: Particulate Matter – General Requirements and Rule 6-6: Particulate Matter – Prohibition of Trackout. These rules set requirements for controlling and mitigating fugitive dust emissions from dust-generating activities and operations. Fugitive dust is PM that becomes airborne and has the potential to impact human health or the environment. The most common forms of PM are PM_{10} and $PM_{2.5}$. Fugitive dust from

the Proposed Project would be temporarily generated from activities during construction such as earth moving, driving on haul roads, and ground disturbance.

3.3.3.2 Marin County Unincorporated Climate Action Plan 2030

The *Marin County Unincorporated Climate Action Plan 2030* (Marin CAP) (Marin County 2020) outlines the County's path toward reducing local greenhouse gas (GHG) emissions and other air pollutants through the year 2030. The Marin CAP was originally adopted in December 2020 and most recently updated in January 2024 and includes goals and strategies to reduce GHG emissions and improve air quality. Other Marin CAP goals and policies are included within their respective sections. The following Low-Carbon Transportation Actions goals and strategies are potentially applicable to the Proposed Project:

Low-Carbon Transportation Actions:

- **LCT-C3 Walking**. Encourage walking as an alternative to vehicle use.
- **LC2-M2 Low-Carbon Fuels**. Continue to use low-carbon fuels such as renewable diesel as a transition fuel in the County's fleet and encourage the County's service providers and joint powers agencies to do the same until vehicles ae replaced with zero-emission vehicles.

3.3.3.3 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policies that apply to the Proposed Project area:

- **AIR-1.1 Coordinate Planning and Evaluation Efforts**. Coordinate air quality planning efforts with local, regional, and state agencies, and evaluate the air quality impacts of proposed plans and development projects.
- **AIR-1.2 Meet Air Quality Standards**. Seek to attain or exceed the more stringent of NAAQS or state ambient air quality standards for each measured pollutant.
- **AIR-2.1 Buffer Emission Sources and Sensitive Land Uses**. Consider potential air pollution and odor impacts from land uses that may emit pollution and/or odors when locating (a) air pollution sources, and (b) residential and other pollution-sensitive land uses in the vicinity of air pollution sources (which may include freeways, manufacturing, extraction, hazardous materials storage, landfill, food processing, wastewater treatment, and other similar uses).
- **AIR-3.1 Institute Transportation Control Measures**. Support a transportation program that reduces vehicle trips, increases ridesharing, and meets or exceeds the Transportation Control Measures recommended by the Air District in the most recent Clean Air Plan to reduce pollutants generated by vehicle use.

- **AIR-4.2 Foster the Absorption of Greenhouse Gases**. Foster and restore forests and other terrestrial ecosystems that offer significant carbon mitigation potential.

3.4 Impact Analysis

An assessment of air quality impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

The Clean Air Plan (Air District 2017a) provides an integrated, multipollutant control strategy to reduce emissions of air pollutants. The Proposed Project would be consistent with the applicable air quality plan if it meets the following criteria:

- Complies with all applicable air quality regulations.
- Is consistent with growth forecasts used in local and regional planning.
- Does not conflict or delay implementation of control measures in the air quality plan.

The Proposed Project would not add capacity and therefore would not permanently increase the number of vehicles or permanently increase the vehicle miles traveled (VMT) in the area. The Proposed Project would not increase emissions during operation.

The 2017 Clean Air Plan identifies control strategies to reduce emissions of criteria pollutants, TACs, and GHGs from stationary and mobile sources in the SFBAAB area. The Proposed Project would comply with applicable Air District rules and regulations such as PM and dust control requirements in Regulation 6.

The estimated emissions for the Proposed Project were compared to the Air District CEQA thresholds of significance to determine whether the Proposed Project would cause temporary air quality impacts during construction. The Air District thresholds of significance for emissions are defined in Chapter 3 of the Air District 2022 CEQA guidelines and summarized in Table 3-1. The Air District recommends that lead agencies consider projects that implement BMPs (rather than a numeric threshold) to have a less than significant impact related to fugitive dust (Air District 2022).

Table 3-1. Air Quality Thresholds of Significance (Project Level) – Criteria Air Pollutants and Precursors (Regional)

Pollutant	Construction-related[a] Average Daily Emissions (lb/day)	Operational Average Daily Emissions (lb/day)	Operational Maximum Annual Emissions (tpy)
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust)	82	15
$PM_{2.5}$	54 (exhaust)	54	10
$PM_{10}/PM_{2.5}$ (fugitive dust)	BMPs[b]	None	None
Local CO	None	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)

Source: Air District 2022

lb/day = pounds per day; NO_X = oxides of nitrogen; ppm = parts per million; ROG = reactive organic gases; tpy = tons per year

The air quality project-level thresholds of significance were adopted by the Air District's Board of Directors on June 2, 2010.

[a] The Air District recommends that for projects that require less than 1 year to complete, lead agencies should annualize impacts over the scope of actual days that peak impacts would occur rather than over the full year. Additionally, for phased projects that result in concurrent construction and operational emissions, construction-related exhaust emissions should be combined with operational emissions for all phases where construction and operations overlap.

[b] $PM_{10}/PM_{2.5}$ (fugitive dust) is also recognized to impact local communities. The Air District strongly recommends implementing all feasible fugitive dust management practices, especially when projects are near sensitive communities, including schools, residential areas, or other sensitive land uses. These measures are detailed in Chapter 5, Section 5.2.2, Construction-Related Criteria Air Pollutant Emissions (Air District 2022).

The Proposed Project would implement BMPs to avoid and/or minimize emissions, and the emissions from construction would be lower than the Air District significance thresholds.

Activities during construction are a source of dust and exhaust emissions that can have potential impacts to air quality and would result in the generation of criteria air pollutants, including CO, sulfur dioxide, PM_{10}, and $PM_{2.5}$. These activities would also result in the generation of precursor emissions such as ROG and NO_X, fugitive dust, and off-gas emissions. Sources of exhaust emissions could include on-road haul trucks, delivery trucks, worker commuter vehicles, and off-road heavy equipment. Sources of fugitive dust emissions (PM_{10} and $PM_{2.5}$ dust) could include soil disturbance, grading, and material hauling. Sources of off-gas emissions could include asphalt paving.

These impacts include emissions resulting from earth moving and using heavy equipment during land clearing, ground excavation, cut-and-fill, paving, and roadway reconstruction. Construction is expected to last no more than 14 months. These impacts would be temporary; permanent impacts are not anticipated. Table 3-2 summarizes the estimated emissions for the Proposed Project associated with construction using CalEEMod and are compared to the Air District thresholds of significance.

Table 3-2. Muir Woods Estimated Construction Emissions and Air District Threshold of Significance

Construction Year	ROG[a]	NO_X [b]	PM_{10} (exhaust) [b]	$PM_{2.5}$ (exhaust) [b]	PM_{10} (fugitive dust) [b]	$PM_{2.5}$ (fugitive dust) [b]	Local CO [b]
2027	1.10	9.76	0.35	0.33	26.50	2.74	14.57
2028	0.37	3.64	0.11	0.11	22.55	2.30	5.67
Threshold	54	54	82	54	BMP	BMP	None
Exceeds Threshold?	No	No	No	No	Not applicable	Not applicable	Not applicable

Source: CalEEMod and Air District 2022

[a] Emissions from ROG are included because they contribute to the formation of ozone.

[b] Average daily emissions are in lb/day

Air District rules and CEQA significance thresholds were developed to ensure that air quality and emission control goals in a state implementation plan and the applicable air quality plans are met. The Proposed Project complies with applicable regulations and rules and has emissions lower than the significance thresholds and would not conflict with the regional air quality plan. The Proposed Project would not conflict with or delay implementing the 2017 Clean Air Plan. Construction and operation of the Proposed Project would have a less than significant impact.

The Proposed Project would not conflict with the *Marin Countywide Plan* (2007) and Marin CAP GHG emissions goals and strategies.

The Proposed Project is a type of project consistent with projects listed in 40 CFR 93.126 and, therefore, is exempt from the requirement to make a project-level conformity determination under the CAA.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Proposed Project region is non-attainment under an applicable federal or state ambient air quality standard?

The Proposed Project is within Marin County, which is designated as a nonattainment area for the federal and state ozone standards for the annual and 24-hour state PM_{10} standard and for the annual and 24-hour $PM_{2.5}$ federal and state standards. An

exceedance of the Air District thresholds of significance would result in a cumulatively considerable net increase.

As shown in Table 3-2, criteria air pollutants and precursors would temporarily increase during construction but would not exceed the Air District thresholds of significance. A cumulatively considerable net increase is not anticipated. Construction and operation of the Proposed Project would have a less than significant impact.

c) Expose sensitive receptors to substantial pollutant concentrations?

The Proposed Project activities would not occur in highly populated areas, and few residences are near the Proposed Project. The residential communities nearest to the Proposed Project would be approximately 0.25 mile from the closest Proposed Project work area. The nearest school is over 1 mile from the closest Proposed Project work area, and the nearest daycare center is over 1.5 miles from the closest Proposed Project work area. Residences and other sensitive receptor locations would have temporary exposure to emissions from activities during construction.

The main pollutant of concern during construction would be diesel PM temporarily emitted from the diesel-powered equipment and vehicles. Long-term human exposure to diesel PM has the potential to cause cancer and non-cancer chronic health impacts. Activities and associated temporary emissions would be restricted to small, relatively unpopulated areas where only a limited amount of equipment would be operating at any one time. As a result, exposure of human receptors to diesel PM would not permanently occur during construction.

Criteria air pollutant emissions from Proposed Project activities would be below the applicable Air District thresholds of significance. The Proposed Project would implement BMPs and emission control measures AMM AIR-1 through AMM AIR-9 as discussed in Section 3.5 (Air Quality – Avoidance and/or Minimization Measures) to control fugitive dust and avoid and/or minimize air pollutant emissions during construction. These measures would reduce the potential for exposure of nearby sensitive receptors to pollutants. The Proposed Project would not temporarily expose sensitive receptors to substantial pollutant concentrations during construction. Construction of the Proposed Project would have a less than significant impact.

The Proposed Project would not permanently increase emissions or expose sensitive receptors to substantial pollutant concentrations during operation. Operation of the Proposed Project would have a less than significant impact.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The Air District does not have a significance threshold for temporary odors resulting from activities during construction. Objectionable odors could be created through using diesel-powered vehicles and equipment. Odors created would be spatially dispersed. Construction and operation of the Proposed Project would have a less than significant impact.

3.5 Avoidance and/or Minimization Measures

The following measures would be implemented to avoid and/or minimize impacts to air quality.

- **AMM AIR-1:** Apply water or dust palliative as required to maintain visibility and eliminate hazardous conditions. (Air District BMP #1).
- **AMM AIR-2:** Mark clearing limits and construct sediment perimeter control measures before ground-disturbing activities. Limit the combined grubbing and grading operations areas to 5 acres of exposed soil at one time. Maintain stabilized exits during construction to avoid and/or minimize tracking of soil onto existing roads.
- **AMM AIR-3:** All haul trucks transporting soil, sand, or other loose material off site would be covered (Air District BMP B-2).
- **AMM AIR-4:** All visible mud or dirt tracked out onto adjacent public roads would be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. (Air District BMP B-3)
- **AMM AIR-5:** All vehicle speeds on unpaved roads would be limited to 15 miles per hour. All roadways, driveways, and sidewalks to be paved would be completed as soon as possible. Building pads would be laid as soon as possible after grading unless seeding or soil binders are used. (Air District BMPs B-4, B-5)
- **AMM AIR-6:** All excavation, grading, and demolition activities would be suspended when average wind speeds exceed 20 miles per hour (Air District BMP B-6).
- **AMM AIR-7:** All trucks and equipment, including their tires, would be washed off prior to leaving the site (Air District BMP B-7).
- **AMM AIR-8:** Publicly visible signs would be posted with the telephone number and name of the person to contact at the lead agency regarding dust complaints. This person would respond and take corrective action within 48 hours. The Air District's General Air Pollution Complaints number would also be visible to ensure compliance with applicable regulations (Air District BMP B-9).
- **AMM AIR-9:** Per the Air District Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing), the contractor would submit a written plan or

notification of intent to the Air District's Enforcement Division and Air Pollution Control Officer prior to commencing demolition of any structures if required.

3.6 Mitigation Measures

Because the Proposed Project would have emissions lower than the CEQA significance thresholds, mitigation measures are not required for air quality.

4 BIOLOGICAL RESOURCES

Would the Proposed Project:

Question	CEQA Determination
a) 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 California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), or National Oceanic and Atmospheric Administration National Marine Fisheries Service?	Less than Significant Impact with Mitigation Incorporated
b) 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?	Less than Significant Impact with Mitigation Incorporated
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, or similar) through direct removal, filling, hydrological interruption, or other means?	Less than Significant Impact
d) 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?	Less than Significant Impact
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	No Impact
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	No impact

4.1 Methodology

The methodologies, environmental setting, and impacts used in this analysis are summarized from the following technical reports prepared for the Proposed Project: *Biological Evaluation Report for Muir Woods Road Project* (Atkins 2019b), *Nesting Bird Survey Report for the Muir Woods Road Project* (Jacobs 2022b), *Aquatic Resources Delineation Report* (Jacobs 2022a), BRR (Jacobs 2024a), USFWS BA (Jacobs 2023), USFWS BA Amendment (Jacobs 2024b), and NMFS BA (Jacobs 2024c).

The study area used for the biological resources analysis varies based on the nature of the resource. For most biological resources, the study area is the construction limits for the Proposed Project. This generally consists of a 50-foot-wide corridor centered on the existing roadway and expands to an approximate 200-foot width where the bridge replacement and road realignment are proposed. Where visual and noise impacts are a concern for special-status bird species, the study area includes an additional 330-foot

buffer from the construction limits. In accordance with the revised *Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California* (USFWS 2020), the study area for NSO also included an additional 0.25-mile buffer around any known activity center with recent observations of a potential breeding pair. For assessing impacts to fish species where water quality is a concern, the study area was extended outside the construction limits to encompass the entire reach of Redwood Creek from the northern terminus of the Proposed Project until Redwood Creek flows beneath CA-1 near the southern terminus of the Proposed Project.

The following resources were reviewed to obtain information on the habitat within the study areas and information on special-status species that may be impacted by the Proposed Project:

- U.S. Geological Survey (USGS) topographic maps
- National Wetland Inventory data (USFWS 2023c)
- National Hydrography Dataset (USGS 2023b)
- U.S. Department of Agriculture NRCS Web Soil Survey (NRCS 2023b)
- California Natural Diversity Database (CNDDB) BIOS species occurrences for the nine USGS 7.5-minute quadrangles (Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Quentin, and San Rafael) which encompass the Proposed Project area (CDFW 2023a)
- CDFW Special Animals List (CDFW 2023b)
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2023c)
- State and Federally Listed Endangered and Threatened Plants of California (CDFW 2023d)
- CDFW CNDDB Species Occurrence Geographic Information System (GIS) Database (CDFW 2022a)
- CDFW NSO GIS Database (CDFW 2022b)
- Agency websites (e.g., USFWS, CDFW)
- Communications with federal resource agency personnel
- USFWS Environmental Conservation Online System (USFWS 2023a)
- USFWS Information for Planning and Conservation (USFWS 2023b)
- NMFS Species Directory (NMFS 2022)
- Electronic Inventory of Rare and Endangered Plants, version 9.5 (CNPS 2023)
- Results from prior field surveys and reports (Atkins 2019b)

As discussed in Section 2 (Agriculture and Forestry Resources), a certified arborist completed a tree survey of the proposed bridge relocation area where the construction limits extend up to a 200-foot width from the existing road in August 2019 (Atkins 2019b). This location was prioritized for a detailed tree survey because it has the highest likelihood of tree effects. All trees 4 inches or greater diameter at breast height (DBH) were surveyed. The results of this survey are discussed in detail in the BRR (Jacobs 2024a). In July 2020 and November 2021, biologists completed field surveys within the construction limits of the Proposed Project to assess general habitat conditions and performed aquatic resources delineations. The delineations (Jacobs 2022a) were conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008). Additionally, riparian vegetation was mapped to the outer drip line of trees and shrubs with wetland indicator status of facultative, facultative wetland, or obligate occurring along the banks of natural watercourses. All plant and animal species observed during the surveys were recorded (Jacobs 2024a). Lastly, a nesting bird survey was performed in March 2022 to support vegetation clearing required to facilitate field investigations in the area of the proposed bridge replacement and road realignment (Jacobs 2022b).

4.2 Environmental Setting

4.2.1 General Vegetation Communities and Sensitive Natural Communities

CDFW defines sensitive natural communities as vegetation community types that are rare throughout the state or globally throughout their range. There are no sensitive natural vegetation communities present in the study area (CDFW 2022a).

Table 4-1 summarizes the vegetation communities within the study area. Riparian forest/shrubland is the most prevalent vegetation community in the study area. This vegetation community is one of the most productive wildlife habitats in California, providing food, cover, and water for more than 160 bird species, as well as many mammals, reptiles, and amphibians (CDFW 1988a). This habitat is dispersed throughout the study area along Redwood Creek and its tributaries.

Hardwood forest is concentrated in the northern two-thirds of the study area, with a small area in the southern end of the corridor (CDFW 2005a). This vegetation community corresponds with coastal oak woodland and eucalyptus hardwood forest habitats. The Douglas-fir and coast redwood forest community type occurs at low to moderate elevations and supports a high abundance of wildlife species (CDFW 1988b).

Table 4-1. Summary of Vegetation Communities in the Study Area

Vegetation Community[a,b]	Study Area (acres)
Riparian Forest/Shrubland	61.3
Drier Coastal Grassland/Scrub	45.9
Hardwood Forest (Eucalyptus, Coastal Live Oak, California Bay)	39.1
Dense Coyote Brush Scrub	27.9
Active Pasture	18.8
Douglas-Fir/Coast Redwood	15.5
Disturbance/Urban[c]	11.2
Moist Coastal Grassland	8.0
Totals	**227.7**

[a] Vegetation dataset provided by the CDFW/NPS California Wildlife Habitat Relationships (CWHR) System (2003).

[b] Vegetation impact acreages are based on the preliminary design and may be refined as design progresses.

[c] Refers to areas that have been previously developed, including the existing roadway.

Drier coastal grassland/open scrub and dense coyote brush scrub habitats are dispersed throughout the study area but are more heavily concentrated in the southern half (CDFW 2005b, 1988c). Similarly, moist coastal grassland is interspersed throughout the southern half of the study area. These grassland vegetation types provide habitat for many species, including snakes, birds, bats, deer moles, gophers, mice, and voles (CDFW 2005b).

Active pastures are concentrated near the middle of the study area. This vegetation community often occurs in association with agricultural habitats. These habitats can provide habitat for ground-nesting birds and foraging habitat for mammals. The built-up urban disturbance areas are primarily concentrated in the northern terminus of the study area where numerous parking lots and buildings are present near the entrance to MWNM (CDFW 1988d).

As discussed in Section 2.2 (Agriculture and Forestry Resources – Environmental Setting), a tree survey was conducted where the Redwood Creek bridge would be removed and replaced and the bridge roadway approaches would be realigned. The results of this tree survey are discussed in detail in the BRR (Jacobs 2024a). Table 4-2 summarizes tree species identified within the localized tree survey study area at the proposed bridge replacement and road realignment. Of the 95 trees mapped during the tree survey, 68 were at least 6 inches to 18 inches DBH, and 5 were greater than 18 inches DBH, as listed in Table 4-3.

Table 4-2. Tree Species Present in Study Area

Common Name	Scientific Name	Status	Abundance
Apple	*Malus* sp.	Non-native	4
Arroyo willow	*Salix lasiolepis*	Native	12
Big-leaf maple	*Acer macrophyllum*	Native	3
California bay	*Umbellularia californica*	Native	18
California buckeye	*Aesculus californica*	Native	17
Coast live oak	*Quercus agrifolia*	Native	7
Douglas-fir	*Pseudotsuga menziesii*	Native	1
Pear	*Pyrus* sp.	Non-native	5
Plum	*Prunus* sp.	Non-native	1
Red alder	*Alnus rubra*	Native	27
Total			**95**

Table 4-3. Trees Sizes in the Study Area

Common Name	Tree Size DBH (inches)	Number of Trees	Tree Size DBH (inches)	Number of Heritage Trees
Arroyo willow	6	10	18	0
Big-leaf maple	10	3	30	0
California bay	10	12	30	0
California buckeye	10	12	30	0
Coast live oak	6	6	18	4
Douglas-fir	10	1	30	1
Red alder	10	24	30	0
Total		**68**		**5**

During field surveys, designated noxious weeds were observed (Atkins 2019b). These include Italian thistle (*Carduus pycnocephalus*), oblong spurge (*Euphorbia oblongata*), French broom (*Genista monspessulana*), and periwinkle (*Vinca major*). Of these, two are List B weeds (oblong spurge, periwinkle) and two are List C weeds (French broom, Italian thistle) from the California noxious weeds list (CDFA 2021). Two species recognized by Marin County as species of priority for management, Cape ivy (*Delariea odorata*) and fennel (*Foeniculum vulgare*), also were identified within the study area. Where present along the proposed alignment, all four species of noxious weeds were observed in low density.

4.2.2 Waters of the United States and Waters of the State

The study area is within the Tomales-Drakes Bay Watershed (18050005) hydrologic unit (USGS 2023a). The dominant hydrologic features present within the study area include the perennial Redwood Creek and the intermittent Kent Creek.

A delineation of aquatic features was conducted. Table 4-4 summarizes the types of wetlands and other waters delineated within the study area, which were primarily palustrine emergent wetlands and perennial streams (Redwood Creek) (Jacobs 2022a, 2024a). All waters of the United States are considered waters of the state, but not all waters of the state are considered waters of the United States.

Table 4-4. Waters of the United States/Waters of the State within the Study Area

Aquatic Feature Type	Waters of the U.S. Total Acres	Waters of the State Total Acres
Palustrine emergent wetlands	0.04	0.14
Palustrine scrub-shrub wetlands	0.11	0.11
Wetlands Total	***0.15***	***0.25***
Ephemeral stream	0.00	0.04
Intermittent stream (Kent Creek and unnamed tributary to Redwood Creek)	0.09	0.09
Perennial stream (Redwood Creek)	0.44	0.44
Natural Watercourses Total	***0.53***	***0.57***

4.2.3 Special-Status Species

A total of 76 special-status plant species and 40 special-status animal species are known to occur, or have the potential to occur, within the Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Quentin, and San Rafael 7.5-minute USGS topographic quadrangles (CDFW 2023a). One special-status plant and 16 special-status wildlife species have the potential to occur within the study area. Wildlife species include two invertebrates, three fish, two amphibians, one reptile, five birds, and four mammals. These totals do not include all migratory birds that may inhabit the study area and are only protected by the Migratory Bird Treaty Act.

Table 4-5 summarizes each special-status species with potential to occur within the study area, their habitat requirements, and likelihood of occurrence. The study area contains suitable habitat for all species listed in the table. Many species have multiple special-status designations under state and federal law.

Table 4-5. Special-status Species Summary

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Plant	Minute Pocket Moss *Fissidens pauperculus*	None	Rare, threatened, or endangered in California and elsewhere; fairly threatened in California	Damp coastal soils of North Coast coniferous forest. Found at elevations of 35 to 3,360 feet above mean sea level.	Low. Marginally suitable habitat is present, and a known occurrence overlaps the study area. However, this occurrence is from more than 50 years ago.
Invertebrate	Western Bumble Bee *Bombus occidentalis*	None	State Candidate	Generalist foragers, they do not depend on any one flower type. An important pollinator for various plants in the *Rosaceae*, *Lauraceae*, and *Fabaceae* families.	Moderate. Based on available food plants present, the study area may provide potentially suitable habitat to support this species. There are CNDDB occurrences within a 5 mile radius; however, no occurrences are reported within the study area.

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Invertebrate	Monarch Butterfly *Danaus plexippus*	Proposed Threatened	None	During the breeding season, monarchs lay their eggs on their obligate milkweed host plant (*Asclepias* spp). Monarchs can be found in fields, roadside areas, open areas, or wet areas, where milkweed and other flowering plants are present. Adult monarchs feed on the nectar of many flowers, though breeding is dependent on the presence of milkweed plants.	Low. Two overwintering populations near Muir Beach, one of which is assumed extirpated. No milkweed was observed during field surveys, but study area may provide stop-over habitat during migration.
Fish	Coho Salmon (Central California Coast ESU) *Oncorhynchus kisutch,* pop. 4	Endangered	Endangered	Anadromous species that requires beds of loose, silt-free coarse gravels for spawning. Also needs cover, cool water, and sufficient dissolved oxygen.	High. Species known to occur in Redwood Creek and all accessible reaches of Redwood Creek and Kent Creek are considered habitat, and spawning habitat is present.
Fish	Longfin smelt *Spirinchus thaleichthys*	Candidate	Threatened	Anadromous species found close to shore, in bays and estuaries; ascends coastal streams to spawn.	Moderate. Redwood Creek may provide potentially suitable spawning habitat for this species. There are CNDDB occurrences within 5 miles. However, no occurrences are indicated within the study area.

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Fish	Steelhead (Central California Coast DPS) *Oncorhynchus mykiss*	Threatened	Species of Special Concern	Anadromous species that requires beds of loose, silt-free coarse gravels for spawning. Also needs cover, cool water, and sufficient dissolved oxygen.	High. Species known to occur in Redwood Creek, all accessible reaches of Redwood Creek and Kent Creek are considered habitat, and spawning habitat is present.
Amphibian	California Giant Salamander *Dicamptodon ensatus*	None	Species of Special Concern	Endemic to California. Occurs in wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages. Largely nocturnal, but also active in daylight in wet conditions. Known to occur at elevations from sea level to 3,000 feet above mean sea level.	High. There are known records of this species in and surrounding the study area. Larval and adult stages have been reported within Redwood Creek within the study area.
Amphibian	California Red-legged Frog *Rana draytonii*	Threatened	Species of Special Concern	Endemic to California, species is primarily diurnal. Found active all year except in wetlands that dry out in summer, where frogs will estivate in moist refuges until the late fall rains commence. Found mainly near ponds in humid forests, woodlands, grasslands, coastal scrub, and stream sides with plant cover. Most commonly occurs in lowlands or	High. Recorded occurrences in lower reaches of Redwood Creek within 1 mile of the study area near Muir Beach in 2004. The species has been observed in proximity to the CA-1 intersection, but no recorded occurrences within the study area. NPS data for species breeding site locations indicate a breeding pond just outside the study area near the

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
				foothills. Frequently found in woods adjacent to streams. Breeding habitat is in permanent or ephemeral water sources, such as lakes, ponds, reservoirs, slow streams, marshes, bogs, and swamps. Ephemeral wetland habitats require animal burrows or other moist refuges for estivation when the wetlands are dry. Known to occur at elevations from sea level to 5,000 feet above mean sea level.	southern terminus of the corridor. Frogs may disperse into nearby Redwood Creek and be present within southern reaches of Redwood Creek and adjacent wetlands and riparian areas.
Reptile	Northwestern Pond Turtle *Actinemys marmorata*	Proposed Threatened	Species of Special Concern	Diurnal and aquatic turtle found in ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches, with abundant vegetation, and either rocky or muddy bottoms, in woodland, forest, and grassland. In streams, prefers pools to shallower areas. Logs, rocks, cattail mats, and exposed banks are required for basking. May enter brackish water and even seawater.	Moderate. Observed at the mouth of Redwood Creek at Muir Beach in 1993. Recent observations have been made by NPS within the study area, including two within MWNM (Fong, pers. comm. 2023). Habitat within the study area would be suitable for this species along Redwood Creek and its riparian areas.

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Bird	Cooper's Hawk *Accipiter cooperi*	None	Watch List	Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river floodplains; also, live oaks. Inhabits woodland, chiefly of open, interrupted, or marginal type. This species is primarily diurnal.	Low. Suitable habitat consisting of hardwood woodlands are present within the study area. However, no CNDDB occurrences have been recorded within 5 miles of the study area.
Bird	Burrowing Owl *Athene cunicularia*	USFWS Bird of Conservation Concern	Species of Special Concern	Forages day and night in open, dry grassland and desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats. Nests in fossorial burrows of ground squirrels or other small mammals.	Low. Potentially suitable habitat occurs in annual grasslands within the study area; however, grassland habitats are marginal size and quality within the study area. One occurrence was recorded within 5 miles of the study area in 2013. No occurrences have been recorded within the study area.

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Bird	Marbled Murrelet *Brachyramphus marmoratus*	Threatened	Endangered	These fast-flying seabirds spend the majority of life on the ocean but come inland to nest. They generally nest in old-growth forests, characterized by large trees, multiple canopy layers, and moderate to high canopy closure. In California, nests typically are found in coastal redwood and Douglas-fir forests. These forests are close enough to the marine environment for the birds to fly to and from nest sites.	Low. The majority of the study area overlaps with critical habitat; however, old-growth coniferous forest habitats are of marginal size and quality within the study area. No CNDDB observations have been recorded within 5 miles of the study area.
Bird	White-Tailed Kite *Elanus leucurus*	None	Fully Protected	Various grassland habitats, urban land, oak woodlands with grassland for foraging. This species is primarily diurnal and crepuscular (twilight hours).	Low. Grassland and oak woodland habitats are present within the study area; however, they are of marginal size and quality. No CNDDB occurrences have been recorded within 5 miles of the study area.
Bird	Northern Spotted Owl *Strix occidentalis caurina*	Threatened	Species of Special Concern	Evergreen forest and woodland with suitable prey, which typically includes wood rat. This species is primarily nocturnal but may opportunistically forage during the daytime.	High. Study area provides potentially suitable foraging habitat for this species. CNDDB occurrences from the NSO database indicate multiple occurrences and four activity centers near the study area.

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Mammal	Pallid Bat *Antrozous pallidus*	None	Species of Special Concern	Daytime roosts in buildings and crevices; less often in caves, mines, and hollow trees. Nighttime roosts in buildings, caves, mines, and cliff overhangs. This species is nocturnal.	Moderate. Study area provides potentially suitable habitat for this species. One CNDDB occurrence from 1961 has been recorded within 5 miles of the study area. However, no recent observations have been recorded. Potentially suitable roosting habitat is present within the study area.
Mammal	Townsend's Big-Eared Bat *Corynorhinus townsendii*	None	Species of Special Concern	Well distributed throughout a variety of habitats (coniferous forests, oak woodlands, broad-leaf forests, grasslands). Roosts in caves, buildings, tunnels, and other human structures. This species is nocturnal.	High. Two CNDDB occurrences have been recorded near the study area. Oak woodlands are present in the study area that may support this species.
Mammal	Western Red Bat *Lasiurus frantzii*	None	Species of Special Concern	Edge habitats of forest, rivers, fields and urban areas. Roosts alone in leaves of trees; roosts in leaf litter in the winter. This species is nocturnal.	Moderate. Study area provides potentially suitable habitat for this species; however, no CNDDB occurrences have been recorded within 5 miles of the study area. Bat surveys performed by NPS have detected this species in the general vicinity (NPS 2018a) within MWNM.

Classification	Common Name/ *Scientific Name*[a]	Federal Regulatory Status	State Regulatory Status	Habitat Requirements[b]	Potential to Occur in Study Area
Mammal	American Badger *Taxidea taxus*	None	Species of Special Concern	Occupies a diversity of habitats throughout the state; principal habitat requirements include sufficient prey base, friable soils, and relatively open, uncultivated ground. This species is mainly nocturnal.	Low. Potentially suitable habitat occurs in open habitats such as coyote brush scrub located throughout the study area. Only one CNDDB occurrence from 1944 has been recorded within 5 miles of the study area. No recent observations have been recorded within the study area. Recent observations by NPS have been recorded within the general vicinity (NPS 2023c).

[a] CNDDB (CDFW 2022a)

[b] Sources
Marin County 2023a
CDFW 2022a
USFWS 2023a

DPS = distinct population segment
ESU = evolutionarily significant unit

Bird species listed in Table 4-5 are protected under the Migratory Bird Treaty Act. Bald and golden eagles are protected under both the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The study area contains habitat for various species of migratory birds not listed in Table 4-5, including raptors, vireos, and warblers. Approximately 30 different species of birds were identified during field surveys (Jacobs 2022b).

As noted in Table 4-5, four NSO activity centers are situated near the study area. Due to the sensitive nature of NSO activity centers, location data has been generalized and summarized in Table 4-6 (Avocet Research 2023; NPS 2023b). No NSO activity centers have been documented within the study area (NPS 2021b; CDFW 2022b).

Table 4-6. Northern Spotted Owl Activity Centers

Activity Center	General Location near Study Area	Last Observation Year
MRN0013	Northern terminus	2020
MRN0130	East of bridge replace and road realignment	2021
MRN0129	South of Kent Canyon	2021
MRN0043	South of Kent Canyon	2019

4.2.4 Critical Habitat

USFWS-designated critical habitat occurs within the study area for marbled murrelet, the coho salmon Central California Coast evolutionarily significant unit (herein referred to as "coho salmon"), and the steelhead Central California Coast distinct population segment (herein referred to as "steelhead"). Critical habitat for marbled murrelet overlaps most of the study area except for the southernmost portion. Physical and biological features specific to the marbled murrelet include the following (NARA 2016):

- Individual trees with potential nesting platforms
- Forested areas within 0.5 mile of individual trees with potential nesting platforms, and with a canopy height of at least one-half the site-potential tree height; this includes all such forests, regardless of contiguity

These marbled murrelet critical habitat features are not known to occur within the study area.

Critical habitat for coho salmon has been designated as "accessible reaches of all rivers (including estuarine areas and tributaries) between Punta Gorda and San Lorenzo River in California including two San Francisco Bay streams: Arroyo Corte Madera del Presidio and Corte Madera Creek" (*Federal Register* 64 Section 24049). Redwood Creek and Kent Creek are designated critical habitat for coho salmon. The entirety of Redwood Creek within the study area is also designated steelhead critical habitat

(NMFS 2005). Redwood Creek is mapped within the current designation of essential fish habitat (EFH) for coho salmon (Pacific Fishery Management Council 2014). EFH for steelhead has not been designated.

4.2.5 Invasive Species

The New Zealand mudsnail (*Potamopyrgus antipodarum*) is known to be present throughout Redwood Creek in the study area. This species can outcompete other macroinvertebrates in aquatic ecosystems. This can result in a less diverse and less nutritious diet for fish and other aquatic organisms in these ecosystems (CDFW 2025). NPS and CDPR have identified this species within Redwood Creek throughout the study area.

4.3 Regulatory Setting

This section provides an overview of federal, state, and local biological resource regulations.

4.3.1 Federal

There are seven federal regulations that are applicable to the Proposed Project related to biological resources, which are discussed in the following subsections.

4.3.1.1 Federal Endangered Species Act

In 1973, the federal ESA was established to protect threatened and endangered species and their habitats. Under Section 7 of this act, federal agencies are required to consult with the USFWS and NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or impact designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. Section 9 of the ESA prohibits the take of threatened or endangered species, which is defined as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

4.3.1.2 Magnuson-Stevens Fisheries Conservation Management Act

The Magnuson-Stevens Fisheries Conservation Management Act requires identifying and conserving EFH. The EFH provisions of the act require heightened consideration of habitat for commercial fish species in resource management decisions. EFH is defined as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity” (*United States Code* [U.S.C.] 16 Section 1802(10)). Federal and state agencies, NMFS, and regional fishery management councils work together to identify EFH for each federally managed fish species and develop conservation measures to protect and enhance these habitats.

Under the act, fisheries management plans are also developed that can include identifying habitat areas of particular concern, which are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated habitat areas of particular concern are not afforded regulatory protection under the act.

4.3.1.3 Migratory Bird Treaty Act

Pursuant to the Migratory Bird Treaty Act of 1918, federal law prohibits the taking of migratory birds, their nests, or their eggs (16 U.S.C. 703). In 1972, the Migratory Bird Treaty Act was amended to include protection for migratory birds of prey (such as raptors). The USFWS enforces the Migratory Bird Treaty Act (16 U.S.C. 703-711).

4.3.1.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c) prohibits the take of bald or golden eagles, including their parts, nests, or eggs. In terms of the act, "take" is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

4.3.1.5 Federal Noxious Weed Act

The federal Noxious Weeds Act (7 U.S.C. 2801-2813 and 7 CFR 360) addresses preventing the spread of noxious weeds and seeds across international borders and the transport of weeds within the U.S. on roadways. The Secretary of Agriculture designates which plants are noxious weeds, and coordinates with federal, state, and local agencies, and private entities to control, eradicate, or prevent the spread of noxious weeds.

4.3.1.6 CWA and Executive Order 11990

Under Section 404 of the CWA, the USACE regulates the discharge of dredged and fill material into waters of the United States. These waters generally include wetlands and other waters, such as intrastate lakes, rivers, streams, mudflats, and tributaries to those waters. The EPA shares responsibility over waters of the United States, with the USACE overseeing the Section 404 permit program.

Wetlands are defined as 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. Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. Wetlands generally include swamps, marshes, bogs, and similar areas.

Executive Order (EO) 11990 directs federal agencies to observe a "no net loss" of wetlands in order to "minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands."

4.3.1.7 NPS Management Policies

NPS Management Policy 4.4.2 outlines management methods for native plant and wildlife species within the national park system. This policy calls for native species to be left to natural processes. Intervention to manage native species may occur only when it will not cause unacceptable impacts to the species or is required because human influence has impacted the population or is needed to protect cultural resources and human health and safety, or to accommodate development or research, among others. The spread of exotic or invasive species can directly impact native plant populations, and NPS Management Policy 4.4.4 directly deals with the management of such species. In general, the policy prohibits introducing invasive species to parks and requires the management and removal of invasive species as deemed feasible and effective (NPS 2006).

4.3.2 State

There are nine state regulations that are applicable to the Proposed Project related to biological resources, which are discussed in the following subsections.

4.3.2.1 California Endangered Species Act

CESA states that "all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved" (CDFW 2023a). Section 2081 of the CESA addresses the issuance of an Incidental Take Permit from the CDFW, which may be required for projects that could result in the take of a state-listed threatened or endangered species. Under the CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species. An Incidental Take Permit is required only where take of a state-listed species is not authorized under the federal ESA and is not otherwise determined by CDFW to be consistent with the CESA pursuant to Fish and Game Code Section 2080.1. The CDFW is responsible for all state-listed plant and animal species that may occur within the study area under CESA (*California Fish and Game Code* Section 2050–2116).

4.3.2.2 CEQA Section 15380

CEQA Section 15380 independently defines "endangered" plants and wildlife as those whose survival and reproduction in the wild are in immediate jeopardy, and "rare" as species that could become endangered in the future if their habitat is degraded. CEQA

therefore requires projects to analyze the potential of species to be impacted regardless of their legal status. The CDFW acts as a trustee agency under CEQA.

4.3.2.3 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act, as amended (*California Water Code* Section 13000 et seq.), establishes the California State Water Resources Control Board's (SWRCB's) authority over groundwater and surface water quality in California.

4.3.2.4 RWQCB Resolution 2008-0026

RWQCBs regulate water quality using the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB 2021). California State RWQCB Resolution 2008-0026 sets forth a policy of protecting both wetlands and riparian areas for the purpose of maintaining water quality.

4.3.2.5 CCA Sections 30121, 30233, and 30240

The CCA asserts a number of measures to protect wetlands, streams, and other aquatic features within the coastal zone.

Section 30121 of the CCA defines wetlands as "lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, and fens."

Article 4, Section 30233 sets forth consistency requirements for the diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes. Diking, filling, or dredging of these waters are limited to activities such as those incidental to public services, restoration activities, and new or expanded port, energy, and coastal dependent industrial facilities. If the Proposed Project is an allowable activity, similar to Section 404(b)(1) of the CWA, then the Proposed Project can only be allowed if there is no feasible alternative that is less environmentally damaging.

Article 5, Section 30240 of the act also sets forth requirements to protect environmentally sensitive habitats, which includes wetlands, streams, and riparian areas. Such habitats are to "be protected against any significant disruption of habitat values," and using such areas is limited to only those dependent on the resources. Any development in areas adjacent to environmentally sensitive habitat areas must be designed to avoid and/or minimize substantial degradation and be compatible with continuance of the habitat.

4.3.2.6 *California Fish and Game Code* Sections 3511, 4700, 5050, and 5515

California Fish and Game Code Sections 3511, 4700, 5050, and 5515 were enacted in the 1960s to protect species considered rare or facing possible extinction. This legislation designated fish, mammal, amphibian, and reptile species as fully protected by the state. The taking or possessing of fully protected species is prohibited under the regulations unless a license or permit is obtained for research or relocation.

4.3.2.7 Native Plant Protection Act Sections 1900 to 1913

The Native Plant Protection Act (Section 1900–1913) was enacted in 1977. The act defines native plants and ranks species based on each species vulnerability, assigning a California Native Plant Society rank as follows:

- 1A – Presumed extirpated in California and either rare or extinct elsewhere
- 1b – Rare, threatened, or endangered in California or elsewhere
- 2a – Presumed extirpated in California, but common elsewhere
- 2b – Rare, threatened, or endangered in California, but common elsewhere
- 3 – Plants where more information is required (Review List)
- 4 – Limited distribution (Watch List)

4.3.2.8 *California Fish and Game Code* Sections 3503, 3503.5, and 3800

Sections 3503, 3503.5, and 3800 of the *California Fish and Game Code* specifically protect nests and eggs of birds of prey. The code prohibits the "take, possession, or destruction of birds, their nests, or eggs." Any disturbance that provokes birds to abandon their nests or interferes with reproductive behavior is considered a take. Protections cover all migratory, non-game birds.

4.3.2.9 California Pest Prevention System

The California Pest Prevention System addresses the exclusion, detection, eradication, management, and public education of pests, including noxious weeds. The California Pest Prevention System is regulated by laws instituted by the California Department of Food and Agriculture and County Departments of Agriculture under the *California Food and Agricultural Code*. The *California Food and Agricultural Code* prioritizes more than 130 species that are considered noxious weeds and provides management directives based on species designation.

4.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to biological resources, which is discussed in the following subsection.

4.3.3.1 *Marin Countywide Plan 2007-2020*

The *Marin Countywide Plan* (Marin County 2007) contains the following policies that apply to the Proposed Project area:

- **BIO-1.4 Support Vegetation and Wildlife Disease Management Programs**. Support agency programs and proven methods to limit the impacts of Sudden Oak Death syndrome and any other diseases harmful to native vegetation and wildlife in Marin County, while addressing any potential adverse effects on sensitive resources.
- **BIO-1.5 Promote Use of Native Plant Species**. Encourage use of a variety of native or compatible non-native, non-invasive plant species indigenous to the site vicinity as part of project landscaping to improve wildlife habitat values.
- **BIO-1.8 Restrict Use of Herbicides, Insecticides, and Similar Materials**. Encourage the use of integrated pest management and organic practices to manage pests with the least possible hazard to the environment. Restrict the use of insecticides, herbicides, or any toxic chemical substance in sensitive habitats, except when an emergency has been declared; the habitat itself is threatened; a substantial risk to public health and safety exists, including maintenance for flood control; or such use is authorized pursuant to a permit issued by the agricultural commissioner. Encourage nontoxic strategies for pest control, such as habitat management using physical and biological controls, as an alternative to chemical treatment, and allow use of toxic chemical substances only after other approaches have been tried and determined unsuccessful. Continue to implement the Integrated Pest Management ordinance for county-related operations.
- **BIO-2.1 Include Resource Preservation in Environmental Review**. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving “no net loss” of sensitive habitat acreage, values, and function.
- **BIO-2.5 Restrict Disturbance in Sensitive Habitat During Nesting Season**. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.

- **BIO-2.6 Identify Opportunities for Safe Wildlife Movement**. Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in designing and expanding major roadways and other barriers in the county. Of particular concern is the possible widening of Highway 101 north of Novato to the county line, where maintenance of movement opportunities for terrestrial wildlife between the undeveloped habitat on Mount Burdell and the marshlands along the Petaluma River is critical.
- **BIO-2.8 Coordinate with Trustee Agencies**. Consult with trustee agencies (the California Department of Fish and Game, USFWS, NMFS, USACE, EPA, RWQCB, and Bay Conservation and Development Commission) during environmental review when special-status species, sensitive natural communities, or wetlands may be adversely affected.
- **BIO-4.5 Restore and Stabilize Stream Channels**. Pursue stream restoration and appropriate channel redesign where sufficient ROW exists that includes the following: a hydraulic design, a channel plan form, a composite channel cross section that incorporates low-flow and bankfull channels, removal and control of invasive exotic plant species, and biotechnical bank stabilization methods to promote quick establishment of riparian trees and other native vegetation.
- **BIO-4.7 Protect Riparian Vegetation**. Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.

4.4 Impact Analysis

The assessment of impacts to biological resources is provided in responses to the following questions.

Would the Proposed Project:

a) 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 California Department of Fish and Wildlife (CDFW), U.S. Fish and Wildlife Service (USFWS), or National Oceanic and Atmospheric Administration National Marine Fisheries Service?

a.1) Special-status Species

For the purposes of this Draft IS with Proposed MND, candidate, sensitive, and status species encompass the following:

- Species that are listed or designated as candidates for listing as rare, threatened, or endangered under the CESA
- Animal species designated as Species of Special Concern, Watch List, or Fully Protected by the CDFW
- Plant species with a California Rare Plant Rank of 1B and 2 by the California Native Plant Society (CNPS 2023)
- Species that are listed or formally proposed for listing as threatened or endangered under the federal ESA
- Migratory birds protected under the Migratory Bird Treaty Act

a.1.1) Plants

Direct effects to the minute pocket moss could include damage to or death of living individuals and loss of habitat through vegetation clearing and grubbing activities. Indirect effects could include loss of productivity through fugitive dust and habitat degradation through an increase in noxious weed populations. Based on the presence of potential suitable habitat in the study area, the Proposed Project may affect individual plants due to the presence of potential suitable habitat in the study area. However, no individuals have been observed in the study area in more than 50 years, and the likelihood the observed population still exists is low. Implementation of AMM BIO-1 through AMM BIO-3, AMM BIO-7, AMM BIO-14, and AMM BIO-16 would reduce impacts to special-status plants to less than significant during construction. Operation of the Proposed Project would have no impact.

a.1.2) Invertebrates

Direct effects to the western bumblebee and monarch butterfly could include vegetation clearing and grubbing activities. Additionally, these species may be affected by disturbances, such as noise, vibrations, and visual disturbances from vehicles and equipment. Indirect effects may include the potential for spreading noxious weeds that could outcompete native pollinator species, reducing potential foraging habitat. AMM BIO-1 and AMM BIO-16 would be implemented during construction to control noxious species, revegetate affected areas with native species, and incorporate pollinator species into the seed mix. Impacts to special-status invertebrates would be less than significant during construction. Operation of the Proposed Project would have no impact.

a.1.3) Fish

The impact analysis for fish is combined because the impact would be similar based upon the Proposed Project. Aquatic habitat for coho salmon, longfin smelt, and steelhead may be directly affected as a result of the direct loss of riparian habitat, which provides overhead cover, structure, and shading of aquatic habitat conditions. Loss of

riparian habitat may degrade and reduce the amount of available habitat within Redwood Creek, alter life events dependent on environmental conditions, and cause the fish to disperse into other areas. However, because various slope stabilization methods would be incorporated, the direct effects of reducing shading and cover would be temporary and the direct effects would improve during operation as the embankments become re-established with vegetation. As such, temporary disturbances to instream and overstory habitat are expected during construction that would result in beneficial impacts during operation.

As previously discussed, the Proposed Project would increase impervious surface by 0.6 acre. Pollutants from tire wear particles (6PPD [N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine]), gasoline, engine oil, lubricants, or other fluids can cause health effects to fish in a similar manner to amphibians. Pollutant levels can increase as stormwater runoff increases, as they are transported from the pavement to the creek during rain events. However, these effects are anticipated to be reduced, avoided, and/or minimized by using stormwater BMPs, such as biostrips and bioswales. Disturbed areas would be topsoiled and seeded with native vegetation and erosion control blankets, and embankment slopes would be stabilized by incorporating willow stakes and willow bundles.

Fish can be affected by noise and vibration. Injury and mortality to fish have been connected to vibration from construction activities (Muck 2010). Demolishing the existing bridge abutments is likely to require methods that would result in increased noise within the creek. Neither installing sheet piles nor using vibratory hammers within the creek is anticipated. Installation of biotechnical rockery and rock buttresses for slope stabilization may cause a temporary increase in noise within the creek from placement of large rock; however, these impacts are expected to be less than significant because the work zones would be isolated from flowing water. Overall, effects from noise and vibratory sources are expected to be isolated and not wide-ranging within the Proposed Project area. Implementation of AMM BIO-1 to AMM BIO-17 and AMM BIO-38 to AMM BIO-45 would result in less than significant impacts to special-status fish during construction. Additionally, implementation of MM BIO-3would reduce impacts to less than significant with mitigation incorporated to coho salmon and steelhead habitat during construction. Operation of the Proposed Project would have no impact.

a.1.4) Amphibians

Impacts for CRLF and California giant salamander are combined since they would be similar due to the Proposed Project. Construction could cause direct effects to CRLF and California giant salamander, such as harm and harassment from equipment, runoff, and sediment introduction; displacement from the destruction or degradation of habitat; and harassment from increased noise, vibration, and visual disturbances. An increased presence of personnel and equipment would increase the likelihood that these species

would incur injury from people or equipment. These disturbances could encourage these species to displace and leave habitats within the Proposed Project area.

California giant salamanders have been recorded within and near Redwood Creek (CDFW 2022a). CRLF have not been observed breeding within the study area (NPS 2023a), and therefore, the Proposed Project would not affect breeding habitat. Based on preliminary design and the aquatic resources delineation that was completed, a total of approximately 0.4 acre of aquatic nonbreeding habitat and 6.9 acres of upland/dispersal habitat would be temporarily affected, and 0.3 acre of aquatic nonbreeding habitat and 9.3 acres of upland/dispersal habitat would be permanently affected.

Permanent impacts on wetlands and natural watercourses will be addressed through applicable federal and state authorizations, as required, and implementation of avoidance, minimization, and mitigation measures, as applicable. Wetlands and natural watercourses temporarily impacted would be restored to preconstruction conditions and will be revegetated with native species. Additionally, a mitigation plan will be developed to address CRLF habitat effects as described in MM BIO-2.

These species may be indirectly affected downstream due to the introduction of polluted runoff and sediment into streams that drain into areas that could provide amphibian habitat. Hazardous materials and chemicals in the form of gasoline, engine oil, lubricants, or other fluids used could potentially enter Redwood Creek because of seepage or accidental spills. Additionally, increases in impervious surface (concrete/asphalt) may cause additional runoff to enter Redwood Creek and its tributaries during storm events, which may carry pollutants into the creek that could affect these species. A total of 0.6 acre of impervious surface would be permanently added because of the Proposed Project, which represents a 7.8 percent increase in impervious coverage from existing conditions. However, these effects are anticipated to be avoided and/or minimized with stormwater BMPs, such as biostrips and bioswales. The implementation of AMM BIO-1 through AMM BIO-16, AMM BIO-21 through AMM BIO-33, MM BIO-2, and MM BIO-4 would result in a less than significant impact with mitigation incorporated to special-status amphibians during construction and operation.

a.1.5) Reptiles

The northwestern pond turtle (NPT) (*Actinemys marmorata*) would most likely occur in the areas in or around Redwood Creek and in its adjacent riparian habitat. Aquatic, nesting, and overwintering/aestivation habitat would be temporarily and permanently affected by the Proposed Project. Up to approximately 6.70 acres of overwintering/aestivation habitat, 0.30 acre of aquatic habitat, and 0.18 acre of nesting habitat would be temporarily affected. Additionally, up to 8.67 acres of overwintering/aestivation habitat, 0.16 acre of aquatic habitat, and 0.23 acre of nesting habitat would be permanently affected. The in-water work in Redwood Creek from the

proposed removal of the existing bridge and slope stabilization may result in direct effects to potential habitat and cause the species to disperse. A potential increase in sediment and erosion resulting from construction near and within Redwood Creek may indirectly affect downstream individuals. However, sediment and erosion controls would be installed and BMPs would be maintained to help minimize the amount of sediment transport. Habitat within this area also could be degraded from the loss of stream bank vegetation. If turtles use this riparian area in the location of the proposed bridge realignment and proposed slope stabilization, they could be displaced. There is limited potential for harm or mortality to occur because it is likely the species would disperse prior to any earthwork, which would primarily occur in the summer, when turtles are more active. Thus, the potential for effects from equipment crushing or injuring individuals is low. If vegetation removal is required during winter months, there would be a higher likelihood of harm or mortality to individual turtles if in hibernation. Implementation of AMM BIO-1 to AMM BIO-17, AMM BIO-46 to AMM BIO-48, MM BIO-2, and MM BIO-4 would result in a less than significant impact with mitigation incorporated for special-status reptiles during construction and operation.

a.1.6) Birds

Vegetation disturbance, noise, and vibration from construction and operation, as well as visual disturbances from increased construction, could affect Cooper's hawk, burrowing owl, marbled murrelet, white-tailed kite, and NSO, if present.

Temporary visual and noise disturbances may make adjacent habitats less desirable during construction and could, therefore, disrupt typical behaviors of those individuals that may occupy the area. The USFWS guidance for estimating noise and visual disturbances to the NSO and marbled murrelet indicated that these species may be affected up to 330 feet from the Proposed Project. This distance considers the existing ambient noise levels from the existing roadway and factors in the types of equipment needed for construction (USFWS 2020). The high tree density and variation of topography in the surrounding area further help attenuate noise levels. Within this distance, noise levels are expected to attenuate based on the FHWA noise attenuation model for roadway noise (FHWA 2005).

Noise levels generated by the Proposed Project may affect foraging behaviors of special-status raptors, including the NSO. However, the potential for the Proposed Project to affect nesting behaviors is low. Woodlands within the study area generally lack the appropriate habitat to support NSO and marbled murrelet nesting based on a lack of dense, tall coniferous trees, although NSO may also nest within hardwood forest habitats (NPS 2023b). No NSO nests have been observed within 330 feet of the construction limits (CDFW 2022b; NPS 2021b; 2023b). A potential NSO nesting pair was recently observed near the central portion of the Proposed Project (Avocet Research Associates 2023). Hardwood forest habitats within the 0.25-mile buffer of this area may support potential NSO nest sites. The marbled murrelet is not known to breed

in Marin County, have not been observed within MWNM during recent surveys conducted by the NPS (2022b, 2021a), and therefore, would not be affected. The Cooper's hawk and white-tailed kite may potentially find suitable nesting habitat in the hardwood forest area within the proposed bridge realignment area; however, these species have a low likelihood of being affected, as neither species is commonly observed within the area.

Construction is anticipated to result in the removal of trees and vegetation adjacent to the roadway and within the proposed bridge realignment area. It is estimated that a total of 1.7 acres of woodlands would be temporarily affected and 2.2 acres of woodlands would be permanently affected. Approximately 1.2 acres of grasslands would be temporarily affected, and 2.0 acres would be permanently affected. However, tree removal and replacement would be addressed through applicable agency requirements and the Proposed Project's revegetation and tree replacement measures (e.g., MM BIO-4). Additionally, areas affected by construction would be revegetated with native seed mix as described in AMM BIO-1 and trees would be replaced as described in MM BIO-4. With implementation of AMM BIO-18 and AMM BIO-34 to AMM BIO-37, impacts to special-status birds would be less than significant during construction. Operation of the Proposed Project would have no impact.

a.1.7) Mammals

The pallid bat, Townsend's big-eared bat, western red bat, and American badger may be affected by vegetation removal, noise and vibration, and visual disturbances from presence of equipment and personnel. Vegetation removal could affect foraging and roosting habitat for bats, as well as foraging habitat for badgers. Approximately 1.7 acres of woodlands would be temporarily affected, and 2.2 acres of woodlands would be permanently affected. While human-built structures also can provide potentially suitable roosting for bats, few structures are present in the study area. No bats were identified roosting on the existing Redwood Creek bridge, which is the only structure proposed for removal that could support roosting. Therefore, affects to roosting habitat are expected to be primarily a result of vegetation removal. Bats within the study area generally are not migratory and tend to hibernate in the winter months, which means they have a higher risk of being affected during the winter months. Construction during winter months, if required, would be limited to vegetation removal.

Increased noise, vibration, and visual disturbances during construction could also temporarily affect individuals and encourage them to leave the study area. Noise levels are anticipated to increase beyond levels currently experienced along Muir Woods Road by 20 to 25 A-weighted decibels at 50 feet. However, noise levels should naturally attenuate within 330 feet of the Proposed Project. Additionally, the surrounding area is largely vegetated with high tree density in certain areas and varied topography, which further helps to attenuate noise levels. The type of vehicles that use the roadway are expected to remain similar; therefore, a permanent increase in noise during operation is

not anticipated. Additionally, habitat characteristics within, or adjacent to, the construction limits are expected to remain similar to existing conditions.

Nighttime activity during construction would not occur for the Proposed Project, which further reduces the potential for affects to badgers and bats because they are primarily nocturnal. Visual and noise disturbances may make adjacent habitats less desirable and could disrupt typical behaviors of those individuals that may occupy the area. However, this is anticipated to have little effect on these species because the Proposed Project would be localized and would occur within an already disturbed road corridor, except for the proposed bridge realignment. With the implementation of AMM BIO-18 though AMM BIO-20, impacts to special-status mammals would be less than significant during construction. Operation of the Proposed Project would have no impact.

a.2) Critical Habitat

Marbled murrelet critical habitat is mapped within most of the study area. However, only one large conifer tree (Douglas-fir) was observed during the tree survey and identified as a potentially suitable tree species for the marbled murrelet (Atkins 2019b). This tree is immediately adjacent to the road, and if the marbled murrelet were using the tree for habitat, it would therefore be subject to habitat fragmentation and traffic noise from proximity to the existing roadway. This individual tree does not meet the physical or biological features described by the USFWS for marbled murrelet critical habitat because it lacks suitable nesting platforms. There may be additional areas within the broader study area that meet the characteristics of critical habitat; however, those areas would not be affected by construction, except for noise levels that may extend beyond the construction limits. The vegetation communities within these areas would not be affected by operation. Therefore, the Proposed Project would not result in a loss of critical habitat. Additionally, marbled murrelets are not known to currently breed in Marin County and have not been observed within MWNM during recent surveys conducted by the NPS (2022b, 2021a). The Proposed Project would result in a less than significant impact on the critical habitat for the marbled murrelet during construction and operation.

Coho salmon and steelhead critical habitat would be directly affected through the existing Redwood Creek bridge demolition, slope stabilization, and culvert repairs and replacements. Habitat would not be permanently affected, as coho salmon and steelhead would continue to have access to spawning habitat and the habitat characteristics would not be altered. The quality and functionality of critical habitat in the proposed instream work areas, as well as downstream habitats, would be beneficially improved by addressing ongoing erosion and sediment issues and re-establishing overstory habitat that has been lost to slope failures. Effects to coho salmon and steelhead critical habitat could result in effects to instream habitat. However, a restoration plan will be developed to offset effects in consultation with NMFS, as described in MM BIO-3. The Proposed Project would have a less than significant impact

on critical habitat for coho salmon and steelhead with mitigation incorporated during construction and operation.

No impacts to NSO or CRLF critical habitat would occur during construction and operation because none of it is designated within the study area.

a.3) Essential Fish Habitat

Coho salmon are known to occur within Redwood Creek and therefore occupy freshwater EFH because the creek contains habitat necessary for coho salmon spawning, breeding, feeding, and migration corridors. Temporary adverse effects to California Central Coast salmon EFH may occur through the removal of the existing Redwood Creek bridge abutments, slope stabilization, and culvert repair and replacements. Overall, while EFH within the Proposed Project area may experience temporary adverse effects, EFH would be beneficially improved by addressing spawning, rearing, and migration habitat through reduced sediment loading and improved water quality from improving overstory cover, stream bank erosion, and roadway drainage during construction and operation. The Proposed Project would result in a less than significant impact on EFH during construction and operation.

a.4) Impact Determination

With mitigation incorporated, the Proposed Project would have a less than significant impact from construction and in-water work that may result in habitat modifications for federally listed species, including CRLF, coho salmon, and steelhead and for state-listed or other special-status species. For state-listed species that are also covered by federal ESA Section 7 Biological Opinions, a CESA consistency determination will be obtained. If project effects to state-listed species are identified that are not covered by federal authorization, additional CESA authorization (e.g., an Incidental Take Permit) would be obtained prior to construction, as applicable.

Mitigation measures include preparation of a compensatory mitigation plan to replace or improve habitat that may be impacted by the Proposed Project. Mitigation may be accomplished through onsite or offsite habitat mitigation projects, purchase of credits at an approved habitat mitigation bank, or a combination of these options. The mitigation plan will be finalized in coordination with the applicable federal resource agencies (e.g., USFWS, NMFS) and implemented in accordance with applicable federal authorizations and other approvals, including state water quality approvals, if applicable, prior to construction. Federal ESA Section 7 consultation with NMFS and USFWS has been completed for federally listed species and coordination with CDFW regarding state-listed species and CESA consistency is ongoing. The Proposed Project would have a less than significant impact with mitigation incorporated.

b) 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?

Vegetation trimming and removal would be required to widen the roadway to a consistent 22-foot-wide paved roadway, as well as implementing localized improvements, such as realignment of the bridge over Redwood Creek, and slope stabilization. Soil removal, grading, paving, trampling by equipment and personnel, and overall removal of habitat would impact vegetation. Based on the preliminary design, the Proposed Project would result in the temporary disturbance of approximately 7.0 acres of vegetation and the permanent disturbance of approximately 9.4 acres. Table 4-7 details these impacts by vegetation community. Design is still progressing, and the impact estimates are subject to change. Refinements through the final design process are anticipated to reduce impacts to vegetation.

Table 4-7 presents vegetation community groupings used in the CWHR System. The impacts estimated for riparian forest/shrubland are expected to be overestimated because field verification of vegetation datasets can yield minor differences in exact amounts of habitats present. Of the 3.8 acres of riparian habitat mapped during field surveys, it is estimated that approximately 1.7 acres of riparian habitat would be temporarily impacted and approximately 2.1 acres would be permanently impacted.

Table 4-7. Vegetation Community Impacts

Vegetation Community[a,b]	Construction limits (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)
Riparian Forest/Shrubland	7.0[c]	3.2	3.8
Drier Coastal Grassland/Scrub	2.0	0.8	1.2
Hardwood Forest (Eucalyptus, Coastal Live Oak, California Bay)	3.4	1.5	1.9
Dense Coyote Brush Scrub	1.3	0.5	0.8
Active Pasture	0.5	0.2	0.3
Douglas-Fir/Coast Redwood	0.5	0.2	0.3
Disturbance/Urban[d]	7.9	0.4	0.5
Moist Coastal Grassland	0.9	0.3	0.6
Totals	**23.4**	**7.0**	**9.4**

[a] Vegetation dataset provided by the CDFW/NPS CWHR System (NPS and CDFW 2003).

[b] Vegetation impact acreages are based on preliminary design and may be refined as design progresses.

[c] Riparian vegetation mapped in the field differs from the CWHR System measurement for this community type and overestimates the amount of riparian forest in the study area.

[d] Urban disturbance total also includes the existing roadway pavement and impervious areas. These were subtracted from the total permanent/temporary impact totals.

No sensitive natural communities were included on the CDFW CNDDB dataset for the study area. The Proposed Project would temporarily impact approximately 1.7 acres of riparian vegetation and permanently impact approximately 2.1 acres. Riparian habitat in the southernmost portion of the corridor is within the coastal zone boundary. Impacts to riparian habitat would be associated with resurfacing, restoring, and rehabilitating Muir Woods Road for public services (e.g., to maintain and improve public access to MWNM). Mitigation will be incorporated for permanent impacts to riparian habitat. Large trees removed that are subject to permitting requirements will be mitigated and replaced at a ratio determined through agency consultation as described in MM BIO-4. It is anticipated that trees would be replaced at a minimum of 1:1 ratio or greater. Areas impacted by construction would be revegetated through planting and seeding with native species as described in AMM BIO-1 and AMM BIO-2. Native pollinator species would be included in the seed mix as described in AMM BIO-16. The Proposed Project would have a less than significant impact with mitigation incorporated.

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, or similar) through direct removal, filling, hydrological interruption, or other means?

Impacts to wetlands and other waters are associated with temporary and permanent fill required for minor roadway widening, repairing and replacing culverts, stabilizing slopes along Redwood Creek, demolishing the existing Redwood Creek bridge, and restoring Redwood Creek at the demolition site. The proposed replacement bridge over Redwood Creek would be constructed outside of the ordinary high-water mark (OHWM) of Redwood Creek. While permanent impacts would occur to Redwood Creek, these are largely to reestablish the road embankment and creek bank where slope failures have occurred and to reconstruct the streambank at the bridge demolition site with FESLs. Temporary impacts are related to the area needed to move equipment and personnel, install sediment and erosion control measures, and install temporary stream diversions to isolate work zones from flowing water.

Based on the constrained nature of the Proposed Project corridor, and water-dependent components of the Proposed Project (e.g., culvert replacements), impacts to wetlands and other waters of the United States and waters of the state cannot be fully avoided. Table 4-8 summarizes these impacts. Ephemeral streams are currently not regulated by USACE but are regulated by the state under the Porter-Cologne Act.

Table 4-8. Impacts to Waters of the United States and Waters of the State

Aquatic Feature Type	Temporary Impact (acres, linear feet)	Permanent Impact (acres, linear feet)	Total Impacts (acres, linear feet)
Palustrine emergent wetlands	0.02[a]	0.13[b]	0.15
Palustrine scrub-shrub wetlands	0.10	0.00	0.10
Wetlands Total	***0.12***	***0.13***	***0.25***
Ephemeral stream[c]	0.01 (121)	0.03 (467)	0.04 (588)
Intermittent stream	0.05 (699)	0.01 (42)	0.06 (741)
Perennial stream (Redwood Creek)	0.22 (1,043)	0.15 (408)	0.37 (1,451)
Natural Watercourses Total	***0.28 (1,863)***	***0.19 (917)***	***0.47 (2,780)***

[a] Approximately 0.01 acre of palustrine emergent wetland temporary impacts are waters of the state only and would not be regulated as a waters of the United States.

[b] Approximately 0.10 acre of palustrine emergent wetland permanent impacts are waters of the state only and would not be regulated as a waters of the United States.

[c] Following the issuance of the revised "Definition of Waters of the United States," effective September 8, 2023 (33 CFR Part 328 and 40 CFR Part 120), ephemeral streams are generally not regulated by USACE. However, ephemeral streams are regulated as waters of the state under the Porter-Cologne Water Quality Act.

The Proposed Project is anticipated to permanently impact approximately 0.04 acre of wetlands under USACE jurisdiction. Approximately 0.11 acre of wetlands under USACE jurisdiction would be temporarily impacted. Approximately 0.01 acre of wetlands that are waters of the state would be temporarily impacted and approximately 0.10 acre of wetlands that are waters of the state would be permanently impacted. Impacts to wetlands would be compensated at a minimum 1:1 ratio. A CWA Section 404 Permit would be obtained as well as a CWA Section 401 Water Quality Certification. All conditions of the permit and certification would be adhered to. MM BIO-1 will mitigate the permanent loss of federal and state regulated wetlands. During construction, temporary stream diversions may be required during in-water work activities, but any dewatering activities would maintain downstream flows, as described in AMM BIO-40, and work would be planned to occur during dry or low-flow conditions, as described in AMM BIO-38. The Proposed Project would have a less than significant impact during construction and operation.

d) 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?

The Proposed Project would not substantially interfere with the movement of native migratory fish or wildlife species. During construction, flow in Redwood Creek would be temporarily diverted, including select areas of temporary dewatering. Flow would be

maintained through the creek and diversions would occur during the dry season (June 15 to October 31) or until sufficient rainfall brings adult fish into Redwood Creek, as described in AMM BIO-38, thereby avoiding the time when migratory fish, such as coho salmon and steelhead, are present in the study area.

The phased construction timing would avoid the breeding season for the CRLF. Culverts would be cleaned or replaced to restore function and passage of water, which would enhance passage and dispersal availability for CRLF, and other semi-aquatic organisms and fish, by removing potential barriers to movement. AMM BIO-21 to AMM BIO-33 would be implemented to avoid and/or minimize impacts to the CRLF.

Generally, vegetation removal would be restricted during the migratory bird season as described in AMM BIO-18. If construction must occur during the migratory bird season, preconstruction nest surveys would be completed prior to vegetation removal to ensure migratory birds protection. Revegetating areas impacted during construction with pollinator plant species as described in AMM BIO-16 would ensure that any migratory insects, such as the monarch butterfly, would be able to continue to use the Proposed Project area as a potential stop-over area for nectar sources during migration. The Proposed Project would have a less than significant impact during construction. Operation of the Proposed Project would have no impact.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The local Marin County tree removal permit (Marin County 2023d), as described in the *Marin County Municipal Code,* Section 22.62, does not apply to the Proposed Project because of the exceptions described in Section 22.06.050. No other local policies were identified. Construction and operation of the Proposed Project would have no impact.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

There are no habitat conservation plans; natural community conservation plans; or other approved local, regional, or state habitat conservation plans applicable to the Proposed Project. Construction and operation of the Proposed Project would have no impact.

4.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measures would be implemented to avoid and/or minimize impacts to biological resources:

- **AMM BIO-1:** Areas impacted by construction would be restored to preconstruction conditions through planting and seeding with native species. All plants used in restoration would come from local nurseries implementing BMPs to prevent the spread of disease.

- **AMM BIO-2:** The Proposed Project would conform to the Federal Noxious Weed Act and applicable state and local seed and noxious weed laws.
- **AMM BIO-3:** Prior to construction, workers would receive Worker Environmental Awareness Training (WEAT) conducted by a qualified biologist. WEAT would include identification of biological resources (special-status species that may be found in the Proposed Project area), penalties for noncompliance, and an overview of conservation measures and avoidance and/or minimization measures that are required during construction. Handouts summarizing information presented during WEAT and contact information would be provided to the workers. After employees have completed training, they would sign a form stating that they attended the training and understand all of the conservation and protection measures.
- **AMM BIO-4:** All construction equipment would be washed thoroughly to remove all dirt, plant, and other foreign material before mobilizing to the work site. Each piece of equipment would be inspected before entering the work site. Records of cleaning and inspections would be maintained.
- **AMM BIO-5:** During construction, food scraps or other trash or garbage would be deposited in covered or closed trash containers. Promptly remove garbage or trash produced from construction to avoid creating wildlife attractants.
- **AMM BIO-6:** All material and debris generated as a result of construction would be removed from the site and disposed of at an approved location.
- **AMM BIO-7:** Dust control would occur as needed on active work areas where dirt or fine particles are exposed. All equipment would have mufflers, and operators would avoid leaving equipment and vehicles idling for more than 5 minutes when parked or not in use.
- **AMM BIO-8:** Implement an erosion and sediment control plan to control impacts and to restore vegetation and stabilize soils in areas impacted by construction. The plan would include necessary requirements regarding erosion control and would implement BMPs for erosion and sediment control as required. Following construction, restoration would occur to areas disturbed during construction. Only appropriate native plant material would be used for erosion control and restoration. BMPs would be placed on all disturbed slopes and material disposal sites, as indicated by the erosion and sediment control plan. Erosion control measures may include chipping and mulching all slash materials and placing the mulch on disturbed soil, placing sediment traps, using silt fences, and checking dams in ditches.
- **AMM BIO-9:** Erosion control measures would be maintained in working condition during construction or until the measures are no longer needed during construction.
- **AMM BIO-10:** A spill prevention, control, and countermeasure plan would be developed before construction that would address measures for prompt and effective response to any accidental spills.

- **AMM BIO-11:** All fueling, equipment storage, and vehicle maintenance would occur at least 65 feet away from any riparian habitat or water body.
- **AMM BIO-12:** Heavy equipment and pumps would be checked daily for leaks. Equipment with leaks would not be used until leaks are fixed. Any leaks, drips, or spills would be immediately controlled to prevent entry of contaminants into waterways, ditches, or other tributaries to waterways.
- **AMM BIO-13:** No herbicides or pesticides would be used.
- **AMM BIO-14:** Construction staging would occur in previously disturbed areas and would be sited to avoid and/or minimize sensitive resources such as areas of intact native plant communities, wetlands, and special-status species habitat.
- **AMM BIO-15:** Culverts would be cleaned or replaced with 15-inch- to 48-inch-diameter culverts to restore function and passage of water, which would enhance passage and dispersal availability for CRLF by removing potential barriers.
- **AMM BIO-16:** Native pollinator plant species would be incorporated into the seed mix required for revegetation and areas disturbed by construction.
- **AMM BIO-17:** The NPS and CDPR would be notified of any fish relocation activities, so they have the opportunity to review relocation methods and proposed relocation sites with FHWA and the biological monitor.

The following avoidance and/or minimization measure would be implemented to avoid and/or minimize impacts to migratory birds, raptors, and bats:

- **AMM BIO-18:** Vegetation clearing and grubbing (small trees [less than 20 inches DBH], shrubs, herbaceous species) would occur between September 1 and January 31. If clearing and grubbing of small trees, shrubs, and herbaceous species must occur from February 1 to August 31, a preclearing nest survey would be conducted to identify any active nests within 7 calendar days of the planned vegetation removal activities. If active raptor or migratory bird nests are identified within the study area, a qualified biologist would determine the appropriate avoidance strategy, subject to approval by the FHWA-CFLHD Contracting Officer, and determine whether a no-work buffer is required. If necessary, no work would occur until the young have fledged or the nest is no longer active.

The following avoidance and/or minimization measure would be implemented to avoid and/or minimize impacts to bats:

- **AMM BIO-19:** If tree removal is planned between April 16 and August 31 or during the hibernation period of October 16 through February 28, a bat habitat assessment plan would be prepared by the contractor-provided qualified biologist. At a minimum, the plan would detail how trees proposed for removal would be assessed for habitat suitability and, if determined suitable, method and timing of removal. Adherence to

other timing restrictions, such as for NSO and migratory birds, must be considered in development of the plan.

The following avoidance and/or minimization measure would be implemented to avoid and/or minimize impacts to the American badger:

- **AMM BIO-20:** If an American badger is observed within or adjacent to (up to 50 feet from) the construction limits, the contractor would halt construction in the immediate area of observation. Construction would commence upon FHWA-CFLHD Contracting Officer approval. The FHWA-CFLHD Contracting Officer would notify Marin County, NPS and CDFW of the occurrence. If the badger does not leave of its own volition, the FHWA-Contracting Officer, in coordination with Marin County, NPS, and CDFW, would determine the appropriate course of action.

The following avoidance and/or minimization measures will be implemented to avoid and/or minimize impacts to the CRLF:

- **AMM BIO-21:** A USFWS-approved biologist(s) would monitor construction tasks that have the potential to result in take of the CRLF. This would include monitoring and preconstruction clearance of the active work area for all of the following:
  - Initial ground disturbance and vegetation removal
  - Construction occurring 24 hours after a rain event
  - All activities below the top of streambanks or in wetland(s)
  - Ground-disturbing activities within 40 feet of wetted channels and wetlands
- **AMM BIO-22:** Before the start of work each morning, construction personnel would inspect under equipment and in material stockpiles where CRLF could be sheltering in the active work area and would thoroughly inspect potential sheltering habitat (e.g., pipes, culverts) prior to disturbance. Stockpiles should incorporate protective barrier, such as silt fence, to prevent CRLF from sheltering in these areas.
- **AMM BIO-23:** Excavated steep-walled holes or trenches more than 1 foot deep would be provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each workday to assist with avoiding entrapment of wildlife. Escape ramps or covered open trenches would help prevent injury or mortality of wildlife if they fall into trenches and become trapped. Trenches would be inspected for the presence of federally listed species at the beginning of each workday by a designated person(s) trained by the USFWS-approved biologist. Designated personnel would report daily during construction to the USFWS-approved biologist on the findings of these inspections and daily monitoring.
- **AMM BIO-24:** All work that could result in direct injury, disturbance, or harassment of the individual frog must immediately cease until clearance to resume activities is issued by the FHWA-CFLHD Contracting Officer. Any CRLF found within the construction limits would be monitored until the frog or frogs have left of their own

volition or would be captured by the USFWS-approved biologist and held for the minimum amount of time necessary for release in a suitable habitat outside of the construction limits. Suitable habitat for release would be identified by the USFWS-approved biologist prior to the start of construction. Suitable habitat is considered equivalent to the habitat (topography, exposure, vegetation) where the frog was found and not more than 0.25 mile upstream or downstream of where the frog was found. Release sites would also be coordinated with NPS and CDPR prior to construction.

- **AMM BIO-25:** CRLFs would be captured using nets or by hand. The biologist would avoid reaching for the frog by the tail, head, or limbs. The duration of handling individuals would be limited to the maximum extent possible. Captured adults would be kept moist, cool, and in an aerated environment, such as a bucket containing a damp sponge or cloth, and periods of direct sun exposure would be minimized. Time in captivity would be minimized to the greatest extent practicable.
- **AMM BIO-26:** Individual animals would not be placed in positions/containers where they may physically contact other individuals.
- **AMM BIO-27:** Multiple captured CRLFs would not be released to the same location.
- **AMM BIO-28:** Soaps, oils, creams, lotions, repellents, or solvents of any sort would not be used on hands within 2 hours before and during periods when they are capturing and relocating animals. To avoid transferring disease (chytrid fungus) or pathogens between sites during the course of handling the animals, the biologists would take appropriate measures to disinfect all equipment and clothing, such as those described in The Declining Amphibian Task Force Fieldwork Code of Practice guidance.[2]
- **AMM BIO-29:** Pictures and GPS [global positioning system] points would be taken of the frog, the capture site, and the relocation site. Observations would be recorded on CNDDB field sheets and sent to CDFW. The USFWS would be notified within 1 day of relocating individuals.
- **AMM BIO-30:** Any dewatering using pumps would include screening not to exceed a 0.2-inch mesh size. Pump intakes would be placed in larger, perforated intake basins to allow water to be drawn into the pump while protecting aquatic organisms from entrainment. Both the outside of the intake basin and the pump intake would be screened. The perforated intake basin would be large enough to reduce the intake velocity so as not to impinge aquatic organisms on the screen.
- **AMM BIO-31:** Plastic monofilament netting (erosion control matting) or similar material containing netting would not be used at the Proposed Project site because

[2] https://www.fws.gov/sites/default/files/documents/declining-amphibian-task-force-fieldwork-code-of-practice.PDF

animals may become entangled or trapped in it. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

- **AMM BIO-32:** CRLFs may take refuge in cavity-like structures (pipes, culverts). To prevent entrapment, any materials stored for one or more overnight periods would be either securely capped prior to storage or thoroughly inspected by the onsite biologist or the assigned contractor personnel for individuals before the structure is used. If individuals are found, protocols for handling and relocating individuals would be followed.
- **AMM BIO-33:** All in-water work would occur during the dry period between June 15 and October 31 or until sufficient rainfall brings adult fish into Redwood Creek. This is outside of the CRLF breeding season, which is generally November to May.

The following avoidance and/or minimization measures will be implemented to avoid and/or minimize impacts to NSO, migratory birds, and bats:

- **AMM BIO-34:** Clearing of large trees (20 inches DBH or greater) would occur between September 1 and December 31, which avoids the NSO nesting season, as well as the migratory bird season, and the bats' (western red bat, pallid bat, Townsend's big-eared bat) pupping season, which is generally April 16 through August 31.
- **AMM BIO-35:** No nighttime work would occur in any areas of the Proposed Project throughout the duration of the construction schedule. Construction would be limited to daylight hours (0.5 hour after sunrise to 0.5 hour before sunset).

The following avoidance and/or minimization measures will be implemented to avoid and/or minimize impacts to the NSO:

- **AMM BIO-36:** No human activities would occur within a visual line of sight of 330 feet or less from any known NSO nest locations within the Proposed Project area (USFWS 2020a).
- **AMM BIO-37:** No construction activity would occur within NSO habitat areas (northern two-thirds of the Proposed Project area) during the NSO nesting season (February 1 – July 31).

The following avoidance and/or minimization measures will be implemented to avoid and/or minimize impacts to the Central California Coast steelhead and Central California Coast coho salmon:

- **AMM BIO-38:** Construction below the OHWM would be limited to the dry season between June 15 and October 31 or until sufficient rainfall brings adult fish into Redwood Creek.
- **AMM BIO-39:** Any temporary dewatering would be conducted in accordance with the NMFS Water Drafting Specifications (NMFS 2001).

- **AMM BIO-40:** Dewatering activities would maintain downstream flows. Pumped water would be discharged in accordance with permit conditions.
- **AMM BIO-41:** For construction below the OHWM, the workspace would be isolated to avoid and/or minimize construction in flowing water. The Proposed Project would be completed in such a manner to allow for fish passage through the Proposed Project area by maintaining stream flows. Prior to construction, the workspace would be isolated from flowing water to prevent sedimentation and turbidity and avoid impacts to fish. The diversion would remain in place during the Proposed Project and be removed immediately after work is completed in a manner that would allow flow to resume with the least disturbance to the substrate.
- **AMM BIO-42:** A qualified biologist would monitor the construction site during placement and removal of channel diversions to ensure that impacts to salmonids are minimized.
- **AMM BIO-43:** Due to the relatively small areas of Redwood Creek that may need to be isolated and dewatered, entrapped fish would be removed by pumping-down the pool and seining or dipnetting to capture and relocate.
- **AMM BIO-44:** If required, fish relocation activities would be performed by qualified fisheries biologists only, and in a manner that minimizes all potential risks to ESA-listed salmonids.
- **AMM BIO-45:** A netting, tarp, or other appropriate cover would be placed beneath the existing Redwood Creek bridge during deconstruction to prevent debris from falling into the area below the OHWM. If bridge debris falls below the OHWM during demolition, it would be removed from the stream without dragging the material along the streambed.

The following avoidance and/or minimization measures will be implemented to avoid and/or minimize impacts to the NPT:

- **AMM BIO-46:** A qualified biologist would conduct preconstruction surveys to determine the presence of the NPT in both upland and aquatic habitats within the limits of disturbance by a qualified biologist in accordance with best available protocol practices and techniques outlined in the visual encounter survey protocol in Samara Group and Oregon Native Turtle Working Group (Samara Group and Oregon Native Turtle Working Group 2020). Surveys would occur within 24 hours prior to initial ground disturbance in areas where exclusion fencing is not feasible to install. Other habitat areas would be surveyed no more than 10 days before the start of ground-disturbing activities, after the implementation of exclusionary fencing. At least three surveys would be conducted during NPT basking weather conditions (March 1 – October 31) prior to the start of construction.

- **AMM BIO-47:** An NPT exclusion fencing plan would be developed to prevent the NPT from entering nesting and overwintering habitat in the Proposed Project area. For areas where exclusion fencing is not feasible, suitable overwintering cover (e.g., leaf litter layer and large woody debris) would be removed before overwintering begins on October 15 and would be maintained free of suitable overwintering cover daily until overwintering ends on March 1. Burrows would be inspected for overwintering NPT during the overwintering season by a qualified biologist, and any observed NPT would be relocated out of the work area consistent with a USFWS-approved relocation plan. The burrows then would be collapsed by a qualified biologist to prevent NPT from utilizing them within the work area.
- **AMM BIO-48:** An NPT relocation plan would be developed and approved by USFWS prior to construction. The plan would include the best available methods on how to handle NPT as well as identify areas for relocation in advance.

4.6 Mitigation Measures

The following mitigation measures will be implemented to reduce impacts to biological resources to less than significant with mitigation incorporated.

The following mitigation measure applies to wetlands and streambeds:

- **MM BIO-1:** Wetland and streambed permanent impacts will be mitigated on site or through a mitigation bank, as required. Mitigation ratio requirements will be determined in consultation with regulatory agencies prior to construction.

The following mitigation measure applies to the NPT and CRLF:

- **MM BIO-2:** A mitigation and monitoring plan will be developed for CRLF and NPT habitat impacts and will be provided to the USFWS for review and approval prior to construction. Mitigation includes enhancement of habitat for the CRLF and NPT at locations in GGNRA. The compensatory habitat also includes the purchase of 9.25 acres of CRLF credits from a USFWS-approved conservation bank in the San Francisco Bay Area where both adult and juvenile NPT are documented as present (e.g., Oursan Ridge Conservation Bank in Contra Costa County).

The following mitigation measure applies to the Central California Coast steelhead and coho salmon:

- **MM BIO-3:** A mitigation plan will be developed for habitat impacts and approved by NMFS prior to construction. Mitigation may include habitat improvements such as creation of deep pools and incorporation of large woody debris within Redwood Creek. Other options may be considered in consultation with NMFS, CDFW, NPS, and CDPR.

The following mitigation measure applies to trees:

- **MM BIO-4:** Removed trees will be replaced in accordance with permit requirements at a ratio determined in consultation with regulatory agencies.

5 CULTURAL RESOURCES

Would the Proposed Project:

Question	CEQA Determination
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	Less than Significant Impact
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	Less than Significant Impact
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	Less than Significant Impact

5.1 Methodology

CEQA does not require Section 106 consultation or an assessment of historic properties pursuant to the National Historic Preservation Act (NHPA); however, this explanation is provided as background for the discussion provided in this section. Although such consultations and assessments are not required under CEQA, they address the cultural resources that could be impacted by the Proposed Project that are distinct from the tribal cultural resources, which is discussed in Section 18 (Tribal Cultural Resources). Historic properties are protected under the NHPA. The Proposed Project is a federal undertaking; therefore, consultation under Section 106 of the NHPA was conducted by FHWA-CFLHD, which included establishing an area of potential effects (APE) and consulting with the State Historic Preservation Officer (SHPO), other consulting parties, and federally recognized tribes to identify historic properties. Section 106 consultation was completed August 29, 2024.

Discussion of Native American background research, identification efforts, and consultation in compliance with CEQA and AB 52 is included in Section 18, Tribal Cultural Resources.

An APE was established that encompasses potential direct effects (immediate physical impacts or changes that occur at the same time/place as the undertaking) and includes the area of ground disturbance and the horizontal and vertical extent of all Proposed Project construction activities. Based on the Proposed Project scope, an APE for indirect effects (impacts that occur later in time or farther away, such as aesthetics and noise) was not required. The APE is the same for both the built environment and archaeology and generally consists of a 50-foot-wide corridor centered on the existing roadway, which expands to a 200-foot width where the bridge replacement and road realignment are proposed. The APE totals approximately 2.5 linear miles and encompasses approximately 23 acres. The vertical APE ranges between 9 inches and 8 feet for asphalt and culvert replacements. Installing the new bridge foundations would involve drilling to an undetermined depth to reach bedrock.

A cultural resources inventory was conducted in 2024. The inventory included a records search at the California Historical Resources Information System's Northwest Information Center (NWIC), literature and archival studies, a buried archaeological site sensitivity assessment, intensive pedestrian surveys, and subsurface archaeological excavation testing to identify cultural resources within the APE (Jacobs 2024d).

5.2 Environmental Setting

The historic properties listed in Table 5-1 were identified within the APE and are briefly described in this section. To protect these sensitive resources, their specific locations are not disclosed in this Draft IS with Proposed MND.

Table 5-1. Historic Properties within APE

Site Description	Site Designation/ Number	NRHP/CRHR Status
Dipsea Trail	P-21-000493/ CA-MRN-566H	Listed (2010), Criterion A/1, contributing element to Muir Woods Monument Historic District P-21-003020.
Brazil's Dairy Ranch	P-21-000483/ CA-MRN-552H	Not evaluated. Assumed eligible for purposes of the Proposed Project.
Muir Woods Inn Complex	P-21-000495/ CA-MRN-568H	Building: recommended not eligible Archaeological site: unevaluated. Site assumed eligible for purposes of the Proposed Project.
Mid-20th century bottle and can scatter	P-21-002875/ CA-MRN-723H	Not evaluated. Assumed eligible for purposes of the Proposed Project.

CRHR = California Register of Historical Resources
NRHP = National Register of Historic Places

The following resource within the APE is listed on the NRHP/CRHR:

- Dipsea Trail (Panoramic Highway to Redwood Creek Section) (P-21-000493): This trail is listed individually in the NRHP. Although it is also a contributing element to the MWNM Historic District, the trail segment within the APE is non-contributing to the historic district. The 7-mile trail represents the oldest continuously used hiking trail in California and is the site of the historic Dipsea foot race that has been run since 1905. Predating the Frank Valley Road/Muir Woods Road and establishment of MWNM, its period of significance is 1904 to 1964. Most of the trail is a narrow footpath with occasional stairs and bridges, as well as other segments composed of paved roadways and road crossings. The trail is locally significant under Criterion A within the context of social and recreational development of physical fitness through hiking and long-distance running in the U.S. The portion of the trail within the APE

includes wood beam and dirt stairs on both sides of Muir Woods Road where the trail crosses the road.

5.2.1 Resources Unevaluated and Assumed NRHP/CRHR Eligible

Three historic-period archaeological resources—two of them with a built component—are wholly or partly within the APE and are assumed to be eligible for the NRHP/CRHR for the purposes of the Proposed Project:

- Brazil's Dairy Ranch (P-21-000483/CA-MRN-552H) (built and archaeological components): This site includes remnants of a dairy ranch with houses, barns, refuse deposits, quarry, road, and bridge. The site retains traces of a late 1800s ranch owned by William Kent, but most archaeological evidence reflects the Brazil's Dairy Ranch (circa 1916 through 1968). This site has been occupied by CDPR employee residences and working barns and other structures since CDPR took over the land in 1968. The only portion of the archaeological site and buildings within the APE lies at the southeastern boundary of the resource along Muir Woods Road, where a wooden fence separates the property from the Muir Woods Road ROW.
- Muir Woods Inn Complex (P-21-000495/CA-MRN-568H) (built and archaeological components): The site comprises one existing building, terracing, and plantings associated with former structures that included housing, cabin rental, storage, and concessions. The complex functioned as part of MWNM's tourist industry in the early- to mid-20th century. The Muir Woods Inn building was previously determined not eligible for listing in the NRHP. The building, terracing, and plantings are outside the APE. The site's ground surface has been cleared of artifacts at least twice when buildings were removed. Frequent NPS projects, such as sewer installation and repairs, have not yielded buried resources within the site boundaries or within Muir Woods Road shoulders in the immediate vicinity. There is very low potential for historically significant buried archaeological resources within the APE.
- Mid-20th century bottle and can scatter (P-21-0002875/CA-MRN-723H): This site was not relocated (found) during the pedestrian survey because it was obscured by fallen trees.

5.2.2 Resources Not Eligible for NRHP/CRHR

Resources identified within the APE that were either previously determined or recommended as not eligible for NRHP include the Three Sequoias site consisting of a 1940-1960 residence and pre-1945 orchard (P-21-000498/CA-MRN-571H), two Caltrans bridges (27C0107 and 270108), Muir Woods Road/Frank Valley Road (P-21-000497/CA-MRN-570H), and the portion of Deer Park Fire Road within the APE (P-21-003089/CA-MRN-756) (Jacobs 2024d).

5.3 Regulatory Setting

This section provides an overview of federal, state, and local cultural resource regulations.

5.3.1 Federal

There is one federal regulation that is applicable to the Proposed Project related to cultural resources, which is discussed in the following subsection.

5.3.1.1 National Historic Preservation Act

The NHPA, as amended (54 U.S.C. 300101 - 307108), and its implementing regulations, Protection of Historic Properties (36 CFR 800), requires federal agencies to consider the effects of their actions on historic properties for any federal undertaking. Historic properties are defined as those that are listed on the NRHP or meet certain criteria that render them eligible for listing in the NRHP. An effect on a historic property is "an alteration to the characteristics of a historic property qualifying it for inclusion or eligibility for the NRHP" (36 CFR 800.16).

5.3.2 State

There are two state regulations that are applicable to the Proposed Project related to cultural resources, which are discussed in the following subsections. AB 52 and associated outreach to tribes are covered in Section 18 (Tribal Cultural Resources).

5.3.2.1 CRHR and CCR Sections 15000 to 15387

A historical resource is defined as one that is listed in, or eligible for listing in, the CRHR (which includes resources listed on the NRHP); included in a local register of historical resources; or determined by a lead agency to be significant. An effect that may cause a substantial adverse change in the significance of a historical resource is considered a significant effect on the environment (*California Code of Regulations* [CCR], Title 14, Division 6, Chapter 3, Sections 15000–15387). CEQA requires determining whether the Proposed Project would cause a substantial adverse change in the significance of a historical resource.

The CCA (Article 5, Section 30244) states that, "where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required."

5.3.2.2 PRC Section 5097.5

Section 5097.5 (Archaeological, Paleontological and Historical Site Protection) states that no person may knowingly and willfully excavate, remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or paleontological site

(including fossil footprints, rock art, inscriptions, or other cultural features) located on public lands, unless expressly authorized by the managing public agency.

5.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to cultural resources, which is discussed in the following subsection.

5.3.3.1 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policies that apply to the Proposed Project area:

- **GOAL HAR-1 Historical Resource Protection**. Identify and protect archaeological and historical resources as major contributors to quality of life and community vitality in Marin County.
- **Policy HAR-1.3 Avoid Impacts to Historical and Archaeological Resources**. Ensure that human activity avoids damaging cultural resources, where feasible.

5.4 Impact Analysis

The assessment of cultural impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

Construction and operation of the Proposed Project would have less than significant impacts to the historic properties within the APE. The SHPO was consulted on July 23, 2024, and consultation concluded on August 29, 2024. The Proposed Project would not diminish the features, characteristics, and attributes that qualify these resources for inclusion on the NRHP/CRHR. The Proposed Project would not cause a substantial adverse change in the significance of a historical resource. AMM CULT- through AMM CULT-4 would provide protective fencing to avoid and/or minimize inadvertent impacts and protocol for stopping work if archaeological or cultural resources are inadvertently encountered.

The following list includes the historic properties and Proposed Action impacts to historic properties:

- Dipsea Trail (Panoramic Highway to Redwood Creek Section) (P-21-000493): No improvements to the trail are included in the Proposed Project. Temporary impacts to the trail could occur during construction because of its proximity to Muir Woods

Road. Construction and operation of the Proposed Project would have a less than significant impact to this resource.

- Brazil's Dairy Ranch (P-21-000483/CA-MRN-552H) (built and archaeological components): No improvements would occur within this resource, and the wooden fence that separates the property from the Muir Woods Road ROW would be protected in place. Construction and operation of the Proposed Project would have no impact to this resource.
- Muir Woods Inn Complex (P-21-000495/CA-MRN-568H) (built and archaeological components): No improvements would occur within this resource. Construction and operation of the Proposed Project would have no impact to this resource.
- Mid-20th century bottle and can scatter (P-21-0002875/CA-MRN-723H): No improvements would occur within the previously mapped site. The Proposed Project would have no impact to this resource.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

Archaeological testing conducted for the Proposed Project indicated that there is low sensitivity for buried resources within the APE.

It was determined, and the SHPO concurred, that construction and operation of the Proposed Project would have no impacts to archaeological resources within the APE. SHPO was notified of this determination on July 23, 2024, and the SHPO concurred on August 29, 2024. This reflects the conclusion that the Proposed Project would not diminish the features, characteristics, and attributes that qualify these resources for inclusion on the NRHP/CRHR. The Proposed Project would not cause a substantial adverse change in the significance of an archaeological resource. Construction and operation of the Proposed Project would have a less than significant impact due to change to an archaeological resource. AMM CULT-1 and AMM CULT-2 would provide protective fencing to avoid and/or minimize inadvertent impacts, and AMM CULT-3 and AMM CULT-4 would address unanticipated discoveries during construction. The following are Proposed Project impacts to archaeological resources that support this determination.

- Brazil's Dairy Ranch (P-21-000483/CA-MRN-552H) (built and archaeological components): No improvements would occur within this resource, and the wooden fence that separates the property from the Muir Woods Road ROW would be protected in place. Construction and operation of the Proposed Project would have no impact to this resource.
- Muir Woods Inn Complex (P-21-000495/CA-MRN-568H) (built and archaeological components): No improvements would occur within this resource. The inn and remaining character-defining features of the site are outside the APE. There is very low potential for historically significant buried archaeological resources to be present

within the APE. Construction and operation of the Proposed Project would have no impact to this resource.

- Mid-20th century bottle and can scatter (P-21-0002875/CA-MRN-723H): No improvements would occur within the previously mapped site. Construction and operation of the Proposed Project would have no impact to this resource.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Results of the archaeological survey indicate that it is unlikely that buried human remains are present within the APE, and the APE does not encompass any formal cemeteries. Muir Woods Road has undergone previous and repeated construction and maintenance during operation. It is unlikely that construction and operation of the Proposed Project would encounter or disturb human remains. If human remains were to be discovered during construction, AMM CULT-4 would be implemented to avoid and/or minimize impacts. Construction and operation of the Proposed Project would have a less than significant impact.

5.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measures would be implemented to avoid and/or minimize impacts on cultural resources:

- **AMM CULT-1**: Encroachment on the Dipsea Trail (P-21-000493/CA-MRN-566H), Brazil's Dairy Ranch (P-21-000483/CA-MRN-552H), and the mid-20th century bottle and can scatter (P-21-0002875/CA-MRN-723H) would be avoided during construction. To achieve this, Proposed Project plans would specify that these resources are environmentally sensitive areas and delineate fencing to be placed around these resources to designate them as no-work areas.
- **AMM CULT-2**: A WEAT would be conducted prior to the beginning of construction. The WEAT would identify environmentally sensitive area fencing that defines no-work areas; environmental regulations that prohibit unauthorized disturbance to, or removal of, cultural resources on public land; and explanation of protocol if an inadvertent discovery occurs.
- **AMM CULT-3**: If unidentified cultural materials are unearthed during construction, work in the area of the find (typically at least within 100 feet) would be halted until a qualified archaeologist can assess the significance of the find. If the County determines, based on recommendations from a qualified archaeologist and in consultation with the Federated Indians of Graton Rancheria (if the resource is Native American related), that the resource may qualify as a historical resource or unique archaeological resource (defined in 2025 State CEQA Guidelines Section 15064.5) or a tribal cultural resource (defined in PRC Section 21080.3), the resource would be avoided, if feasible. If avoidance is not feasible, the County would work with a

qualified archaeologist and a Federated Indians of Graton Rancheria representative (if the resource is Native American related) to determine treatment measures to avoid, minimize, or mitigate any potential impacts or adverse effects to the resource. This would include documentation of the resource and may include data recovery, if deemed appropriate, or other actions such as treating the resource with culturally appropriate dignity and protecting the cultural character and integrity of the resource.

- **AMM CULT-4**: If human remains are discovered during construction, further disturbances and activities would cease in the area of the discovery or any nearby area (typically at least within 100 feet) suspected to overlie remains and that the Marin County Coroner must be contacted, as required under *California Health and Safety Code*, Division 7: Dead Bodies, Section 7050.5(b). Pursuant to Section 7050.5(c), if the remains are thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC), who then would notify the Most Likely Descendant.

5.6 Mitigation Measures

No mitigation is required for cultural resources.

6 ENERGY

Would the Proposed Project:

Question	CEQA Determination
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	Less than Significant Impact
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	No Impact

6.1 Methodology

For transportation projects, energy consumption is primarily attributed to vehicle fuel consumption during construction and the fuel consumed by vehicles utilizing the facility. This analysis focuses on the energy (fuel) utilized and consumed during the construction and operational phases of the Proposed Project.

6.2 Environmental Setting

Most of the Proposed Project is within Mount Tamalpais State Park, with small portions in MWNM at the northern end of the Proposed Project and GGNRA at the southern end (Figure 1). Most of the corridor and the surrounding area is undeveloped natural and zoned by Marin County as OA (*Marin County Code* Title 22, Development Code), which is intended for open space uses, as well as environmental preservation, and lacks substantial residential and commercial developments. Most energy use within and surrounding the Proposed Project area results from operating recreational motor vehicles and the small number of buildings present, and maintenance activities within the Mount Tamalpais State Park, GGNRA, and MWNM.

6.3 Regulatory Setting

This section provides an overview of federal, state, and local energy regulations.

6.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to energy.

6.3.2 State

There are two state regulations that are applicable to the Proposed Project related to energy, which are discussed in the following subsection.

6.3.2.1 PRC Section 21100(b)(3) and CEQA Section 15126.2(b)

State regulations under PRC Section 21100(b)(3) and 2025 State CEQA Guidelines Section 15126.2(b) mandate the analysis of a project's energy use to determine whether it may result in negative impacts due to wasteful or unnecessary energy consumption.

6.3.3 *Local*

There is one local regulation that is applicable to the Proposed Project related to energy, which is discussed in the following subsection.

6.3.3.1 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policies that apply to the Proposed Project area:

- **GOAL EN-1 Decreased Energy Use**. Reduce total and per-capita nonrenewable energy waste and peak electricity demand through energy efficiency and conservation.

6.4 Impact Analysis

The assessment of energy impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

The Proposed Project includes physical roadway improvements and a bridge replacement to improve safety and meet current design standards. By rehabilitating the pavement, replacing the existing bridge, improving drainage, and stabilizing slopes, the proposed improvements would reduce the ongoing and future road maintenance projects and thereby reduce future energy consumption during operation.

The Proposed Project would consume energy (gasoline and diesel engines related to equipment) during construction and would not result in substantial consumption. Construction would not significantly impact energy consumption. Construction of the Proposed Project would have a less than significant impact.

The Proposed Project would not impact energy resources during operation. The Proposed Project would not waste, inefficiently use, or unnecessarily consume energy resources. Operation of the Proposed Project would have a less than significant impact.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The Proposed Project includes roadway and bridge improvements only and does not include installing renewable energy, and there are limited options for using renewable energy sources for activities during construction. Operation of the Proposed Project (such as vehicular and recreational use of Muir Woods Road and the bridge replacement) would not conflict with renewable energy initiatives and could be considered to result in a beneficial impact because a rehabilitated road surface and bridge that meet current design and safety standards could improve the use of the area by cyclists and equestrians. The Proposed Project would not conflict with or obstruct state or local plans for renewable energy or energy efficiency. Construction and operation of the Proposed Project would have no impact.

6.5 Avoidance and/or Minimization Measures

No avoidance and/or minimization measures are required for energy resources.

6.6 Mitigation Measures

No mitigation is required for energy resources.

7 GEOLOGY AND SOILS

Would the Proposed Project:

Question	CEQA Determination
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	N/A
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? Refer to Division of Mines and Geology Special Publication 42.	No Impact
ii) Strong seismic ground shaking?	Less than Significant Impact
iii) Seismic-related ground failure, including liquefaction?	Less than Significant Impact
iv) Landslides?	Less than Significant Impact
b) Result in substantial soil erosion or the loss of topsoil?	Less than Significant Impact
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	Less than Significant Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the *Uniform Building Code* (1994), creating substantial direct or indirect risks to life or property?	Less than Significant Impact
e) 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
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Less than Significant Impact

7.1 Methodology

The study area for geology and soils consists of the construction limits for the Proposed Project. This generally consists of a 50-foot-wide corridor centered on the existing roadway, which expands to a 200-foot width where the bridge replacement and road realignment are proposed.

A geotechnical investigation of the study area was completed in 2016, and a geologic hazards assessment was completed in 2019 (Yeh and Associates 2016, 2019). The investigation involved data review, field reconnaissance, laboratory testing, and engineering analyses. Information on study area soils from the geotechnical

investigation was supplemented by data obtained from the USGS geologic map/data available for parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma counties (USGS 2000), and the NPS (NPS 2016a, 2016b, 2016c).

7.2 Environmental Setting

7.2.1 Geology

Most of Muir Woods Road falls in the alluvium (stream deposits) (Quaternary) surficial deposits category, with the land outside the roadway consisting of "mélange" (rock that is characterized by fragments and blocks of various sizes embedded in finer-grained material) (Yeh and Associates 2019). The following geologic units are within the study area (NPS 2016a, 2016b, 2016c):

- Franciscan Complex, mélange (Cretaceous and Jurassic)
- Alluvium (Quaternary)
- Franciscan Complex, chert and metachert (metamorphosed chert) (Cretaceous and Jurassic)

The Alluvium and Franciscan Complex mélange geologic units have the potential to contain fossils (NPS 2016c), although it is likely that the Society of Vertebrate Paleontology (SVP 2010) and Probable Fossil Yield Classification (BLM 2016) methodologies would classify all the geologic units in the study area as "Low Potential" and "Class 3 Moderate" for presence of fossils, respectively. The Geologic Resources Inventory Report (NPS 2016c) notes that, although macrofossils (fossils that can be observed with the unaided eye) have been documented in Franciscan Complex mélange deposits, they are rarely discovered. In summary, the potential exists for fossils to be discovered during earth-moving operations, particularly in areas that have not been previously disturbed, although the likelihood is low.

7.2.2 Seismicity and Alquist-Priolo Earthquake Fault Zones

The study area is in a seismically active portion of California, but it is not within a designated Alquist-Priolo Earthquake Fault Zone. The fault closest to the study area is an unnamed thrust fault approximately 1.5 miles northwest of the study area. A potentially active unnamed fault is approximately 2 miles southwest of the study area, and the active San Andreas fault is approximately 3.1 miles to the southwest (Yeh and Associates 2019). An identified fault runs through Bolinas, which is approximately 5 miles northwest of the study area (CDC 2023b).

7.2.3 Liquefaction

Liquefaction is a process by which water-saturated sediment temporarily loses strength and acts as a fluid during an earthquake. The study area is not in an area historically known for seismic liquefaction (CDC n.d.). Marin County's MarinMap (Marin County

2019b) online mapping tool and results of geotechnical investigations indicate that the soil types in the study area are not typically susceptible to liquefaction.

7.2.4 Landslides

The hills and mountain sides in the study area are composed of Franciscan rocks, which have a tendency for landslides. While portions of the study area are categorized as having the potential for "few landslides," the study area is not underlain by large-scale landslide or debris flows (Yeh and Associates 2019). Soils present in the study area may be susceptible to erosion when disturbed on graded slopes or when exposed by excavations. The Redwood Creek flows and storm-related high-water levels have eroded and undermined roadway embankment slopes in several locations along the corridor.

7.2.5 Expansive Soils

Expansive soils have the ability to undergo substantial changes in volume—shrinking or swelling—from a change in soil moisture. As a result, the ground surface can subside and collapse. As discussed in Section 2 (Agriculture and Forestry Resources), Blucher-Cole complex soil is present in 63 percent of the study area. This soil type has the potential for shrinking/swelling. The geotechnical investigations also identified areas along Muir Woods Road within the study area where subsidence has occurred and areas where the outer several feet of the existing embankment fill has settled, resulting in slope failure. This appears to be associated with poor compaction of fill placed during previous road widening. (Yeh and Associates 2019)

7.3 Regulatory Setting

This section provides an overview of federal, state, and local geology and soil regulations.

7.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to geology and soils.

7.3.2 State

There is one state regulation that is applicable to the Proposed Project related to geology and soils, which is discussed in the following subsection.

7.3.2.1 Alquist-Priolo Earthquake Fault Zoning Act of 1972

CEQA requires a lead agency to analyze potential impacts to geology and soils, as well as risks that certain geologic and soil conditions may pose to the Proposed Project. The Alquist-Priolo Earthquake Fault Zoning Act of 1972 provides legislation intended to

reduce damages resulting from surface fault rupture on a statewide basis. The main purpose of the act is to categorize zones around active faults to prevent the construction of structures for human occupancy overactive faults.

7.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to geology and soils, which is discussed in the following subsection.

7.3.3.1 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policy that applies to the Proposed Project area:

- **EH-2.1 Avoid Hazard Areas.** Require development to avoid or minimize potential hazards from earthquakes and unstable ground conditions.

7.4 Impact Analysis

The assessment of geology and soils impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) 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? Refer to Division of Mines and Geology Special Publication 42.

The study area is not within a designated Alquist-Priolo Earthquake Fault Zone, and known earthquake faults are between 1.5 and 5 miles from the study area (Yeh and Associates 2019; CDC 2023b). The potential for a fault rupture to impact the Proposed Project is low, and no design measures are required to specifically address fault rupture (Yeh and Associates 2019). The Proposed Project is not expected to expose people or structures to adverse effects as a result of a known earthquake fault. Construction and operation of the Proposed Project would have no impact.

ii) Strong seismic ground shaking?

The study area is within a seismically active part of California. Known earthquake faults are between 1.5 to 5 miles from the study area (Yeh and Associates 2019; CDC 2023b). The potential for fault rupture to impact the Proposed Project is low, and no design measures are required to specifically address fault rupture or ground shaking. The Proposed Project would not expose people or structures to adverse effects as a result

of a known earthquake fault and strong seismic ground shaking. Construction and operation of the Proposed Project would have a less than significant impact.

iii) Seismic-related ground failure, including liquefaction?

The study area is not in an area historically known for seismic liquefaction, and the alluvium in the area has a low potential to be underlain by soil that is vulnerable to liquefaction (CDC n.d.; Marin County 2019a). Geotechnical investigations would be completed to support final design of the Redwood Creek bridge replacement, and geotechnical borings would be assessed for liquefaction potential. If potentially liquefiable soils are identified, geotechnical recommendations for design and AASHTO and Caltrans design methods would be followed to reduce the risk posed by these soils.

Because no known potentially liquefiable soils are present within the study area, and standard practices are available to reduce the risk associated with liquefaction, construction and operation of the Proposed Project would have a less than significant impact regarding seismic-related ground failure, including liquefaction.

iv) Landslides?

The hills and mountain sides in the vicinity of the Proposed Project are composed of rock that has a tendency for landslides to occur, but the study area is not within an area underlain by large-scale landslide or debris flows (Yeh and Associates 2019).

Excavation to support the proposed improvements would not occur in areas of a known landslide or adverse geologic conditions that would require mitigation. The potential for landslide or slope instability within the study area is considered low. Because the study area is in an area of low risk for landslides, and both standard management and design measures are available to avoid and/or minimize risk associated with landslide, construction and operation of the Proposed Project would have a less than significant impact regarding landslides.

b) Result in substantial soil erosion or the loss of topsoil?

Soil within the study area may be temporarily susceptible to erosion during construction when disturbed on graded slopes or when exposed by excavation. Proposed improvements would largely be contained within the existing roadbed and shoulders and would not substantially increase the potential for soil erosion or loss of topsoil. Erosion control measures have been incorporated into the Proposed Project in AMM BIO-9 to improve the stability of cut-and-fill slopes for road improvements. Topsoil removed would be conserved, stockpiled, and placed back on finished slopes. Construction and operation of the Proposed Project would have less than significant impacts to soil erosion and loss of topsoil.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Proposed Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Soil types in the study area are not considered unstable and are not prone to collapse or subsidence. Slope failures have occurred along the corridor, but these have been attributed to proximity to Redwood Creek or poor subgrade compaction. The study area is also not within an area underlain by large-scale landslide or debris flows (Yeh and Associates 2019) and the risk of landslides is considered low.

As part of the Proposed Project, poorly compacted soil would be removed and replaced with properly compacted fill, and slopes would be stabilized in areas where failures or subsidence have occurred. Both standard management and design measures have been incorporated into the Proposed Project to avoid and/or minimize the risk associated with these conditions. Construction and operation of the Proposed Project would have a less than significant impact.

d) Be located on expansive soil, as defined in Table 18 1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

The Cole soil type present in the study area has the potential for shrink/swell capabilities. This issue would be addressed by current design standards and standards of practice that have been incorporated into the Proposed Project. The potential for expansive soils to create substantial direct or indirect risk to life or property is considered low. Construction and operation of the Proposed Project would have a less than significant impact.

e) 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?

The Proposed Project does not include a septic tank or alternative wastewater disposal systems. Construction and operation of the Proposed Project would have no impact.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No unique geologic features have been identified within the study area. The study area contains geologic deposits that have the potential to contain fossils and the potential exists for fossils to be discovered during temporary earth-moving operations, particularly in areas that have not been previously disturbed. The likelihood of occurrence is considered low and AMM GEO-1 would be implemented in the event of an inadvertent discovery of paleontological resources to avoid and/or minimize impacts. Given the low likelihood of encountering paleontological resources, and that there are no known unique paleontological resources, sits, or geologic features within the study area,

construction and operation of the Proposed Project would have a less than significant direct or indirect impact.

7.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measure, in addition to AMM BIO-9, which would maintain erosion control measures, would be implemented to avoid and/or minimize impacts on geology and soils:

- **AMM GEO-1:** If paleontological remains or specimens are inadvertently encountered during construction, construction would be suspended at the discovery site. A qualified paleontologist to evaluate the findings and determine appropriate course of action. No work would proceed at the discovery site until approved.

7.6 Mitigation Measures

No mitigation is required for geology and soils.

8 GREENHOUSE GAS EMISSIONS

Would the Proposed Project:

Question	CEQA Determination
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than Significant Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	Less than Significant Impact

8.1 Methodology

GHGs encompass a variety of gases, both occurring naturally and resulting from human activities. These gases include carbon dioxide (CO_2), methane, nitrous oxide, hydrochlorofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The most significant contributor to GHG emissions is CO_2, largely stemming from fossil fuel combustion. The quantities of other gases are measured in relation to CO_2 using a metric known as the CO_2 equivalent.

GHG emissions are different from criteria air pollutants because their impacts in the atmosphere are global rather than local, and also because they remain in the atmosphere for decades to centuries, depending on the gas.

GHG emissions were calculated for construction of the Proposed Project using CalEEMod. Section 3 (Air Quality) provides more details on the emission calculation methods for the Proposed Project.

The Air District has adopted *CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans* (Air District 2022). These thresholds apply to activities during operation, and a project needs to comply with the requirements. There is no construction-related climate impact threshold at this time.

8.2 Environmental Setting

Climate change refers to the long-term alterations in the planet's regular weather patterns, encompassing factors such as wind patterns, storm intensity, precipitation, and temperature, both on a global and regional scale. Throughout history, the planet has undergone natural climate variations. There is a widespread consensus that the current rate of climate change is unprecedented and will continue to accelerate in the foreseeable future. This rapid change is primarily attributed to the buildup of heat-trapping GHG emissions through the burning of fossil fuels and other human activities. GHG accumulation in the atmosphere influences the long-term range of average atmospheric temperatures.

The impacts of climate change in the Bay Area include warmer temperatures, more extreme weather, more variable precipitation patterns, and sea level rise. This increase in the number of climate-related impacts human health, natural systems, infrastructure and agriculture as the planet gets hotter.

In the Bay Area, CO_2 accounts for 90 percent of total GHG emissions on a CO_2-equivalent basis resulting from transportation, stationary sources, energy, and building sectors (Air District 2017a).

8.3 Regulatory Setting

This section provides an overview of federal, state, and local GHG emission regulations.

8.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to GHG emissions.

8.3.2 State

There are three state regulations that are applicable to the Proposed Project related to GHG emissions, which are discussed in the following subsections.

8.3.2.1 California Global Warming Solutions Act of 2006 (AB 32) and California Climate Crisis Act (AB 1279)

In 2006, the California Global Warming Solutions Act of 2006 (Assembly Bill [AB 32]) was passed to create a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required the CARB to develop a Scoping Plan outlining an approach that California would take to reduce GHG emissions to 1990 levels by 2020. The Scoping Plan must be updated every 5 years and builds upon each previous Scoping Plan with new strategies and recommendations. EO B-30-15 established an interim GHG reduction goal of 40 percent below 1990 levels by 2030, and requires state agencies to factor climate change into all planning and investment decisions. The 2022 Scoping Plan (CARB 2022) lays out a path to achieve targets of carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels no later than 2045 as directed by AB 1279.

8.3.2.2 SB 743 Vehicle Miles Traveled

California Senate Bill (SB) 743 was signed into law in 2013 and implemented in 2018 through the adoption of the 2018 State CEQA Guidelines, with the goal of better measuring the actual transportation-related environmental impacts of any given project. Agencies are required to consider the amount of driving, as measured by VMT, when

identifying and mitigating transportation impacts. This approach better aligns the CEQA analysis process with state climate, air quality, and GHG reduction goals.

8.3.2.3 Air District CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans

Guidance for the determination of significant climate impacts within Marin County is found in the document titled *CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans* (Air District 2022). These guidelines assist local agencies in evaluating climate impacts of the Proposed Project consistent with CEQA requirements.

8.3.3 Local

There are three local regulations that are applicable to the Proposed Project related to GHG emissions, which are discussed in the following subsections.

8.3.3.1 Air District Regulation 13

The Air District is responsible for establishing rules and regulations to reduce emissions of climate pollutants in the Bay Area. Regulation 13 (Climate Pollutants) supports one of the primary goals of the 2017 Clean Air Plan to protect the climate and reduce Bay Area GHG emissions to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050.

8.3.3.2 Marin County Unincorporated Area Climate Action Plan 2030

The *Marin County Unincorporated Area Climate Action Plan 2030* (Marin County 2020) was developed to better understand how the community contributes to climate change, set targets to reduce these contributions by a certain year, and outline a path for meeting this goal. The Climate Action Plan was developed in partnership with the local community. In 2017, the Marin County Board of Supervisors launched Drawdown: Marin to engage the community and identify actions to reduce GHGs. The GHG goals for Drawdown: Marin, which were incorporated into the Climate Action Plan, include (1) reduce emissions 60 percent below 2005 levels by 2030 (equivalent to 53 percent below 1990 levels) and (2) drawdown GHG emissions to below zero by 2045 (Marin County 2020).

8.3.3.3 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policy that applies to the Proposed Project area:

- **AIR-4.2 Foster the Absorption of Greenhouse Gases.** Foster and restore forests and other terrestrial ecosystems that offer significant carbon mitigation potential.

8.4 Impact Analysis

The assessment of GHG emission impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The Proposed Project would not increase the overall capacity of Muir Woods Road. No new operational GHG impacts are anticipated from this project because it involves improvements to an existing roadway. The enhancements are intended to improve safety, functionality, and overall community benefit. Any GHG emissions associated with the roadway's use are already accounted for in the existing baseline conditions, given the pre-existing nature of the road. Permanent GHG emissions are not anticipated during operation.

Activities during construction are a temporary source of GHG emissions and result from use of heavy equipment during land clearing, ground excavation, cut-and-fill, paving, and roadway reconstruction. GHG emissions can vary from day to day, depending on the level of activities, the specific operations, and the prevailing weather. Construction is expected to last no more than 14 months. GHG emissions would be generated by using on-road haul trucks, worker commute vehicles, and off-road heavy equipment. Table 8-1 summarizes the estimated GHG emissions during construction.

Table 8-1. Muir Woods Estimated GHG Emissions

Proposed Project Year	Equivalent Emissions Per Phase (metric tons/phase)
2027	599.4
2028	236.6
Total per construction	**836.0**

Source: CalEEMod, Version 2022.1

GHG emissions from construction of the Proposed Project would have a less than significant impact.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The Proposed Project would improve roadway and drainage features resulting in less maintenance and a reduction in vehicular accidents within this area during operation. This would have GHG benefits from smoother pavement surfaces. The Proposed Project would also foster the absorption of GHGs, as large trees removed that are

subject to permitting requirements will be mitigated and replaced at a ratio determined through agency consultation as described in MM BIO-4, and therefore reduce the emissions of GHGs. It is anticipated that trees would be replaced at a minimum of 1:1 ratio or greater. The reduction in GHGs from the Proposed Project would be consistent with California's 2017 Climate Change Scoping Plan (CARB 2017) and would not conflict with the GHG reduction targets set forth in AB 32. The Proposed Project would also be consistent with the strategies in the Bay Area 2017 Clean Air Plan (Air District 2017a) by improving the transportation infrastructure and Marin County Clean Air Plan 2030 (2020). Construction and operation of the Proposed Project would have a less than significant impact.

8.5 Avoidance and/or Minimization Measures

The Air District has not established GHG thresholds of significance for emissions during construction. Control measures to avoid and/or minimize GHG emissions during construction are not required. BMPs have been incorporated into the Proposed Project and would be implemented to avoid and/or minimize emissions for criteria pollutants and precursors that would avoid and/or minimize GHG emissions during construction. These BMPs are listed in AMM AIR-1 and AMM AIR-3 through AMM AIR-8, as discussed in Section 3.5 (Air Quality Resources – Avoidance and/or Minimization Measures), which would avoid and/or minimize impacts to GHGs to a less than significant level.

8.6 Mitigation Measures

No mitigation is required for GHG emissions.

9 HAZARDS AND HAZARDOUS MATERIALS

Would the Proposed Project:

Question	CEQA Determination
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	Less than Significant Impact
b) 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?	Less than Significant Impact
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	No Impact
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to *Government Code* Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	No Impact
e) For a project located within 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, would the Proposed Project result in a safety hazard or excessive noise for people residing or working in the Proposed Project area?	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	No Impact
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	Less than Significant Impact

9.1 Methodology

Environmental regulatory records were reviewed for a study area extending 0.5 mile from the Proposed Project corridor to evaluate whether the corridor or nearby properties have faced, or are currently facing, any regulatory actions, fines, or notices of violation for conditions that may pose a risk to the Proposed Project. The following records were reviewed: California Department of Toxic Substance Control Envirostor Database (DTSC 2023), California Environmental Protection Agency Cortese List Data Resources (n.d.), and the EPA My Maps for My Environment (EPA n.d.). In addition to the databases listed above, a GeoSearch Radius Map Report (2019) was ordered and reviewed (Atkins 2019a) that provides available public information within the study area, including standard federal, state, tribal, and local databases.

A site reconnaissance was completed in 2019 to evaluate the corridor for potential hazardous materials concern (Atkins 2019a). Although several years have passed since the site reconnaissance was conducted, no additional site reconnaissance was required because the corridor is mostly undeveloped with little to no change in land use.

9.2 Environmental Setting

No spills, violations, or remediation sites related to hazardous materials were identified within the study area. One site within the study area, MWNM, was identified as a Resource Conservation and Recovery Act (RCRA) small quantity generator of hazardous waste (generates more than 100 kilograms but less than 1,000 kilograms of hazardous waste per month), but no enforcement actions, violations, or spills have been documented. Two other sites were listed in the GeoSearch report within the study area: an alternative fueling station in the visitor parking lot and a former National Pollutant Discharge Elimination System (NPDES) site near Conlon Avenue and Muir Woods Road. Neither site is associated with storage and/or spills of hazardous materials or spills of hazardous materials.

Fueling stations were identified during the site reconnaissance at the Muir Woods visitor center and were observed to be in good condition with no apparent history of leaks (no staining on the ground from uncontained fuel) (Atkins 2019a). Along the corridor, pole-mounted transformers were observed, but they were noted to be intact and in good condition with no evidence of leaking or disrepair. Transformers may contain polychlorinated biphenyls (PCBs) and would require proper handling and disposal if replacement or relocation is required. Various aboveground storage tanks of unknown contents were noted adjacent to the corridor but showed no signs of uncontained discharge on the unit or ground. No evidence of oil staining or illicit hazardous waste disposal were noted during the site reconnaissance within the limits of the corridor (Atkins 2019a).

Due to the age of the bridges over Redwood Creek, they may have painted components containing RCRA metals or asbestos-containing materials. Paint testing would be required if paint waste is generated during demolition. Asbestos surveys would be required prior to demolition activities for the northernmost bridge proposed for replacement.

9.3 Regulatory Setting

This section provides an overview of federal, state, and local hazard and hazardous material regulations.

9.3.1 Federal

There are two federal regulations that are applicable to the Proposed Project related to hazards and hazardous materials, which are discussed in the following subsections.

9.3.1.1 RCRA and Comprehensive Environmental Response and Recovery Act

The federal government regulates hazardous wastes through RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, and by implementing federal regulations in Title 40 of the CFR. Asbestos regulations applicable to structure demolition or renovation are regulated by Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1926.1101 and 29 CFR 1926.62, National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61, Subpart M, and CCR Title 8, Section 1592. The Toxic Substance Control Act, 15 U.S.C. Section 2601, regulates the distribution and use of new or existing chemicals, such as PCBs.

9.3.1.2 U.S. DOT Hazardous Materials Regulations

The U.S. DOT regulates the safe and secure transportation of hazardous materials through the Hazardous Materials Transportation Act. These regulations apply to shipments of hazardous materials by highway in interstate and intrastate commerce. Key requirements include classification of materials into hazard classes; packing according to DOT specifications; marking, labeling, and placarding vehicles and containers; preparing detailed shipping papers; providing emergency response information; and training personnel and implementing security plans. These regulations are codified in 49 CFR Parts 100-185.

9.3.2 State

There is one state regulation that is applicable to the Proposed Project related to hazards and hazardous materials, which is discussed in the following subsection.

9.3.2.1 *California Health and Safety Code* and CCR Title 22, Division 4.5

Hazardous materials and wastes are regulated through the *California Health and Safety Code* and the CCR Title 22, Division 4.5. The California Department of Toxic Substances Control is responsible for the permitting of hazardous materials.

9.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to hazards and hazardous materials, which is discussed in the following subsection.

9.3.3.1 Certified Unified Programs Agency (CUPA)

The Marin County CUPA is responsible for administering and enforcing environmental and emergency management programs. Programs include hazardous materials business plan, hazardous waste generator oversight, and hazardous materials

management/inventory reporting. Marin County's CUPA regulates and inspects facilities, ensuring compliance, and protects public health and safety.

9.4 Impact Analysis

The assessment of hazards and hazardous material impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Solvents, primers, paints, oils, or other materials may be used during construction and may be used during operation for regular maintenance. The transport, use, and disposal of small amounts of hazardous materials could therefore occur. Transport, use, and disposal of hazardous materials during construction and operation would be compliant with applicable regulations. These regulations include RCRA, DOT Hazardous Materials Regulations, and the local CUPA regulations. Hazardous materials would be transported, handled, and stored on site during construction and operation in compliance with applicable hazardous materials regulations. Database review did not identify contaminated soils or groundwater within 0.5 mile of the Proposed Project that would require special handling and disposal.

The Proposed Project includes demolishing and replacing the northernmost bridge over Redwood Creek and replacing bridge railing on the southernmost bridge over Redwood Creek. Both bridges may contain lead-based paint or asbestos-containing material. AMM HM-1 includes requirements for paint testing and AMM HM-2 includes requirements for an asbestos survey and potential removal and disposal requirements.

Pole-mounted transformers were identified along the corridor and may contain PCBs. AMM HM-3 includes the requirements for handling and disposing of PCB-containing transformers.

Although it is acknowledged that hazardous materials may be used for construction and disposed of or transported during construction and operation, their use, disposal, and transportation would have less than significant impacts through adherence to applicable laws and regulations and the implementation of AMM HM-1 for paint testing, AMM HM-2 for asbestos surveys and potential asbestos removal, and AMM HM-3 for disposal of PCBs. Construction and operation of the Proposed Project would have a less than significant impact.

b) 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?

The Proposed Project implementation is not expected to 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. While it is feasible that materials such as solvents, primers, paints, oils, fuel, or others could be released to the environment accidentally and by unintended consequence during construction and operation, compliance with federal, state, and local regulations, in combination with BMPs, would ensure that all hazardous materials are used, stored, and disposed of properly. Where practicable, hazardous materials would be used and stored at least 65 feet away from Redwood Creek and drains to avoid and/or minimize the chances of accidental release to the environment. A spill prevention, control, and countermeasures plan would be implemented during construction as described in AMM HM-4. Construction and operation of the Proposed Project would have a less than significant impact.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Implementation of the Proposed Project would not create any impacts associated with hazardous emissions or handling of acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. There are no existing or proposed schools within 0.25 mile of the Proposed Project site. Construction and operation of the Proposed Project would have no impact due to emissions of hazardous waste within 0.25 mile of a school.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Database review and site reconnaissance did not identify any spills, violations, contaminated soil or groundwater, enforcement actions, or remediation sites related to hazardous materials within the study area. Although MWNM is a small quantity generator of hazardous waste, this site is not included in the list compiled pursuant to *Government Code* Section 65962.5. No enforcement actions, violations, or spills have been documented at this site. Construction and operation of the Proposed Project would have no impact.

e) For a project located within 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, would the Proposed Project result in a safety hazard or excessive noise for people residing or working in the Proposed Project area?

The Proposed Project is not within 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. Construction and operation of the Proposed Project would have no impact from a safety hazard or excessive noise for people residing or working in the Proposed Project area.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The Proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The Proposed Project would be consistent with the goals of the *Marin Countywide Plan* (Marin County 2007), the *Marin County Local Hazard Mitigation Plan* (Marin County Sherriff's Office 2012), and the *Marin Operational Area Emergency Operations Plan* (Marin County Sherriff's Office 2014) through facilitating easier access through the corridor and thereby aiding emergency responders during an incident. Construction and operation of the Proposed Project would have no impact.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

As discussed in Section 20.4 (Wildfire – Impact Analysis), construction of the Proposed Project would not involve large quantities of combustible material that would increase the risk of wildland fires. Any ignition sources and combustible materials would only be used with adequate fire control measures, such as water bowsers, sand, or fire extinguishers. There is the potential for increased risk of wildfire during construction. Fire protection services, including Muir Beach Volunteer Fire Department and Marin County Fire Department (MCFD), are near the corridor. Given the proximity and number of these fire protection services, the risk of an uncontrolled wildland fire during construction is low. Any potential wildland fire could be responded to by these fire stations.

Existing road widths are substandard, varying between 18 feet and 24 feet with narrow shoulders, making it difficult for large vehicles, including emergency response vehicles, to navigate the roadway safely. The already narrow shoulders continue to erode due to slope failures related to the creek's natural and storm-related water levels. Slope failures have reduced the roadway to one travel lane at two locations. The existing substandard roadway and shoulder widths accompanied by slope failures can hinder traffic during necessary evacuations and increase emergency response times in the event of wildland fires.

Operation of the Proposed Project would improve the safety and reliability of emergency access through widening, repairing, rehabilitating, and resurfacing the existing road and replacing the Redwood Creek bridge. Drivers would have increased lines of sight due to the realigned road and a more expansive bridge deck to navigate around stopped vehicles, pedestrians, and bikers. Together, these improvements would reduce existing traffic congestion, allowing quicker and safer evacuations, and would improve the emergency response times in the event of a wildland fire. The Proposed Project would not expose park employees, visitors, and road users, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. Construction and operation of the Proposed Project would have a less than significant impact.

9.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measures would be implemented to avoid and/or minimize impacts from hazards and hazardous materials:

- **AMM HM-1:** Prior to demolition of the northernmost existing Redwood Creek bridge, asbestos surveys would be performed in accordance with federal, state, and local regulations, including OSHA. If asbestos is present, the contractor would remove and dispose of asbestos-containing material in accordance with OSHA regulations. The EPA Region 9 Asbestos National Emission Standards for Hazardous Air Pollutants Coordinator would be notified at least 10 days prior to any asbestos removal project.
- **AMM HM-2:** Lead-based paint testing would be performed on paint waste generated during construction including bridge modifications or demolition. Testing, handling, and disposal of lead-based paint would comply with federal, state, and local regulations. Painted metal components can be recycled if determined free of lead-based paint prior to removal.
- **AMM HM-3:** If pole-mounted transformer equipment is proposed for replacement, PCBs would be managed and disposed of in accordance with the federal, state and local regulations. Any electrical transformer equipment with no label or unknown concentration is assumed to be PCB contaminated and would be managed accordingly.
- **AMM HM-4:** The contractor would implement a spill prevention, control, and countermeasure plan. The plan would address hazardous materials storage, spill prevention, and spill response during construction.

9.6 Mitigation Measures

No mitigation is required for hazards and hazardous materials.

10 HYDROLOGY AND WATER QUALITY

Would the Proposed Project:

Question	CEQA Determination
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	Less than Significant Impact
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Proposed Project may impede sustainable groundwater management of the basin?	Less than Significant Impact
c) 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:	N/A
i) result in substantial erosion or siltation on or off site;	Less than Significant Impact
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;	Less than Significant Impact
iii) 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	Less than Significant Impact
iv) impede or redirect flood flows?	Less than Significant Impact
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	Less than Significant Impact
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less than Significant Impact

10.1 Methodology

The study area used to evaluate impacts related to drainage patterns, wetlands and other waters of the United States, water quality, and floodplains was primarily the construction limits of the Proposed Project, which encompasses the existing roadbed and areas of proposed widening, drainage improvements, bridge replacement and realignment, and slope stabilization. For water quality, the study area was extended downstream along Redwood Creek until it flows beneath CA-1. The study area used to evaluate impacts to groundwater was the broader Redwood Creek watershed.

Water resources within the study area were identified by conducting a desktop review of available information, including the *2020-2022 California Integrated Report* (SWRCB

2022b), Advisory Committee on Water Information groundwater monitoring maps, the Federal Emergency Management Agency Flood Insurance Rate Map panels (FEMA 2017), and Marin County's Map Viewer (2023b). A field survey of aquatic resources within the study area was conducted in July 2020 and November 2021 to identify potential waters of the United States (Jacobs 2022a).

Potential impacts to water resources were identified by considering potential violations to water quality standards, impacts to groundwater supplies, alterations to drainage patterns, risks of pollutant release due to Proposed Project inundation, and conflicts with water quality control or sustainable groundwater management plans.

10.2 Environmental Setting

The study area is within the Tomales – Drakes Bay Watershed (Hydrologic Unit Code 18050005). The dominant hydrologic features within the study area are discussed in Section 4.2.2 (Biological Resources – Waters of the United States and Waters of the State).

The San Francisco Bay Basin (Region 2) Water Quality Control Plan (SWRCB 2023) identifies Redwood Creek as having beneficial uses for agricultural supply, municipal and domestic supply, freshwater replenishment, shellfish harvesting, cold freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, warm freshwater habitat, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. There are no 303(d) designated water bodies in the study area (SWRCB 2022b).

Hydrologic inputs within the study area include direct precipitation and sheet flow runoff from adjacent hillslopes within the surrounding valley. The study area does not have any known aquifers or groundwater basins (ACWI 2023). There are also no sustainable groundwater management plans in place in the study area. While there are no mapped groundwater basins in the study area, the depth to groundwater table within the corridor ranges from approximately 2 feet to 15 feet, with the groundwater table closest to the surface near Redwood Creek.

Most of the study area is within a Zone D flood hazard area (Figure 3-2, FEMA 2017). The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted (FEMA n.d.). Approximately 169 feet of the south part of the study area, from approximately south of Santos Meadow to the study area terminus at CA-1, is within a Zone A flood hazard area associated with Redwood Creek. A Zone A floodplain has a 1-percent annual chance of flooding and is also referred to as the 100-year floodplain (FEMA n.d.).

The study area contains no seiche zones, which are defined as seismically induced water waves that surge back and forth in a partially enclosed basin, and no tsunami inundation zone, which are areas that could be inundated by a series of large ocean

waves (between 10 feet and 100 feet tall) typically caused by earthquakes, underwater landslides, volcanic eruptions, or asteroids (Marin County 2023b).

10.3 Regulatory Setting

This section provides an overview of federal, state, and local hydrology and water quality regulations.

10.3.1 Federal

There are two federal regulations that are applicable to the Proposed Project related to hydrology and water quality, which are discussed in the following subsections.

10.3.1.1 CWA Section 401 Water Quality Certification and Wetlands Program

For projects that impact waters of the United States and therefore require permits under Section 404 of the CWA or Section 10 of the Rivers and Harbors Act, the RWQCB issues CWA Section 401 Water Quality Certifications in conjunction with USACE. The certification ensures that the federal permit will not violate state water quality standards. For activities involving the discharge of "fill" (such as outfall, bridges, riprap, abutments, piers, retaining walls) to waters of the state, the RWQCB issues waste discharge requirements, under the authority of the state's Porter-Cologne Water Quality Act. Every certification issued by the RWQCB is issued concurrently with the waste discharge requirements.

10.3.1.2 CWA Section 402 NPDES Program

The CWA Section 402 NPDES program regulates the discharges of pollutants from point sources into waters of the United States. Under the NPDES program, projects that disturb one or more acre of soil are point sources and require coverage under a NPDES permit. In California, the NPDES program is administered by the SWRCB, which coordinates with and supports the nine RWQCB. The Proposed Project site is within the jurisdiction of the San Francisco Bay RWQCB. The San Francisco Bay RWQCB administers the NPDES program through the CGP and requires development and implementation of an SWPPP to minimize pollutant discharges during construction.

The Proposed Project site is within the Marin Coastal Basin (SWRCB 2022a, 2023). The RWQCB produced the San Francisco Bay Basin (Region 2) Water Quality Control Plan, which "provides a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses in a manner that will result in maximum benefit to the people of California" (SWRCB 2023). The Water Quality Control Plan identifies the beneficial uses for waterbodies, wetland areas, and groundwater basins that provide the basis for establishing water quality objectives and discharge prohibitions to attain those goals (SWRCB 2023).

10.3.2 State

There is one state regulation that is applicable to the Proposed Project related to hydrology and water quality, which is discussed in the following subsection.

10.3.2.1 CCA Sections 30212, 30233, and 30240

As discussed in Section 4.3.2.5 (Biological Resources – CCA Sections 30121, 30233, and 30240, the CCA asserts several measures to protect wetlands, streams, and other aquatic features within the coastal zone.

10.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to hydrology and water quality, which is discussed in the following subsection.

10.3.3.1 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policies that apply to the Proposed Project area:

- **EH-3.2 Retain Natural Conditions**. Ensure that flow capacity is maintained in stream channels and floodplains, and achieve flood control using biotechnical techniques instead of storm drains, culverts, riprap, and other forms of structural stabilization.
- **WR-1.3 Improve Infiltration**. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.
- **WR-1.4 Protect Upland Vegetation**. Limit development and grazing on steep slopes and ridgelines in order to protect downslope areas from erosion and to ensure that runoff is dispersed adequately to allow for effective infiltration.
- **WR-2.1 Reduce Toxic Runoff**. Reduce the volume of urban runoff from pollutants—such as pesticides from homes, golf courses, cleaning agents, swimming pool chemicals, and road oil—and of excess sediments and nutrients from agricultural operations.
- **WR-2.3 Avoid Erosion and Sedimentation**. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities during operation.

10.4 Impact Analysis

The assessment of hydrology and water quality impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

A CWA Section 404 Permit is required for the Proposed Project because of the expected discharge of fill material in waters of the United States, which in turn requires a CWA Section 401 Water Quality Certification as well. The certification ensures that the federal permit will not violate state water quality standards. A total of 0.6 acre of impervious surface would be added, which represents a 7.8-percent increase in impervious coverage from existing conditions. Although increased impervious surfaces may impact groundwater recharge rates and water quality, the Proposed Project's design elements, including stormwater treatment measures, drainage improvements, and slope stabilization, would reduce stormwater runoff and improve water quality. SWPPP implementation, as required by the Construction Stormwater General Permit, would minimize potential temporary water quality impacts during construction.

Groundwater may be temporarily encountered during bridge construction when driving piles. Potential impacts to surface or groundwater quality from urban runoff (such as road oils and agricultural pollutants) would be avoided and/or minimized through discharge requirements identified in AMM WQ-1 and AMM WQ-2. In-water work activities could impact water quality. Implementing BMPs, such as working in low-flow conditions (AMM BIO-38) and isolating the work area from flowing water (AMM BIO-41), would improve infiltration and minimize potential impacts to water quality.

Through implementation of avoidance and/or minimization measures and compliance with all federal, state, and local rules and regulations, permits, and other requirements related to protecting water quality, the Proposed Project would not violate any water quality standards or waste discharge requirements. Construction and operation of the Proposed Project would have a less than significant impact.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Proposed Project may impede sustainable groundwater management of the basin?

The Proposed Project would not directly impact any drinking water supplies or sustainable groundwater management and would not disturb any aquifers. The Proposed Project may result in impacts to the groundwater recharge rates due to increased impervious surfaces. Groundwater may also be temporarily encountered during bridge construction when driving piles; this is not expected to permanently impact

groundwater supplies. Construction and operation of the Proposed Project would have a less than significant impact.

c) 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) result in substantial erosion or siltation on or off site;

Redwood Creek's natural flows and storm-related high-water levels have eroded and undermined Muir Woods Road's embankment slopes in several locations throughout the corridor. The Proposed Project would repair and stabilize up to 10 areas where roadway slope failure has occurred. Proposed slope stabilization methods include biotechnical rockery, RSS, and rock buttresses. Local plants and native seed mix would also be used to revegetate slope repair areas and reduce erosion and sedimentation into Redwood Creek. The Proposed Project, through methods identified above, would protect steep slopes and ridgelines and protect downslope areas from erosion to ensure that runoff is dispersed adequately to allow for effective infiltration. Through avoidance and minimization measures, the Proposed Project would reduce erosion and siltation on and off site, resulting in beneficial impacts to water quality.

Design of the bridge replacement, including location and composition of abutments within Redwood Creek, considered the potential for changes to water flows in the creek as well as the potential for increased erosion and streambed alteration. Operation of the Proposed Project would not impact drainage patterns in the area. Existing drainage patterns would be preserved. Demolishing the existing bridge would restore Redwood Creek's banks to more natural conditions, and the new bridge under the Proposed Project would be outside of Redwood Creek's OHWM. Construction and operation of the Proposed Project would have a less than significant impact.

ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site;

Increased impervious surfaces of approximately 0.6 acre would increase surface runoff. The Proposed Project would implement design measures to prevent concentrated flows of runoff over slopes. Repair or replacement of drainage culverts, and installation of riprap aprons would reduce the potential for increases in surface runoff to result in flooding. The Proposed Project would not substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site. Construction and operation of the Proposed Project would have a less than significant impact.

iii) 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

The Proposed Project would improve drainage by replacing deteriorating and substandard culverts along Muir Woods Road. Designing and installing curbs along Muir Woods Road would improve the direction and velocity of flows for a more controlled delivery to stormwater drainage systems. The Proposed Project would incorporate permanent stormwater treatment measures as feasible, such as biostrips and bioswales, to further reduce stormwater runoff.

Although the Proposed Project would increase impervious surfaces by approximately 0.6 acre beyond the existing paved width (7.8 percent increase), the expanded roadway does not constitute a substantial increase in impervious surfaces and substantial amounts of polluted runoff would not be generated. The Proposed Project would therefore not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial sources of polluted runoff. Construction and operation of the Proposed Project would have a less than significant impact.

iv) impede or redirect flood flows?

The Proposed Project would improve drainage by replacing deteriorating and substandard culverts and reconditioning ditches, which would convey flood flows into the drainage facilities. All culverts would convey a 50-year flood event, while the new Redwood Creek bridge would accommodate a 100-year flood event. Existing drainage patterns would be preserved. During construction, temporary stream diversions may be required during in-water work activities, but any dewatering activities would maintain downstream flows (AMM BIO-40). Construction and operation of the Proposed Project would have a less than significant impact.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?

The corridor is outside of the tsunami inundation and seiche zones. The Proposed Project poses no risk of release of pollutants due to inundation by a tsunami or seiche. Most of the work for the Proposed Project would occur outside of the Zone A flood hazard area and would not have a significant encroachment on the 100-year floodplain. The Proposed Project would not alter the floodplain hydraulics or increase the risk of flooding.

The Proposed Project would not store large quantities of pollutants on site during construction; thus, if a flood were to occur, the release of pollutants into the environment is unlikely. It is also likely that any pollutants would be stored outside of the Zone A flood zone and would have pollution control measures associated with it, thereby reducing the risk or potential for release. Pollutants would not be used during operation, and no risk due to release is anticipated during operation.

Construction and operation of the Proposed Project would have a less than significant impact associated with flooding, seiche, or tsunami and would not risk the release of pollutants due to inundation.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The San Francisco Bay Basin Water Quality Control Plan "provides a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses in a manner that will result in maximum benefit to the people of California" (SWRCB 2023). Construction and operation of the Proposed Project would not conflict or obstruct the Water Quality Control Plan's goals or objectives, and the Proposed Project is not anticipated to impact water quality or the beneficial uses of Redwood Creek identified in the plan. Temporary water quality concerns associated with activities during construction would be avoided or minimized through compliance with all federal, state, and local rules and regulations, permits, and other requirements related to protecting water quality and implementing BMPs. Construction and operation of the Proposed Project would have a less than significant impact.

10.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measures would be implemented to avoid and/or minimize impacts on hydrology and water quality:

- **AMM WQ-1:** The contractor would submit a Notice of Intent to RWQCB for a Construction General Permit for construction stormwater management. The contractor would develop a SWPPP, which would include BMPs to control erosion and reduce the amount of sediment and pollutants entering surface waters.
- **AMM WQ-2:** Any dewatering required would be discharged to an upland location to ensure it does not enter any surface waters or would be disposed of off site.

In addition, refer to AMM HM-4 (Section 9.5 [Hazards and Hazardous Materials – Avoidance and/or Minimization Measures]), which would also ensure the contractor implements a spill prevention, control, and countermeasure plan during construction, and refer to AMM BIO-38, AMM BIO-40, and AMM BIO-41 (Section 4.5 [Biological Resources – Avoidance and/or Minimization Measures]), which include timing restrictions, maintenance of flows, and isolation requirements for in-water work activities.

10.6 Mitigation Measures

No mitigation is required for hydrology and water quality.

11 LAND USE AND PLANNING

Would the Proposed Project:

Question	CEQA Determination
a) Physically divide an established community?	No Impact
b) 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?	No Impact

11.1 Methodology

Land use and zoning data for the study area, which is defined as the construction limits for land use and planning, was obtained from Marin County (2023c).

11.2 Environmental Setting

Most of the 2.4-mile study area lies within unincorporated Marin County. Approximately 0.4 mile of the northern end of the study area lies within MWNM, and approximately 0.7 mile at the southern end lies within GGNRA. The remainder of the study area is within Mount Tamalpais State Park. The last approximately 0.1 mile of the southern end of the study area is within the coastal zone, managed by the California Coastal Commission, and falls within both federal jurisdiction (GGNRA) and state jurisdiction (Mount Tamalpais State Park).

No established communities are within the study area. Two established communities nearest to the study area include the Muir Beach community adjacent to the southern terminus of the Proposed Project at the Muir Woods Road/CA-1 intersection, and the Muir Woods Park community located approximately 0.5 mile north of the northern Proposed Project terminus. No low-income or minority communities are located within or adjacent to the study area (EPA 2023). Muir Woods Road serves as the only through route for residents, park and MWNM employees, and tourists to travel between Mill Valley and the San Francisco Bay Area to the east and Muir Beach and other Pacific Ocean attractions to the west. It may also serve low-income and minority communities outside the study area.

All the land within the study area is zoned OA (Marin County 2023c), with a portion of the southern end of the Proposed Project within an area zoned as coastal OA (CCC1981). The OA zoning is intended for areas within Marin County that are committed to open space uses, as well as environmental preservation (*Marin County Code* Title 22, Development Code). Land adjacent to the roadway corridor is in federal, state, and county ownership.

11.3 Regulatory Setting

This section provides an overview of federal, state, and local land use and planning regulations.

11.3.1 Federal

There is one federal regulation that is applicable to the Proposed Project related to land use and planning, which is discussed in the following subsection.

11.3.1.1 Coastal Zone Management Act of 1972

The CZMA was established to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." The CZMA contains policies similar to the CCA discussed in Section 11.3.2.1 (Land Use and Planning – CCA Section 20008) to protect public access and recreation, environmentally sensitive areas, agricultural lands, and scenic beauty. California participates in the Coastal Zone Management Program established under the CZMA.

11.3.2 State

There is one state regulation that is applicable to the Proposed Project related to land use and planning, which is discussed in the following subsection.

11.3.2.1 CCA Section 20008

California has developed a coastal zone management plan and has enacted the CCA to protect the coastal zone. The policies established by the CCA include the following:

- Protection and expansion of public access and recreation
- Protection, enhancement, and restoration of environmentally sensitive areas
- Protection of agricultural lands
- Protection of scenic beauty
- Protection of property and life from coastal hazards

11.3.3 Local

There are four local regulations that are applicable to the Proposed Project related to land use and planning, which are discussed in the following subsections.

11.3.3.1 GGNRA and MWNM Final General Management Plan/ Environmental Impact Statement

The GGNRA and MWNM Final General Management Plan/Environmental Impact Statement (NPS 2014) includes the following goals:

- Emphasize the preservation of fundamental natural resources that contribute to the significance of each park unit. Manage all other resources to complement the distinctive resources and experiences.
- Provide visitors with opportunities for understanding and enjoying the national park experience.
- Provide visitors with opportunities to explore, learn, and enjoy the park's unique resources and history.

11.3.3.2 Marin Countywide Plan 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policies that apply to the Proposed Project area:

- **Policy WR-2.3 Avoid Erosion and Sedimentation**. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and onsite sediment retention. Require developments to include onsite facilities for the retention of sediments, and, if necessary, require continued monitoring and maintenance of these facilities during operation.
- **TRL-1.1 Protect the Existing Countywide Trail System**. Maintain the existing countywide trail system and protect the public's right to access it.

11.3.3.3 Marin County LCP Land Use Plan

The Marin County LCP Land Use Plan (2019a) is a guide for future development and to assure that coastal resources are properly used and protected in Marin County. This land use plan covers Units 1 and 2 of Marin County's Coastal Zone; the Proposed Project is only partially located in Unit 1 of Marin County's coastal zone (Marin County 2019a). On a map provided by the CCC, the southern end of the Proposed Project is within a categorical exclusion zone (CCC 1981) and zoned as coastal OA.

The following new development and land use policies in the LCP regarding state and federal parklands are applicable to the Proposed Project area:

- The extensive amount of federal parkland within the coastal zone provides significant opportunities for development of coastal access, recreational facilities and visitor support services. Such development opportunities reduce the need to plan for and provide such facilities on the private lands within the coastal zone. The LCP

assumes that a major proportion of the access and visitor service needs within the coastal zone would and can be successfully integrated into federal park development and management programs.

- The development of additional recreational and visitor services on those portions of the Mount Tamalpais State Park within the coastal zone, including hiking trails, equestrian trails, a "primitive" hostel at the Steep Ravine cabins, and improved parking and support facilities at Red Rock are consistent with the LCP policies. Such facilities are to be similar in design, size, and location as those proposed by the Mount Tamalpais State Park Plan. Consistent with protecting significant resources, additional trail development to improve access to public tidelands is encouraged.

11.3.3.4 Coastal Zone Management Act of 1972

As described in Section 1.3.1.1 (Aesthetics – Coastal Zone Management Act of 1972), California participates in the federal Coastal Zone Management Program established under the federal CZMA. The coastal zone excludes “lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal Government, its officers or agents.” While federal lands are excluded from the coastal zone, federal projects that have reasonably foreseeable effects on state coastal zones should be evaluated for consistency with the CCA.

11.4 Impact Analysis

The assessment of land use and planning impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Physically divide an established community?

The Proposed Project primarily consists of restoring and rehabilitating a 2.4-mile segment of Muir Woods Road. The proposed improvements would largely follow the existing road alignment, except at the bridge replacement and approach road realignment. No established communities or low-income or minority communities are present within the corridor. The Proposed Project would not physically divide such communities. Muir Woods Road is the only through route for residents, park and MWNM employees, and tourists to travel between Mill Valley and the San Francisco Bay Area to the east and Muir Beach and other Pacific Ocean attractions to the west. Activities during construction have the potential to result in intermittent travel delays through the corridor and would be avoided and/or minimized with implementing AMM PUB-1 discussed in Section 15.5 (Public Services – Avoidance and/or Minimization Measures). Construction and operation of the Proposed Project would have no impact.

b) 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?

The Proposed Project would be consistent with area plans, policies, and regulations adopted for the purpose of avoiding or mitigating environmental impacts in the following ways:

- It would address existing drainage issues and repair areas of slope failure, reducing erosion and discharge of sediments into Redwood Creek.
- It would provide a consistent road width through the Proposed Project area, repair areas of slope failure, and replace and realign a substandard bridge and road geometry, which would provide a reliable and safe roadway for coast visitors that visit the Mount Tamalpais State Park, MWNM, and other destinations within the coastal zone.
- It would formalize a segment of the Redwood Creek Trail adjacent to the roadway, thereby improving the trail system and providing visitors with enhanced opportunities to explore and enjoy the Mount Tamalpais State Park and MWNM.
- It would improve the Proposed Project area trail system within Mount Tamalpais State Park, portions of which fall within the coastal zone.
- Permanent easements required for ongoing culvert access, inspection, maintenance, and debris removal during operation would not conflict with the OA zoning designation within the Proposed Project area or uses of adjacent land within MWNM, Mount Tamalpais State Park, GGNRA, or the Muir Beach Community Services District.

As described herein, the Proposed Project would be consistent with applicable land use plans, policies, and regulations. Construction and operation of the Proposed Project would have no impact.

11.5 Avoidance and/or Minimization Measures

Refer to AMM PUB-1 (Section 15.5 [Public Services – Avoidance and/or Minimization Measures]), which would minimize travel delays to the public to a less than significant level.

11.6 Mitigation Measures

No mitigation is required for land use and planning.

12 MINERAL RESOURCES

Would the Proposed Project:

Question	CEQA Determination
a) 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?	No Impact
b) 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?	No Impact

12.1 Methodology

The study area for mineral resources includes the area of ground disturbance of activities and a 50-foot-wide corridor centered on the existing roadway, which expands to a 200-foot width where the bridge replacement and road realignment are proposed.

Multiple sources were reviewed to determine whether mineral resources were located within or adjacent to the study area.

The Mineral Resources Data System and the United States Mineral Deposit Database (USGS n.d.) provide data on mineral resources, including mines, prospects, and occurrences of various minerals within the United States and globally (USGS 2011). The State Mining and Geology Board keeps track of important mineral deposits in California. In Marin County, there are eight designated Mineral Resource Preservation (MRP) sites with valuable minerals (Marin County 2007), although the *Marin Countywide Plan* notes that four should be removed from the list because they are used for residential purposes or are environmentally sensitive. Of the eight MRP sites in Marin County, none are within or adjacent to the Proposed Project's study area.

12.2 Environmental Setting

No reports of mineral resources, including mines, prospects, and occurrences are within the study area defined for the Proposed Project (USGS n.d., 2011).

12.3 Regulatory Setting

This section provides an overview of federal, state, and local mineral resource regulations.

12.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to mineral resources.

12.3.2 State

There is one state regulation that is applicable to the Proposed Project related to mineral resources, which is discussed in the following subsection.

12.3.2.1 California Surface Mining and Reclamation Act of 1975

The California Surface Mining and Reclamation Act of 1975 requires counties to adopt policies to protect state-designated mineral resource sites from land uses that preclude or inhibit mineral extraction needed to satisfy the local market demand on a timely basis. The purpose of this act is to ensure that materials will be available to all areas of the state at a reasonable cost (Marin County 2005a).

12.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to mineral resources, which is discussed in the following subsection.

12.3.3.1 Marin Countywide Plan 2007-2020

Local governments have a responsibility to safeguard the health and safety of their residents by allowing only legal mining and material transport activities and enforcing effective avoidance and/or minimization measures by using BMPs (Marin County 2007).

12.4 Impact Analysis

The assessment of mineral resource impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) 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?

The Proposed Project is not within an area determined to have mineral deposits of value to the region and residents of the state, and there are no MRPs along the corridor. Construction and operation of the Proposed Project would have no impact to the availability of mineral resources.

b) 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?

The Proposed Project area is not within a locally important mineral resource recovery site, or a designated MRP. Construction and operation of the Proposed Project would have no impact to mineral resource recovery sites.

12.5 Avoidance and/or Minimization Measures

No avoidance and/or minimization measures are required for mineral resources.

12.6 Mitigation Measures

No mitigation is required for mineral resources.

13 NOISE

Would the Proposed Project result in:

Question	CEQA Determination
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Proposed Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than Significant Impact
b) Generation of excessive ground borne vibration or ground borne noise levels?	Less than Significant Impact
c) 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 two miles of a public airport or public use airport, would the Proposed Project expose people residing or working in the Proposed Project area to excessive noise levels?	No Impact

13.1 Methodology

The study area for noise includes noise-sensitive receptors near the corridor that could be impacted by activities during construction.

- A review of the state and local noise regulations and ordinances was conducted to determine the construction noise and vibration limits and requirements applicable to each Proposed Project location.
- Potential construction noise impacts were assessed that include identifying land uses or activities that may be impacted by noise from construction and determining measures to avoid and/or minimize construction noise impacts.
- Vibration levels were estimated using data from the Caltrans *Transportation and Construction Vibration Guidance Manual* (2020a).
- Vibration levels were compared to Caltrans guidelines for determining potential impacts related to vibration annoyance and structural damage.

13.2 Environmental Setting

The Proposed Project corridor is in a rural area with scattered residential development. Noise-sensitive receptors include residential properties associated with the Muir Beach community adjacent to the southern terminus of the corridor at the Muir Woods Road/CA-1 intersection, residences on Camino del Canyon approximately 700 feet east of the proposed bridge replacement over Redwood Creek, and residences at Kerri Lane approximately 50 feet northwest of Muir Woods Road. Noise-sensitive receptors are also associated with MWNM such as the Muir Woods Education Lab and Muir Woods visitor center near the north end of the corridor.

13.3 Regulatory Setting

This section provides an overview of federal, state, and local noise regulations.

13.3.1 Federal

Federal regulations that are applicable to the Proposed Project related to noise are provided in 23 CFR 772 Procedures for Abatement of Highway Traffic Noise and Construction.

13.3.2 State

There are no state regulations that are applicable to the Proposed Project related to noise; however, Caltrans guidance was used during assessment.

13.3.2.1 Caltrans Transportation and Construction Vibration Guidance Manual

CEQA requires determining whether a temporary increase in ambient noise levels in the vicinity of the Proposed Project is greater than local noise standards or ordinances. CEQA also requires determining whether the Proposed Project would result in excessive groundborne vibration or groundborne noise levels. While the Proposed Project is not under Caltrans jurisdiction, the *Transportation and Construction Vibration Guidance Manual* (Caltrans 2020a) was used to assess groundborne vibration and noise impacts.

13.3.3 Local

There are three local regulations that are applicable to the Proposed Project related to noise, which are discussed in the following subsections.

13.3.3.1 Marin County Noise Technical Background Report

The Marin County *Noise Technical Background Report* (Marin County 2005b) identifies traffic noise as the prevalent source of noise in the county, with U.S. Highway 101 being the main source. Muir Woods Road is outside of both the 60 day-night average sound level (Ldn) and 65 Ldn contour, although CA-1 is classed as being within the 60 Ldn and connects to the southern end of the corridor.

13.3.3.2 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) also sets policies relating to noise, including Policy N-1.3, Regulate Noise Generating Activities. This policy requires measures to avoid and/or minimize noise exposure to neighboring properties, open space, and wildlife habitat from activities during construction.

13.3.3.3 *Marin County Municipal Code*, Title 6, Chapter 6.70

The *Marin County Municipal Code* Title 6 Chapter 6.70 – Loud and Unnecessary Noises, specifies hours of work for noise and use of loud noise-generating equipment during construction. Work is only allowed to be undertaken from 7:00 a.m. to 6:00 p.m. Monday through Friday and from 9:00 a.m. to 5:00 p.m. Saturday. Work is prohibited on Sundays and holidays. Loud noise-generating equipment (such as backhoes, generators, and jackhammers) can be maintained, operated, or serviced at a site from 8:00 a.m. to 5:00 p.m. Monday through Friday. Exceptions can be made for projects for a city, county, state, other public agency, or other public utility.

13.4 Impact Analysis

The assessment of noise impacts is provided in the responses to the following questions.

Would the Proposed Project result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Proposed Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Sensitive receptors near the corridor are between approximately 50 feet and 700 feet from activities. During construction, it is possible that temporary increases in ambient noise levels could be generated in and around the Proposed Project area. Construction would be limited to daytime hours; no nighttime construction would occur. BMPs, such as those in AMM NOI-1 through AMM NOI-3 and AMM BIO-7 would be in place to avoid and/or minimize noise-related impacts. These control measures include using sound control devices such as mufflers, limiting idling time of machinery to 5 minutes or less, limiting the number of concurrently operating pieces of equipment, and notifying local residences of activities in advance. With implementation of these standard control measures and adherence to the *Marin County Municipal Code* noise ordinance, there would not be a substantial temporary increase in ambient noise levels. AMM NOI-1 through AMM NOI-3 would be implemented to avoid and/or minimize these periodic or temporary increases in ambient noise levels to the maximum extent feasible in compliance with the noise ordinance. The public would be provided advance notice in the event that noise levels were to temporarily increase above ambient noise levels. Construction of the Proposed Project would have a less than significant impact.

The Proposed Project would not add capacity, and traffic noise levels would be similar to the existing conditions. The improved pavement condition would reduce noise as vehicles would experience a smoother tire-to-pavement interaction. In addition, the new Redwood Creek bridge would remain at approximately the same distance as the existing bridge from any sensitive noise receptors. Therefore, operation of the Proposed Project would have no impact.

Additionally, the Proposed Project would include minor changes to the road's horizontal and vertical alignment. However, these changes do not meet the definition of substantial vertical (does not remove shielding exposing the line-of-sight between the receptor and the traffic noise source) or horizontal alignment (does not halve the distance between the traffic noise source and the closest receptor) as defined in 23 CFR 772.5. Furthermore, no additional travel lanes are proposed. Therefore, the Proposed Project is classified as a Type III project, and no federal quantitative noise assessment is required.

b) Generation of excessive ground borne vibration or ground borne noise levels?

Equipment operation and other activities could result in temporary groundborne vibration and groundborne noise during construction, particularly during impact or vibratory piling, excavation, and use of large vehicles often used for bridge construction. Vibratory rollers may be used to compact the subgrade and for roadway paving activities that can create groundborne vibration and noise. Impact and vibratory pile drivers and vibratory rollers would be the activity most likely to generate excessive amounts of groundborne vibration and noise. Pile driving is anticipated for replacement of the existing bridge over Redwood Creek; however, pile driving would not occur within the creek channel. The nearest sensitive receptors are on Camino del Canyon approximately 700 feet east of proposed pile-driving operations. The nearest sensitive receptors to vibratory rolling are at Kerri Lane approximately 50 feet west of activities during construction. The noise-sensitive receptors at both locations are residential.

Vibratory motion is commonly described by identifying the peak particle velocity (PPV), which is measured in inches per second, is an indication of the magnitude of energy transmitted through vibration and is used to evaluate the potential for damage and annoyance from vibration-generating activities. The *Transportation and Construction Vibration Guidance Manual* includes formulas to determine the PPV generated by equipment at a given distance. The results of the calculation can be compared to the Guideline Vibration Annoyance Potential Criteria and the Guideline Vibration Damage Potential Threshold Criteria also found in the manual. The results of the calculated PPV at sensitive receptors compared to the annoyance and damage potential are listed in Table 13-1. (Caltrans 2020a)

Table 13-1. Sensitive Receptor Vibration Annoyance and Damage Potential

Sensitive Receptors	Distance	Estimated PPV	Annoyance Potential [a]	Damage Potential [b]
Camino del Canyon	700 feet from pile driving	0.009 inch per second	Barely perceptible	Less than the threshold for damage to residential structures
Kerri Lane	50 feet from vibratory rolling	0.085 inch per second	Distinctly perceptible	Less than the threshold for damage to residential structures

[a] Caltrans Guideline Vibration Annoyance Potential Criteria (Caltrans 2020a)

[b] Caltrans Guideline Vibration Damage Potential Threshold Criteria (Caltrans 2020a)

As presented in Table 13-1, sensitive receptors at Camino del Canyon and Kerri Lane would not experience vibration at levels that would damage residential structures. Receptors at Camino del Canyon would experience vibration annoyance as barely perceptible, whereas receptors at Kerri Lane would experience vibration annoyance as distinctly perceptible. Distinctly perceptible is less than the Caltrans Guideline Vibration Annoyance Potential Criteria of "strongly perceptible" and "severe" that indicates a higher level of impact. Although the annoyance criteria would be distinctly perceptible, the duration of construction at Kerri Lane would last up to 2 weeks. AMM NOI-2 and AMM BIO-35 would be implemented to avoid and/or minimize groundborne vibration and groundborne noise impacts during construction. Construction of the Proposed Project would have a less than significant impact from excessive groundborne vibration and noise.

Operation of the Proposed Project would be similar to existing conditions and would not include groundborne vibration or an increase in traffic-related noise. No new equipment associated with the Proposed Project would be installed. There would be no vibration impacts during operation. Operation of the Proposed Project would have a less than significant impact from excessive groundborne vibration and noise.

c) 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 two miles of a public airport or public use airport, would the Proposed Project expose people residing or working in the Proposed Project area to excessive noise levels?

The closest airport to the corridor is the San Rafael Airport, approximately 9 miles northwest of the corridor. The corridor is not within 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 Project would not expose people residing or working within the vicinity of an airport. Construction and operation of the Proposed Project would have no impact.

13.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measures would be implemented to avoid and/or minimize impacts from noise:

- **AMM NOI-1:** Construction equipment would have mufflers conforming to original manufacturer specifications that are in good working order and are in constant operation to prevent excessive noise or unusual noise.
- **AMM NOI-2:** Public notices would be issued prior to construction regarding the approximate schedule and duration of construction.
- **AMM NOI-3** The distance between stationary noise-generating construction equipment, such as air compressors and portable power generators, and noise-sensitive receptors would be maximized.

In addition, AMM BIO-7 would be employed to minimize idling of construction equipment and vehicles, and AMM BIO-35 would be employed to limit construction operations to daylight hours.

13.6 Mitigation Measures

No mitigation is required for noise.

14 POPULATION AND HOUSING

Would the Proposed Project:

Question	CEQA Determination
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	No Impact
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	No Impact

14.1 Methodology

The Proposed Project's impacts to population and housing were evaluated by considering potential contributions to population growth and socioeconomic impacts and identifying any displacements, including affordable housing residents. The study area used to evaluate impacts to population and housing was unincorporated Marin County. The Proposed Project area was selected because it encompasses the area where potential direct or indirect population growth or socioeconomic impacts could occur within the vicinity of the corridor.

14.2 Environmental Setting

In 2021, Marin County had a total population of 257,774, with 66,888 residents living in unincorporated areas (Marin County 2023e). Between 2010 and 2021, the population of these unincorporated areas decreased by 539. While both unincorporated and incorporated areas of the county saw population growth in the first half of the 2010s, there has been a decline since 2017. From 2020 to 2021, the population in unincorporated areas of Marin County decreased by 2.6 percent, more than twice the overall county's decline of 1.2 percent. The Association of Bay Area Governments projects only a 2 percent population growth in unincorporated areas over the next two decades.

The corridor itself is sparsely populated. It is in an area zoned as OA (Marin County 2023a) and is predominantly managed as recreational land, either by NPS or CDPR. Limited scattered residential development does occur on Camino del Canyon, approximately 700 feet east of the proposed bridge replacement, and at Kerri Lane, approximately 50 feet northwest of Muir Woods Road. Muir Beach south of the Proposed Project area is the closest residential community. Muir Woods Road serves as an alternative to CA-1 to connect the Muir Beach community to Tamalpais Valley and Mill Valley.

14.3 Regulatory Setting

This section provides an overview of federal, state, and local population and housing regulations.

14.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to population and housing.

14.3.2 State

There are no state regulations that are applicable to the Proposed Project related to population and housing.

14.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to population and housing, which is discussed in the following subsection.

14.3.3.1 Marin Countywide Plan 2007-2020

Marin County is responsible for establishing zoning designations that identify appropriate land uses for areas within its jurisdictional limits, including areas zoned for residential uses. The *Marin Countywide Plan* (Marin County 2007) sets goals and objectives for long-term growth and future land use and development within Marin County.

14.4 Impact Analysis

The assessment of population and housing impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Proposed Project does not propose to construct new homes or businesses that would draw additional residents, and improvements to Muir Woods Road would not promote or induce substantial unplanned population growth in the surrounding areas of MWNM. As the Proposed Project would not increase capacity along Muir Woods Road, the Proposed Project would not directly or indirectly generate growth during construction or operation. Construction and operation of the Proposed Project would have no impact.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The entire corridor is zoned as OA and has limited residential properties. The Proposed Project would not require the demolition of housing, displacement of people from existing housing, or construction of replacement housing elsewhere. There are no elements of the Proposed Project that would displace substantial numbers of people or housing. Construction and operation of the Proposed Project would have no impact.

14.5 Avoidance and/or Minimization Measures

No avoidance and/or minimization measures are required for population and housing.

14.6 Mitigation Measures

No mitigation is required for population and housing.

15 PUBLIC SERVICES

Would the Proposed Project:

Question	CEQA Determination
a) 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:	N/A
i) Fire protection?	Less than Significant Impact
ii) Police protection?	Less than Significant Impact
iii) Schools?	No Impact
iv) Parks?	Less than Significant Impact
v) Other public facilities?	Less than Significant Impact

15.1 Methodology

Potential impacts to public services were evaluated through assessing potential hindrances to operate public services, including fire protection, police protection, schools, and parks. The study area used to evaluate impacts to public services included the construction limits for the Proposed Project and the surrounding communities of Muir Beach and Mill Valley. The Proposed Project area was selected because it encompasses the area where the Proposed Project may impact public services within the vicinity of MWNM.

15.2 Environmental Setting

Local fire protection services are provided through the Muir Beach Volunteer Fire Department, which is approximately 1,000 feet southeast of the intersection of Muir Woods Road and CA-1. The corridor is within MCFD's Throckmorton Ridge Station service area (MCFD 2023). Throckmorton Ridge Fire Station is approximately 3.5 miles north of the corridor. The Mill Valley Police Department is the closest police protection service to the corridor, located approximately 5 miles east of the northern terminus of the corridor.

The Mill Valley School District and the Tamalpais Union High School District serve residents within or near the corridor, with the closest public school (Old Mill Elementary) approximately 3.5 miles northeast of the corridor. The Stinson Beach Library District, which is part of the Marin County Free Library system, also serves residents in the

study area. Library services are provided by the Mill Valley Public Library and the Marin City Library. The closest public library to the corridor is Mill Valley Public Library, approximately 3.5 miles to the northeast of the corridor.

Numerous parks and recreational opportunities are located throughout the corridor, including MWNM, GGNRA, Mount Tamalpais State Park, and several trails. As discussed in Section 16.4 (Recreation – Impact Analysis), due to overcrowded conditions and traffic congestion, NPS implemented a reservation system that limits the number of visitors entering MWNM. Muir Beach is also to the south of the Proposed Project area. Adjacent residents and visitors come to these areas to hike, bike, ride horses, and swim.

15.3 Regulatory Setting

This section provides an overview of federal, state, and local public service regulations.

15.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to public services.

15.3.2 State

There are two state regulations that are applicable to the Proposed Project related to public services, which are discussed in the following subsections.

15.3.2.1 California Fire Code

The *California Fire Code* contains regulations to safeguard life and property from fire and explosion hazards; the storage, handling, and use of hazardous materials; and hazardous conditions in the use or occupancy of buildings or premises.

15.3.2.2 State of California Emergency Plan

The *State of California Emergency Plan* establishes how to prepare for, mitigate, respond to, and recover from natural or human-caused emergencies in California (Cal OES 2017).

15.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to public services, which is discussed in the following subsection.

15.3.3.1 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) establishes goals to ensure adequate public services are provided as the population increases within the county (Marin

County 2007). Goals and policies that are applicable to fire-related services are found in Section 20 (Wildfire).

15.4 Impact Analysis

The assessment of public service impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) 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?

The risk of fire could potentially increase during construction due to equipment and vehicles in the area. Construction would not use large quantities of combustible materials or chemicals. Any ignition sources and combustible materials required for the Proposed Project would only be used with adequate fire control measures, such as water tanks, sand, or fire extinguishers. The potential increased risk of fire during construction would not require altering existing or constructing new fire protection facilities, because existing fire protection service is adequate. Construction and operation of the Proposed Project would have a less than significant impact.

ii) Police protection?

An increased demand for police protection services to be provided by the Marin County Sheriff's Office could occur during construction from the increased number of workers in the area, as well as the introduction of an active site in the area. The potential incremental increased demand for police protection services would not substantially increase service ratios or response times, nor would it require altering existing or constructing new facilities. Construction and operation of the Proposed Project would have a less than significant impact.

iii) Schools?

The Proposed Project would not introduce any new residents into the study area that may use school services provided by the Mill Valley School District or the Tamalpais Union High School District. The Proposed Project would not increase demand for school services, nor create the need to construct school facilities. Construction and operation of the Proposed Project would have no impact.

iv) Parks?

The Proposed Project does not include new parks and recreational facilities, although it would formalize the currently undesignated informal trail along the east side of Muir Woods Road in the northern part of the study area. While the improved roadway could potentially attract more people wanting to visit MWNM, the NPS reservation system at MWNM caps the number of visitors at any given time, which ensures that the improvements to Muir Woods Road would not induce a significant number of additional visitors to the area. The Proposed Project would not generate demand for park facilities or increase the use of existing facilities. Construction and operation of the Proposed Project would have a less than significant impact.

v) Other public facilities?

The Proposed Project would not result in any changes to the population during or after construction. While traffic delays may occur during construction, which could impact access to public facilities such as libraries and other recreational resources, these delays would be avoided and/or minimized by implementing AMM PUB-1. The Proposed Project would improve Muir Woods Road, which is a public facility, extend its design life, and improve safety and reliability for users of the roadway during operation. Construction and operation of the Proposed Project would have a less than significant impact.

15.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measure would be implemented to avoid and/or minimize impacts on public services:

- **AMM PUB-1:** At least one lane of traffic would remain open during construction. Delays to public traffic would not exceed 30 minutes. If a delay longer than 30 minutes is anticipated for a specific activity, advance notice would be provided to the public, local agencies, school districts, and emergency service providers. Emergency vehicles would be given priority passage through the construction limits during construction.

15.6 Mitigation Measures

No mitigation is required for public services.

16 RECREATION

Question	CEQA Determination
a) Would the Proposed Project 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?	Less than Significant Impact
b) Does the Proposed Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	Less than Significant Impact

16.1 Methodology

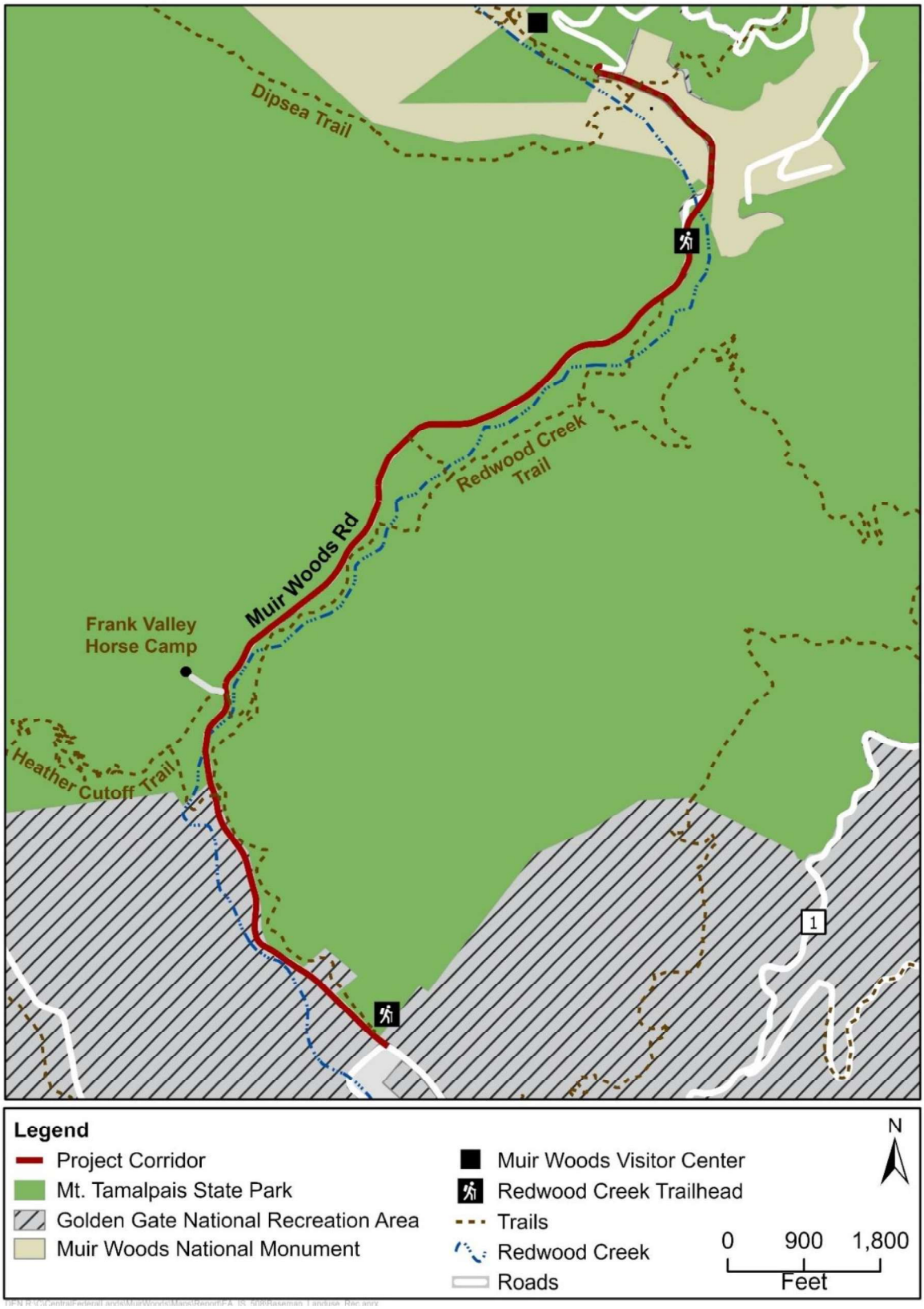
The study area consists of a 500-foot buffer centered on the existing centerline of Muir Woods Road, from the entrance to MWNM to the north and its junction with CA-1 to the south. Existing recreational resources within the study area were identified by conducting a desktop review of readily available information, including the Muir Woods & Vicinity Trail Map (NPS 2019), Mount Tamalpais State Park Brochure (CDPR 2016), CDPR website (CDPR n.d.), and Google Earth aerial imagery. A project scoping site visit was held in May 2015. All data were mapped using GIS.

16.2 Environmental Setting

Three parks, one campground, and three trails in the study area are summarized below and shown on Figure 9.

- GGNRA: A portion of GGNRA falls within the southwest end of the study area. The vast majority of the 82,000-acre GGNRA is south and west of the study area, with slivers adjacent to Muir Woods Road within the study area. The GGNRA contains ecologically and historically important landscapes that surround San Francisco Bay south of the study area. It comprises several noncontiguous areas that stretch from southern San Mateo County to northern Marin County and includes several areas of San Francisco.
- Mount Tamalpais State Park: The entire central portion of the study area falls within this 6,300-acre state park, which is one of the oldest and most popular parks in the California State Parks system. The approximately 2,570-foot-tall Mount Tamalpais is the primary feature of the park. Within the study area, the park offers hiking and horseback riding trails and a campground. The park is open daily year-round from 7:00 a.m. to sunset, with no main entrance fee.

Figure 9. Park and Recreational Facilities Within Study Area



- MWNM: MWNM is in the northern part of the study area and is managed as part of GGNRA. MWNM caters to pedestrians because parking spaces are sparse and only allowed at the park entrance. The park contains 6 miles of trails that wind through old-growth redwood forests (NPS 2023d). The visitor center is at the park entrance north of the study area and includes bathrooms, a café, gift shop, and outdoor benches. The primary recreation activities offered include walking, hiking, and wildlife viewing. MWNM is only open for day use and does not allow picnicking, camping, or pets. Bicycles are only allowed on designated fire roads.

Because of overcrowded conditions and traffic congestion at MWNM, the NPS implemented a reservation system that limits the number of visitors entering MWNM. An Environmental Assessment was prepared for the MWNM reservation system (NPS 2015b) that included evaluating the visitor experience, which revealed that visitors had negative experiences when visiting MWNM, including the following:

- Parking in illegal or unsafe areas
- Visitors walking long distances or in unsafe areas, including in the travel lanes of Muir Woods Road
- Congestion in the parking lots, creating driver frustration
- Crowding in the arrival experience and within MWNM
- Excessive noise
- Reduced opportunities to appreciate the beauty, serenity, and sounds of nature within MWNM

One campground, the Frank Valley Group Horse Camp, is within Mount Tamalpais Park approximately 400 feet west of Muir Woods Road. The camp is outside the study area, which extends 250 feet from the roadway centerline on each side. The camp is accessed from the west side of Muir Woods Road via a dirt road in the south-central portion of the study area, which is within the study area. The camp accommodates up to 25 people, with amenities including picnic tables, fire rings, drinking water, pit toilets, two horse troughs, and animal corrals.

The following three trails are in the study area:

- Redwood Creek Trail: This hiking and horseback riding trail is in Mount Tamalpais State Park. It is approximately 2.1 miles long and has a natural dirt surface. It generally follows a section of Redwood Creek on the east side of Muir Woods Road in the central portion of the study area. The trail is accessed from two trailheads on the east side of Muir Woods Road, with the northern trailhead located just south of MWNM and the southern trailhead located at CA-1 near the southern terminus of the Proposed Project. Redwood Creek Trail remains on the east side of Muir Woods Road for its full length, despite Redwood Creek transitioning to the west side of the

road just south of Santos Meadow. Approximately five small trail spurs provide informal access to the trail from the east side of Muir Woods Road, some of which are unsigned or gated. Pets and bicycles are not allowed on the trail.

- Heather Cutoff Trail: This 2.7-mile-long trail is in Mount Tamalpais State Park and GGNRA. It is used primarily for hiking and horseback riding. This trail does not directly intersect Muir Woods Road. It begins approximately 150 feet west of the road in the south-central portion of the study area and is accessed from a dirt road that provides access to Muir Beach LAN, LLC., an internet service provider.
- Dipsea Trail: This natural surface hiking trail is approximately 10 miles long and traverses MWNM and Mount Tamalpais State Park. It crosses Muir Woods Road at the northern end of the study area, running adjacent to the NPS maintenance parking lot on the north side of Muir Woods Road, and across the Muir Woods visitor center overflow parking lot on the south side. The trail includes wood beams and dirt stairs on both sides of Muir Woods Road where it crosses the road.
- One undesignated informal narrow dirt trail runs along the east side of Muir Woods Road in the northern part of the study area. This informal trail is approximately 800 feet long, beginning at the northern Redwood Creek Trail trailhead and ending just south of the existing Redwood Creek bridge. This unnamed trail is separated from Muir Woods Road by white bollards.

16.3 Regulatory Setting

This section provides an overview of federal, state, and local recreation regulations.

16.3.1 Federal

There are two federal regulations that are applicable to the Proposed Project related to recreation, which are discussed in the following subsections.

16.3.1.1 GGNRA and MWNM General Management Plan Environmental Impact Statement and Record of Decision

The GGNRA and Muir Woods National Monument General Management Plan Environmental Impact Statement and Record of Decision (NPS 2015a) is a 20-year plan that guides planning and decision-making at the GGNRA and MWNM. It serves as a foundation and framework for the management of the park lands, and it provides recommendations regarding the use of many park facilities.

16.3.1.2 Redwood Creek Watershed Vision for the Future

The *Redwood Creek Watershed Vision for the Future* (NPS 2003) identified goals and created a long-term vision for the watershed. It called for maintaining the watershed's

infrastructure—including recreational trails, roads, parking lots, and buildings—and ensuring visitor safety while minimizing impacts to natural and cultural resources.

16.3.2 State

There are no state regulations that are applicable to the Proposed Project related to recreation.

16.3.3 Local

There is one local regulation that is applicable to the Proposed Project related to recreation, which is discussed in the following subsection.

16.3.3.1 *Mount Tamalpais State Park General Management Plan*

The *Mount Tamalpais State Park General Management Plan* (CDPR 1981) provides general guidelines for the park's recreational management and development to focus on preservation, interpretation, and public use of its natural and scenic values.

16.4 Impact Analysis

The assessment of recreation impacts is provided in the responses to the following questions.

a) Would the Proposed Project 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?

The Proposed Project would not increase the use of existing neighborhood parks because none are within the study area. The Proposed Project would improve the safety and reliability of travel along Muir Woods Road for vehicles, park visitors, pedestrians, bicyclists, trail users, and emergency services. Trail connectivity also would be improved. The Proposed Project would not increase the capacity of Muir Woods Road. While such improvements could potentially attract more visitors, the NPS reservation system at MWNM manages peak visitation, visitor crowding, and traffic congestion on Muir Woods Road (NPS 2015b) by restricting the number of vehicles that can enter the park. While travel on Muir Woods Road would be improved, the Proposed Project is not expected to accelerate or increase the use of recreational facilities accessed from Muir Woods Road. Construction and operation of the Proposed Project would have a less than significant impact.

b) Does the Proposed Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The Proposed Project would formalize an approximate 800-foot-long undesignated informal trail along the east side of Muir Woods Road in the northern part of the study

area. The formalized trail would improve pedestrian safety compared to the existing informal trail. It would also provide a connection to the Deer Creek Fire Road south of Redwood Creek, and NPS's planned Redwood Creek Trail (to be constructed as part of a separate NPS project) north of Redwood Creek. Improvements to the informal trail would occur within the existing 50-foot roadway ROW and would have no physical effects on adjacent environmental resources. The Proposed Project would result in safer and more reliable access to and use of existing recreational facilities during operation, and it would accommodate planned improvements to the area's trail network. Construction and operation of the Proposed Project would have a less than significant impact.

16.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measure—in addition to AMM PUB-1 in Section 15.5 (Public Services – Avoidance and/or Minimization Measures), which maintains one open traffic lane during construction—would be implemented to avoid and/or minimize impacts on recreation:

- **AMM REC-1:** Access to all recreational resources, including MWNM, Mount Tamalpais State Park, GGNRA, Dipsea Trail, Redwood Creek Trail, Heather Cutoff Trail, Frank Valley Horse Camp access road, and other trail/camp access roads would be maintained throughout construction.

16.6 Mitigation Measures

No mitigation is required for recreation.

17 TRANSPORTATION

Would the Proposed Project:

Question	CEQA Determination
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	Less than Significant Impact
b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?	Less than Significant Impact
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	Less than Significant Impact
d) Result in inadequate emergency access?	Less than Significant Impact

17.1 Methodology

Transportation impacts were assessed by evaluating potential conflicts with transportation plans or 2025 State CEQA Guidelines Section 15064.3(b), increased hazards due to design features, and impacts to emergency access. The study area used to evaluate impacts to transportation is the construction footprint, where the Proposed Project may impact traffic, transit, bicyclists, and pedestrians.

17.2 Environmental Setting

Muir Woods Road connects to MWNM to the north and CA-1 to the south. Personal vehicles, shuttles, buses, and bicyclists bring almost 800,000 visitors annually to MWNM primarily using Muir Woods Road as access (NPS 2022a). This facility was originally designed as a two-lane road. Over time, the roadway has narrowed because of slope failures, and it no longer functions as a two-lane road in two locations: approximately 0.10 mile south of the Redwood Creek trailhead and approximately 0.03 mile north of the Frank Valley Horse Camp access road. The deteriorated roadway has led to congestion and long vehicle queues, impeding shuttle and tour buses, and reducing the effectiveness of public transit and other transportation services to MWNM. The narrow lane widths pose challenges for vehicles to safely pass bicyclists, and the lack of consistent shoulders do not permit bicyclists to ride outside of the vehicle lanes. To manage traffic conditions near MWNM, NPS has implemented a reservation system that limits the number of visitors entering MWNM.

17.3 Regulatory Setting

This section provides an overview of federal, state, and local transportation regulations.

17.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to transportation.

17.3.2 State

There are two state regulations that are applicable to the Proposed Project related to transportation, which are discussed in the following subsections.

17.3.2.1 SB 743 Vehicle Miles Traveled

SB 743 was signed into law in California in 2013, requiring the California Office of Planning and Research to identify new metrics for identifying and mitigating transportation impacts. Prior to SB 743, Level of Service was used as the performance metric for identifying impacts. SB 743 replaced this metric with a VMT approach in order to better align transportation impact analyses and mitigation outcomes with state goals related to GHG emission reductions, encouragement of infill development, and improvement of public health through development of multimodal transportation networks. In December 2018, the California Office of Planning and Research released the *Technical Advisory on Evaluating Transportation Impacts in CEQA* to provide guidance for assessing VMT, thresholds of significance, and mitigation measures (OPR 2018).

17.3.2.2 CEQA Section 15064.3(b)

2025 State CEQA Guidelines Section 15064.3(b) provides guidance on determining the significance of transportation impacts based on VMT. Caltrans has developed guidelines for VMT analysis, including the *Vehicle Miles Traveled–Focused Transportation Impact Study Guide* (Caltrans 2020b), *Transportation Analysis Under CEQA* (Caltrans 2020c), and Transportation Analysis Framework Under CEQA (Caltrans 2020d). Section 5.3.3 of the Transportation Analysis Framework Under CEQA states, “Generally, a qualitative analysis of VMT impacts associated from the construction of the Proposed Project would be appropriate… Vehicle trips used for construction purposes would be temporary, and any generated VMT would generally be minor and limited to construction equipment and personnel and would not result in long-term trip generation.”

17.3.3 Local

There are three local regulations that are applicable to the Proposed Project related to transportation, which are discussed in the following subsections.

17.3.3.1 Transportation Authority of Marin *Strategic Vision Plan*

The Transportation Authority of Marin *Strategic Vision Plan* (2017) is the long-range plan that provides a vision for all modes of transportation in Marin County and an update to the earlier 2003 Vision Plan, Moving Forward: A 25-Year Transportation Vision for Marin County. The *Strategic Vision Plan* sets out several key objectives, including the following:

- Contribute to economic vitality
- Create a flexible system that responds to changing technology
- Develop an efficient and effective transportation system
- Support a healthy environment and a healthy population
- Achieve safer travel

17.3.3.2 Plan Bay Area 2050

The *Plan Bay Area 2050* (ABAG and MTC 2021) is a 30-year plan that identifies a long-range vision for transportation within the region. The following are objectives for *Plan Bay Area 2050*:

- Maintain and optimize the existing transportation system
- Create healthy and safe streets for all users, including drivers, cyclists, and pedestrians
- Build a next-generation transit network

17.3.3.3 GGNRA Long Range Transportation Plan 2015-2035

The GGNRA Long Range Transportation Plan 2015-2035 (NPS 2015c) addresses the circulation system. This plan's objectives include preserving and protecting park resources by minimizing transportation impacts, as well as ensuring safety is a high priority for the park.

17.4 Impact Analysis

The assessment of transportation impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

During construction, the proposed activities could cause delays and congestion on Muir Woods Road for all roadway users. Construction could increase roadway congestion; AMM PUB-1 would limit delays to 30 minutes. Construction of the Proposed Project would have a less than significant impact on the circulation system.

In the longer-term, the Proposed Project would alleviate the known issues associated with safety and would provide a consistent 22-foot width for the road that meets current design standards. These improvements would enhance bicycle and pedestrian access and would support several of the objectives of the Transportation Authority of Marin *Strategic Vision Plan* (2017), *Plan Bay Area 2050* (ABAG and MTC 2021), GGNRA Long Range Transportation Plan 2015-2035 (NPS 2015c), and the *Marin Countywide Plan* (2007). A safer and more enjoyable travel experience on Muir Woods Road may attract more people to visit MWNM during operation. The reservation system implemented by the NPS would continue to limit the daily number of visitors. The Proposed Project is not expected to substantially increase the number of vehicles on Muir Woods Road. Operation of the Proposed Project would have a less than significant impact on the circulation system.

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

The 2025 State CEQA Guidelines Section 15064.3(b) provides guidance on determining the significance of transportation impacts based on VMT, pursuant to SB 743 as discussed in Section 17.3 (Transportation – Regulatory Setting), and directs that transportation projects that "reduce, or have no impact on, VMT should be presumed to cause a less than significant transportation impact." The Proposed Project would rehabilitate the existing roadway and would not add capacity beyond the original design capacity of the roadway. Due to the nature of the Proposed Project, a quantitative VMT assessment is not required, and a qualitative assessment for construction of the Proposed Project is provided.

Construction of the Proposed Project would result in a temporary, localized increase in VMT due to the trips made by workers and transportation of material and equipment. SB 743 establishes thresholds for transportation infrastructure projects that focus on operational travel rather than short-term construction activity. Construction of the Proposed Project would not add capacity to the existing roadway. Operation of the Proposed Project would not result in a permanent increase in VMT.

Under SB 743, the Technical Advisory offers a threshold for transportation infrastructure projects; however, this centers on induced operational travel, not construction movements.

The existing NPS reservation system would remain in place during operation of the Proposed Project, continuing to limit the number of daily visitors accessing MWNM on Muir Woods Road. Operation of the Proposed Project is not anticipated to result in changes to the surrounding circulation system. The Proposed Project would not increase capacity and would not lead to a measurable and substantial increase in vehicle travel.

Construction and operation of the Proposed Project would not conflict or be inconsistent with Section 15064.3(b) of the 2025 State CEQA Guidelines. Construction and operation of the Proposed Project would have a less than significant impact related to VMT.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The Proposed Project would improve Muir Woods Road to meet current design and safety standards. This includes removing the aging and deficient bridge over Redwood Creek and realigning the bridge and corresponding road approaches to improve safety and line of sight for vehicles, bicyclists, and pedestrians. No incompatible uses would be introduced to the corridor. Overall, the Proposed Project would enhance safety for all users and reduce hazards along the corridor. Construction and operation of the Proposed Project would have a less than significant impact.

d) Result in inadequate emergency access?

During construction, the Proposed Project may temporarily impact emergency access to areas north and south of the corridor. Fire and police response times may increase due to traffic delays. Emergency access would be maintained (refer to AMM PUB-1). This would ensure that the Proposed Project would not conflict with emergency operations. Generally, at least one lane of traffic would remain open with a maximum delay of 30 minutes, with priority given to vehicles conducting emergency operations. Construction of the Proposed Project would have a less than significant impact.

The Proposed Project would facilitate easier access to the roadway network during operation through widening, rehabilitation, repair, and resurfacing of the existing traffic lanes, thereby assisting emergency access. Improving the horizontal curve at the Redwood Creek bridge would increase the line of sight for drivers, and a wider roadway with a consistent width would facilitate better access/egress for large emergency response vehicles. This could also assist in providing better emergency response times. The Proposed Project would not result in inadequate emergency access. Operation of the Proposed Project would have a less than significant impact.

17.5 Avoidance and/or Minimization Measures

Refer to AMM PUB-1 in Section 15.5 (Public Services – Avoidance and/or Minimization Measures), which would require maintaining at least one open lane of traffic during construction to minimize impacts on transportation.

17.6 Mitigation Measures

No mitigation is required for transportation.

18 TRIBAL CULTURAL RESOURCES

Question	CEQA Determination
a) Would the Proposed Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in *Public Resources Code* Section 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:	N/A
i) 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	Less than Significant Impact
ii) 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. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	Less than Significant Impact

18.1 Methodology

As part of early background research and identification efforts, a search of the Sacred Lands File from the NAHC was requested and a list of tribes with information on the Proposed Project APE and vicinity was obtained. The NAHC recommended that the Proposed Project proponent contact the Federated Indians of Graton Rancheria and the Ione Band of Miwok Indians for more information about the cultural and tribal resources in the Proposed Project area. No other tribes were included on the list provided by the NAHC for Marin County. A thorough review was conducted of the CRHR and the NWIC.

Marin County is the lead agency for CEQA and AB 52. Marin County sent letters to the Federated Indians of Graton Rancheria and the Ione Band of Miwok Indians in March 2021 to notify them of the Proposed Project. The letters provided a description and map of the Proposed Project. In their letters, Marin County provided the tribes with an extended response timeframe of 60 days “due to the situation with Covid-19,” the viral pandemic occurring at the time. The Ione Band of Miwok Indians did not respond. The Federated Indians of Graton Rancheria responded in April 2021 with a formal request for tribal consultation and outlined topics to be included in the consultation, such as results of record searches and surveys, Proposed Project alternatives, mitigation measures, significance of tribal resources, and the significance of the Proposed Project’s impacts to tribal cultural resources. In response to Federated Indians of Graton Rancheria requests, Marin County and FHWA-CFLHD coordinated with the tribe to

arrange for a tribal monitor to be present during the archaeological testing that was conducted for the Proposed Project, and they provided the findings and results of file searches and field surveys to the tribe for review and input.

A draft of the Cultural Resources Assessment was provided to the Federated Indians of Graton Rancheria for review and comment, and a consultation meeting was held on March 15, 2023 to discuss the tribe's comments. The final report (Jacobs 2024d) addresses comments provided by the Federated Indians of Graton Rancheria.

18.2 Environmental Setting

PRC Section 21074 states that tribal cultural resources may be sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe.

The NAHC Sacred Lands File records search yielded negative results. The CRHR and the NWIC records indicated that the Proposed Project area contains no known tribal cultural resources that are listed or eligible for listing under these registers. The archaeological survey and testing conducted, during which a Federated Indians of Graton Rancheria Tribal monitor was present, revealed no new resources. There is a lack of cultural and tribal resources in the Proposed Project area, and no tribal cultural resources as defined in PRC Section 21074 are expected to occur within the Proposed Project area.

18.3 Regulatory Setting

This section provides an overview of federal, state, and local tribal cultural resource regulations.

18.3.1 Federal

There are three federal regulations that are applicable to the Proposed Project related to tribal cultural resources. Government-to-government consultation is discussed in Section A.4 (Tribal Consultation) in Chapter III, Circulation and Review. Section 106 consultation is discussed in Chapter 5, Cultural Resources.

18.3.1.1 National Historic Preservation Act

The NHPA, as amended (54 U.S.C. 300101 - 307108), and its implementing regulations, Protection of Historic Properties (36 CFR 800), requires federal agencies to consider the effects of their actions on historic properties for any federal undertaking. Historic properties are defined as those that are listed on the NRHP or meet certain criteria that render them eligible for listing in the NRHP. An effect on a historic property is "an alteration to the characteristics of a historic property qualifying it for inclusion or eligibility for the NRHP" (36 CFR 800.16).

18.3.1.2 EO 13175 Consultation and Coordination with Indian Tribal Governments

EO 13175 was issued on November 6, 2000, by President Bill Clinton. Its purpose is to establish regular and meaningful consultation and collaboration between federal agencies and tribal governments when developing policies that have tribal implications. EO 13175 is also referred to as Government-to-Government consultation.

18.3.1.3 DOT EO 5301.1A DOT Tribal Consultation Policy and Procedures

DOT EO 5301.1A establishes DOT-wide policy, authority delegation, and responsibilities to ensure compliance with EO 13175 and other directives, mandating consultation with Indian Tribes to create tribal-responsive programs, policies, and procedures.

18.3.2 State

There are seven state regulations that are applicable to the Proposed Project related to tribal cultural resources, which are discussed in the following subsections.

18.3.2.1 PRC Section 21074

PRC Section 21074 defines "tribal cultural resources" under CEQA as sites, features, places, cultural landscapes, sacred places, or objects with cultural value to a California Native American tribe, that are either listed in—or eligible for listing in—the CRHR, or are included in a local historical resources register (per PRC Section 5020.1(k)).

18.3.2.2 PRC Sections 21080.3.1 and 21084.2

PRC Section 21080.3.1 ("California Native American tribes' expertise concerning tribal cultural resources") requires that "Prior to the release of a Negative Declaration, MND, or EIR for a project, the lead agency will begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the Proposed Project" if the tribe requested to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe, and if the tribe responds in writing within 30 days of receipt of the formal notification and requests the consultation. PRC Section 21080.3.1 also states that "the Native American Heritage Commission (NAHC) will assist the lead agency in identifying the California Native American tribes that are traditionally and culturally affiliated with the project area."

PRC Section 21084.2 also was modified to state that "a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (State of California 2017).

18.3.2.3 AB 52 Native Americans: CEQA

California AB 52 requires public agencies to consult with tribes during the CEQA process. AB 52 required an update to the 2025 State CEQA Guidelines to include questions related to tribal cultural resources, which are discussed in Section 18.4 (Tribal Cultural Resources – Impact Analysis).

18.3.2.4 PRC Sections 5097.9 and 5097.97

PRC Section 5097.9 (Protection of Native American Religious Sites and Cemeteries) applies to public agencies and private parties using or occupying public property under a public license, permit, grant, lease, or contract issued on or after July 1, 1977. It prohibits interference with freely expressing or exercising Native American religion, as protected by the U.S. and California Constitutions, and it prohibits severe or irreparable damage to Native American sanctified cemeteries, places of worship, religious or ceremonial sites, or sacred shrines on public and is enforceable by the NAHC (PRC Section 5097.97).

18.3.2.5 PRC Section 97-5097.991

PRC Section 97-5097.991 declares the policy of the State of California that Native American human remains and associated grave artifacts are to be repatriated—returned to the appropriate tribes or lineal descendants.

18.3.2.6 PRC Sections 5097.993-5097.994

PRC Section 5097.993-5097.994 covers Native American historic, cultural, or sacred sites listed, or eligible for listing, in the California Register of Historic Resources under Section 5024.1. This includes ruins, burial grounds, archaeological sites, inscriptions, rock art, and other cultural features.

18.3.2.7 *California Health and Safety Code* Sections 7050.5 and 7052

California Health and Safety Code Section 7050.5 (Unlawful Disturbance of Human Remains) and 7052 (Felony Offense Involving Human Remains) prohibits knowingly mutilating, disinterring, willfully removing, or wantonly disturbing human remains found outside dedicated cemeteries, unless authorized by law. A person who willfully mutilates remains known to be human, without legal authority, commits a felony.

18.3.3 Local

There are no local regulations that are applicable to the Proposed Project related to tribal cultural resources.

18.4 Impact Analysis

The assessment of tribal cultural resource impacts is provided in the responses to the following questions.

a) Would the Proposed Project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 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:

i) 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

The review of the CRHR and the NWIC indicated that the Proposed Project area contains no known tribal cultural resources that are listed or eligible for listing under these registers. The NAHC Sacred Lands File records search yielded negative results. Tribal cultural resources as defined in PRC Section 21074 are unlikely to be present within the Proposed Project area. The Proposed Project would not have a significant impact to a historical resource, as defined in PRC Section 5020.1(k). The Proposed Project would not cause adverse changes to tribal cultural resources listed or eligible for listing under the CRHR or in a local register of historical resources. Construction and operation of the Proposed Project would have a less than significant impact.

ii) 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. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

The NAHC Sacred Lands Files search yielded negative results. There are no records on the CRHR, or in a local register of historical resources. The intensive field survey also discovered no new resources. Results of the file and records search and field surveys indicate that there is a lack of tribal cultural resources in the Proposed Project area. As a result, tribal cultural resources as defined in PRC Section 21074 are unlikely to be present in the Proposed Project area. If evidence of tribal cultural resources is discovered during construction, AMM CULT-2 through AMM CULT-4 would be implemented to avoid and/or minimize impacts.

Construction and operation of the Proposed Project would have a less than significant impact to a tribal cultural resource, as defined in PRC Section 5024.1(c).

18.5 Avoidance and/or Minimization Measures

AMM CULT-2 through AMM CULT-4 in Section 5.5 (Cultural Resources – Avoidance and/or Minimization Measures) address stop work and notification protocols in the case of inadvertent discoveries of archaeological resources or human remains. These avoidance and/or minimization measures would avoid and/or minimize impacts to tribal cultural resources.

18.6 Mitigation Measures

No mitigation is required for tribal cultural resources.

19 UTILITIES AND SERVICE SYSTEMS

Would the Proposed Project:

Question	CEQA Determination
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	Less than Significant Impact
b) Have sufficient water supplies available to serve the Proposed Project and reasonably foreseeable future development during normal, dry, and multiple dry years?	Less than Significant Impact
c) Result in a determination by the wastewater treatment provider which serves or may serve the Proposed Project that it has adequate capacity to serve the Proposed Project's projected demand in addition to the provider's existing commitments?	No Impact
d) 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?	Less than Significant Impact
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less than Significant Impact

19.1 Methodology

A review of utility information within the construction limits of the Proposed Project (study area) was performed using data provided by NPS and Marin County, along with a field survey and desktop review of electric, water, and telephone lines (Jacobs 2021).

19.2 Environmental Setting

Known utilities within the study area include the following:

- Electric – PG&E overhead lines are at the beginning of the corridor to approximately the proposed Redwood Creek bridge replacement and then begin again at the southernmost bridge over Redwood Creek, and poles generally continue for the remainder of the corridor.
- Telephone – AT&T underground lines are at the beginning of the corridor to approximately the southernmost bridge over Redwood Creek where the lines transition to a utility pole and continue overhead for the remainder of the corridor.
- Water – NPS, CDPR, and Muir Beach Community Service District all have water utilities within the study area. Two water lines are within the study area: an NPS-owned water line that runs along the northbound lane of the road from the

beginning of the corridor to approximately the Conlon Lot and a CDPR-owned water line that crosses the road near the southernmost Redwood Creek bridge and extends to a well near the creek. Muir Beach Community Service District has well sites on the creek side of the road between Kent Canyon and the southern end of Santos Meadow. While these are outside the study area, a water valve is at an existing driveway just south of Santos Meadow and an underground waterline is anticipated to run along Muir Woods Road toward CA-1.

- Sewer – Sausalito-Marin County Sanitary District has a planned gravity pipeline in the northbound lane from the beginning of the corridor extending approximately 400 feet south to the Annex Lot associated with MWNM. A sewer force main pipeline also crosses the road near MWNM's Conlon Lot.

Water service is provided to the nearby MWNM by the Marin Municipal Water District (MMWD) and Muir Beach Community Service District, which provides connection with the Muir Beach housing community. Seventy-five percent of the MMWD's water comes from seven reservoirs and is treated at the MMWD's water treatment plants. The other 25 percent of the MMWD's water is imported from the Sonoma County Water Agency, which comes from the Russian River, and the water is filtered naturally through 80 feet of sand beds. This water is then blended with the MMWD's reservoir water in the distribution system (MMWD 2023). Wastewater service is provided to MWNM by the Tamalpais Community Services District's Sanitation Department to the Sausalito-Marin City Sanitary District wastewater lines (TCSD 2023).

19.3 Regulatory Setting

This section provides an overview of federal, state, and local utility and service system regulations.

19.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to utilities.

19.3.2 State

There are four state regulations that are applicable to the Proposed Project related to transportation, which are discussed in the following subsections.

19.3.2.1 *California Public Utilities Code* Division 5, Chapter 3.1, Articles 1 and 2

Division 5, Public Work and Public Purchases, Chapter 3.1, Protection of Underground Infrastructure, Articles 1 and 2 of the *California Public Utilities Code* requires public agencies to document existing main or trunkline utility facilities within a construction

area. Public agencies are also required to contact regional notification centers prior to excavation of any subsurface installations.

19.3.2.2 AB 939 California Integrated Waste Management Act

AB 939 requires each jurisdiction in California to divert at least 50 percent of its waste stream away from landfills either through waste reduction, recycling, or other means.

19.3.2.3 AB 341 Mandatory Commercial Recycling

AB 341 sets forth the requirements of the statewide mandatory commercial recycling program. A business (includes public entities) that generates 4 cubic yards or more of commercial solid waste per week must arrange for recycling services.

19.3.2.4 SB 1383 Short-Lived Climate Pollutant Reduction Strategy

SB 1383 aims to divert organics from landfills and recover surplus edible food for human consumption. The goal of SB 1383 is to reduce short-lived climate pollutant GHGs that contribute to climate change. SB 1383 targets methane emitted from the waste sector.

19.3.3 Local

There are no local regulations that are applicable to the Proposed Project related to utilities.

19.4 Impact Analysis

The assessment of utility and service impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Partial relocations of overhead power lines and underground telephone lines would be required, and adjustments of water valve access covers and sanitary sewer maintenance holes are anticipated. The Proposed Project would expand stormwater treatment facilities in the form of measures such as biostrips or bioswales where feasible, and would repair and replace current stormwater management, such as culverts, to meet current design standards. Relocated utilities and expanded stormwater treatment facilities would be accommodated within the construction limits of the Proposed Project within the Marin County ROW. No relocations are anticipated for the sewer line, water lines, or well sites. Marin County and FHWA-CFLHD would continue

to coordinate with AT&T and PG&E—the impacted utility service providers—prior to and during construction (Jacobs 2021).

BMPs for utility location and coordination would be followed, as described in AMM UTL-1. Construction and operation of the Proposed Project would have a less than significant impact.

b) Have sufficient water supplies available to serve the Proposed Project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Activities associated with the Proposed Project during construction would not generate a substantial increase in demand for water supply, as it is likely that water demand to dampen dust and to provide potable drinking water to workers while on site would be brought in from an external source. The increase of water use would be minimal. Construction of the Proposed Project would have a less than significant impact to the overall water supply services.

Operation of the Proposed Project would not introduce any new land uses and an increase in demand for water services would not occur. As a result, the Proposed Project would not change the demand for water supplies. Operation of the Proposed Project would have a less than significant impact.

c) Result in a determination by the wastewater treatment provider which serves or may serve the Proposed Project that it has adequate capacity to serve the Proposed Project's projected demand in addition to the provider's existing commitments?

The activities likely to generate wastewater during construction would occur from workers using portable toilets/portable cabins. Wastewater from portable toilets/cabins would be removed by a licensed wastewater disposal contractor and would not be treated by Tamalpais Community Services District's Sanitation Department. There are no activities associated with the Proposed Project during operation that would have an increase in wastewater generation or a change in demand for wastewater services. There would be no change in service capacity and no impact to the Tamalpais Community Services District's Sanitation Department's existing commitments. Construction and operation of the Proposed Project would have no impact.

d) 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?

The Proposed Project would generate solid waste during construction through reconstruction and demolition activities, as well as trash generated by personnel. It is anticipated that the pavement would be pulverized and remain on site and used as an aggregate base course for the new roadway construction. Material generated from excavation would generally be reused in construction to limit the amount of waste that

needs to be hauled off site. If any solid waste generated during construction cannot be used as part of the Proposed Project, a permitted landfill would be identified with sufficient permitted capacity to accommodate the solid waste disposal needs. Disposal of solid waste would comply with federal, state, and local statutes and regulations. The contractor would be required to comply with federal, state, and local statutes and regulations related to solid waste. Construction and operation of the Proposed Project would have a less than significant impact.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

During construction and operation, the Proposed Project would comply with all federal, state, and local regulations and statutes related to solid waste. The Proposed Project would support policies for recycling nonhazardous waste to avoid and/or minimize processing efforts in landfills and would be consistent with ABs 939 and 341 and SB 1383. Construction and operation of the Proposed Project would have a less than significant impact.

19.5 Avoidance and/or Minimization Measures

The following avoidance and/or minimization measure will be implemented to avoid and/or minimize impacts to utilities and service systems:

- **AMM UTL-1:** Before beginning work, the contractor would contact USA North 811 to mark utilities, which would be avoided where feasible. Where utilities are to be relocated or adjusted, Marin County or their contractors would notify utility owners and would sequence relocations or adjustments to accommodate construction and avoid and/or minimize potential service disruptions.

19.6 Mitigation Measures

No mitigation is required for utilities and service systems.

20 WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the Proposed Project:

Question	CEQA Determination
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	No Impact
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	Less than Significant Impact
c) 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?	Less than Significant Impact
d) 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?	Less than Significant Impact

20.1 Methodology

The study area is the construction limits for the Proposed Project. The fire hazard severity zones (FHSZs) categorized and mapped by the CAL FIRE were reviewed to determine whether the study area was within or near state responsibility areas, where the state or local government is responsible for wildfire prevention and suppression (State of California 2012) or lands classified as very high FHSZs. Proposed Project elements found to be within or near state responsibility areas or lands classified by very high FHSZs were reviewed for potential fire hazard impacts increasing the risk of wildfires.

20.2 Environmental Setting

Most of the study area is within a state responsibility area and is considered by CAL FIRE as a very high FHSZ (CAL FIRE 2023).

20.3 Regulatory Setting

This section provides an overview of federal, state, and local wildfire regulations.

20.3.1 Federal

There are no federal regulations that are applicable to the Proposed Project related to wildfire.

20.3.2 State

There are two state regulations that are applicable to the Proposed Project related to wildfire, which are discussed in the following subsections.

20.3.2.1 PRC Section 21100

PRC Section 21000 et seq. requires the consideration of Proposed Project impacts to wildfire-prone areas.

20.3.2.2 CAL FIRE 2018 Strategic Fire Plan for California

The CAL FIRE's *2018 Strategic Fire Plan for California* (2018) focuses on two main concepts: (1) fire prevention and suppression activities to protect lives, property, and ecosystems and (2) natural resource management to maintain the state's forests. The overarching goal of the 2018 plan is to create a more fire-resilient natural environment, fire-resistant buildings and infrastructure, and a society that is aware and responsive to the benefits and threats of wildland fires.

20.3.3 Local

There are two local regulations that are applicable to the Proposed Project related to wildfire, which are discussed in the following subsection.

20.3.3.1 Marin County Unit Strategic Fire Plan

The Marin County Unit Strategic Fire Plan (MCFD 2022) documents the goals of the MCFD to prevent loss of life and property from wildfires by implementing measures such as defensible space regulations, fuel treatments, species thinning, awareness campaigns, building codes enforcement, and collaboration with various agencies and communities to reduce fire hazards.

20.3.3.2 *Marin Countywide Plan* 2007-2020

The *Marin Countywide Plan* (Marin County 2007) contains the following policy that applies to the Proposed Project area:

- **EH-4.5 Regulate Land Uses to Protect from Wildland Fires.** Use land use regulations, including but not limited to subdivision approvals and denials, as means of protecting people and property from hazards associated with wildland fires.

20.4 Impact Analysis

The assessment of wildfire impacts is provided in the responses to the following questions.

Would the Proposed Project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

As discussed in Section 9.3.3 (Greenhouse Gas Emissions – Impact Analysis), the Proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The Proposed Project would be consistent with the goals of the *Marin Countywide Plan* (Marin County 2007), the *Marin County Local Hazard Mitigation Plan* (Marin County Sherriff's Office 2012), and the *Marin Operational Area Emergency Operations Plan* (Marin County Sherriff's Office 2014) by facilitating easier access through the corridor and thereby aiding emergency responders during an incident. Construction and operation of the Proposed Project would have no impact.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Wildfire behavior is influenced by weather conditions, particularly wind, which provides extra oxygen and allows the fire to spread more rapidly. On average, the wind speeds in the study area range from 4.0 to 5.5 meters per second, which are relatively low (U.S. Department of Energy 2012). In addition to wind speed, the topography of a landscape, like steep slopes, can aid in the progression of fire as heat naturally rises and accelerates uphill. The landscape within the study area generally consists of vegetated slopes. The Proposed Project would stabilize and revegetate slopes, thereby minimizing erosion that is gradually steepening slope grades along the corridor. The proposed improvements would not increase the risk of exposure to airborne pollutants or the uncontrolled spread of wildfires beyond the existing conditions for park employees, visitors, and road users.

During construction, materials that could lead to high pollutant concentrations in the event of a wildfire would not be regularly used. The Proposed Project does not involve large quantities of combustible material that would increase the risk of wildfires. There are fire protection services, including Muir Beach Volunteer Fire Department and MCFD, near the corridor. The risk of an uncontrolled wildfire is low. Any potential wildfires could be responded to by these fire stations.

The Proposed Project would improve the safety and reliability of emergency access during operation through widening, repairing, rehabilitating, and resurfacing the existing road. Replacement of the bridge over Redwood Creek would further improve emergency access. Drivers would have increased lines of sight due to the realigned and more expansive deck to navigate around stopped vehicles, pedestrians, and bikers. Together, these improvements would facilitate better and safer access for large emergency response vehicles and likely result in faster emergency response times.

The Proposed Project would not exacerbate wildfire risks or expose occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire, but in the long-term it would improve emergency response times in the event of a future wildfire. Construction and operation of the Proposed Project would have a less than significant impact.

c) 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?

The proposed improvements primarily consist of resurfacing, restoring, and rehabilitating the existing roadway and substandard bridge over Redwood Creek. No relocations are anticipated for the sewer line, water lines, or well sites. It is anticipated that the Proposed Project would require partial relocation of the overhead power lines and undergrounding telephone lines in isolated areas. Appropriate safety precautions would be followed when relocating utilities, and BMPs would be implemented (refer to AMM UTL-1). The Proposed Project does not include installing utilities and therefore would not require maintenance beyond existing conditions that would exacerbate fire risk or would result in temporary or ongoing impacts to the environment beyond existing conditions. Construction and operation of the Proposed Project would have a less than significant impact.

d) 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?

The Proposed Project is not within an area underlain by large-scale landslide or debris flows (Yeh and Associates 2019). The grading of cut slopes required for proposed roadway widening would not occur in areas of a known landslide or geologic conditions that would require mitigation. The potential for landslide or slope instability within the Proposed Project area is considered low.

The Proposed Project would improve drainage by replacing deteriorating and substandard culverts that convey flood flows into the drainage facilities. Existing drainage patterns would be preserved. Increased impervious surfaces may increase surface runoff. Concentrated flows of runoff would not be designed or permitted to run over slopes. Drainage culverts with riprap aprons would also reduce the potential for increases in surface runoff. Where slope failures have occurred, the slopes would be stabilized using methods such as biotechnical rockery, RSS, and rock buttresses.

The Proposed Project would not increase exposure of people or structures to flooding or landslides as a result of runoff, post-fire slope instability, or drainage changes, but rather would reduce exposure. Construction and operation of the Proposed Project would have a less than significant impact.

20.5 Avoidance and/or Minimization Measures

Refer to AMM PUB-1 in Section 15.5 (Public Services – Avoidance and/or Minimization Measures), which would ensure emergency vehicles are given priority passage through the construction limits during construction.

20.6 Mitigation Measures

No mitigation is required for wildfires.

21 MANDATORY FINDINGS OF SIGNIFICANCE

Question	CEQA Determination
a) Does the Proposed Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	Less than Significant Impact with Mitigation Incorporated
b) Does the Proposed Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	Less than Significant Impact with Mitigation Incorporated
c) Does the Proposed Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	No Impact

21.1 Impact Analysis

a) Does the Proposed Project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

The Proposed Project has the potential to impact candidate, sensitive, or special-status species and their habitats. Construction and operation of the Proposed Project would have a less than significant impact on special-status plants, invertebrates, birds, and mammals, and would have a less than significant impact with mitigation incorporated on fish, amphibians, and reptiles. Construction and operation of the Proposed Project would have a less than significant impact with mitigation incorporated to NMFS-designated critical habitat for coho salmon and steelhead.

The Proposed Project would temporarily impact approximately 0.1 acre and permanently impact approximately 0.1 acre of wetlands. Of the delineated natural watercourses, approximately 0.3 acre (1,863 linear feet) would be temporarily impacted and approximately 0.2 acre (917 linear feet) would be permanently impacted. Permanent impacts on wetlands and other aquatic resources will be addressed through applicable federal and state authorizations, as required, and implementation of

avoidance, minimization, and compensatory mitigation measures, as applicable. The Proposed Project would temporarily impact approximately 1.7 acres and permanently impact approximately 2.1 acres of riparian vegetation. Construction and operation of the Proposed Project would result in a less than significant impact to state or federally protected wetlands.

It was determined that construction and operation of the Proposed Project would have less than significant impacts to the historic properties within the APE. This determination reflects the conclusion that the Proposed Project would not directly or indirectly alter any of the characteristics of those historic resources that qualify them for listing on the NRHP/CRHR. Tribal cultural resources as defined in PRC Section 21074 are unlikely to be present in the Proposed Project area. The Proposed Project is not expected to eliminate important examples of the major periods of California history or prehistory.

b) Does the Proposed Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

General past and present actions within or adjacent to the Proposed Project area include the following:

- Road construction and maintenance, including Muir Woods Road and its associated features (ditches, culverts, and bridges), and roads that intersect Muir Woods Road
- Development construction, such as residences and outbuildings, commercial buildings, orchards, and trails
- Park visitor facilities construction and maintenance, such as the MWNM visitor center, parking areas, and trails
- Power pole and powerline installation
- Park and roadway signage installation

Other past, present, and reasonably foreseeable future actions in or adjacent to the Proposed Project area primarily consist of federal- or state-funded projects in MWNM and Mount Tamalpais State Park, specifically a group of previously completed and planned projects known as the Redwood Renewal Projects. The purpose of these projects is to incorporate critical infrastructure, enhance visitor experience, improve safety and water quality, restore and protect natural and cultural resources within MWNM, and improve water quality, safety, and recreation within Mount Tamalpais State Park. These projects are as follows:

- NPS Muir Woods Lift Station and Water/Wastewater Rehabilitation Project: This project was completed in 2021 and included installing a new lift station, relocating the

wastewater line out of ecologically sensitive areas of the Redwood Creek corridor, and bringing the water and wastewater infrastructure up to current code requirements.

- NPS Muir Woods Sustainable Access Project: Planned to be constructed from 2028 to 2031, this project includes reconfiguring the entrance plaza, parking areas, and Redwood Creek Trail; moving infrastructure out of the Redwood Creek hazard zone; replacing the Dipsea Trail bridge; and managing stormwater and repairing erosion to improve water quality and protect salmon habitat.
- NPS Muir Woods Salmon Habitat Enhancement and Bridge Replacement Project: Phase I of the salmon habitat enhancement project was completed in 2019 and 2020. Phase II began construction in 2023. This project includes restoring habitat to enhance aquatic habitat for coho salmon and replacing four pedestrian bridges with longer spans to improve hydraulic capacity and facilitate further habitat enhancement. The bridges are planned to be replaced in 2027.
- CDPR Redwood Creek Trail Realignment and Rehabilitation Project: This project is currently being implemented. Redwood Creek improvements would create a safer, more sustainable trail with reduced maintenance needs, as well as benefit water quality in Redwood Creek and protect habitat for listed aquatic species. The improvements also include moving the trail out of the floodplain to allow future projects to reconnect Redwood Creek to its floodplain. These improvements would further improve hydrologic and geomorphic functions in the watershed.
- CDPR Redwood Creek Restoration Project: This project is planned to be implemented within the next 2 to 4 years and would include restoring habitat along Redwood Creek in Mount Tamalpais State Park.

The Marin County land development website (Marin County Public Works 2022) notes that there are several planned development projects near Muir Beach. These projects are outside the Proposed Project area in a developed residential neighborhood and are not expected to contribute to cumulative impacts.

Cumulative impacts were evaluated for resources that were determined to experience Less Than Significant Impacts with Mitigation Incorporated as a result of the Proposed Project. Those resources include agriculture/forestry and biological resources.

- Agriculture/Forestry: The Proposed Project would require permanent easements and ROW acquisitions that would impact approximately 1.8 acres of the 5.8 acres of land classified as farmland of statewide importance within the study area. These impacts would be adjacent to the existing roadway and in the area of bridge replacement and road realignment. No agricultural uses occur in these areas. Construction and operation of the Proposed Project would have less than significant impact to farmland. Construction and operation of the Proposed Project would have no impact to Williamson Act contract land, land zoned for agricultural use, or areas zoned as forest land or timberland because these land designations are not present within the

Proposed Project area. Trees in the area of the Redwood Creek bridge replacement and road realignment would be directly impacted by clearing and grubbing. Based on the preliminary design, it is estimated that a total of approximately 1.7 acres of woodlands (0.2 acre of Douglas-fir/coast redwood forest and 1.5 acres of hardwood forest) would be temporarily impacted, and a total of approximately 2.2 acres of woodlands (0.3 acre of Douglas-fir/coast redwood and 1.9 acres of hardwood forest) would be permanently impacted. By implementing AMM BIO-1 and MM BIO-4, these cumulative impacts would be avoided, minimized, and/or mitigated to a less than significant level during construction. Operation of the Proposed Project would have no cumulative impacts.

- Biological Resources: It was determined that the impacts would have a less than significant impact with mitigation incorporated, as well as avoidance and/or minimization measures included in the Proposed Project. The Redwood Renewal Projects generally would have beneficial impacts to wildlife through habitat restoration and would improve water quality through restoration activities and treatment of stormwater. When combined with the impacts of these projects, the primary impact of the Proposed Project would occur during potential overlap of timing, which may impact wildlife by disrupting normal breeding, feeding, or sheltering behavior from noise and visual presence related to activities during construction. By implementing AMM BIO-1 through AMM BIO-48, as well as MM BIO-2 and MM BIO-3, for the Proposed Project, as well as those being implemented by the NPS for the Redwood Creek Renewal Projects, cumulative impacts to wildlife are anticipated to be less than significant during construction and operation. Maintenance activities on Muir Woods Road, when combined with the Proposed Project, also would result in impacts to roadside vegetation and habitat during construction and operation. Cumulative impacts to vegetation during construction are anticipated to be less than significant by implementing AMM BIO-1 through AMM BIO-19, including revegetation after construction. Operation of the Proposed Project would have no cumulative impacts to vegetation.
- Conclusion: Combined with the impacts of past, present, and reasonably foreseeable future actions within and adjacent to the Proposed Project area, construction and operation of the Proposed Project would result in less than significant cumulative impacts by implementing AMM BIO-1 through AMM BIO-48 and MM BIO-1 through MM BIO-3.

c) Does the Proposed Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

The slope stabilization measures, drainage improvements, bridge replacement, and roadway improvements proposed would result in beneficial impacts to park visitors, residents, and employees by creating a safer and more reliable transportation route. The Proposed Project would not cause substantial adverse effects on human beings, either directly or indirectly.

V. Proposed Determination: (Completed by Marin County Environmental Coordinator)

Pursuant to Sections 15081 and 15070 of the 2025 State CEQA Guidelines, the forgoing Draft Initial Study evaluation, and the entire administrative record for the Proposed Project:

Determination	Yes or No
I find that the Proposed Project WILL NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	No
I find that although the Proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.	Yes
I find that the Proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	No

Name: Rachel Reid

Title: Environmental Coordinator

Signature: 

Date: April 22, 2026

VI. Documents Incorporated By Reference

The following is a list of relevant information sources that have been incorporated by reference into the forgoing Draft IS with Proposed MND pursuant to Section 15150 of the 2025 State CEQA Guidelines. These documents are both a matter of public record and available for public inspection either online or at the Planning Division office of the Marin County Community Development Agency, Suite 308, 3501 Civic Center Drive, San Rafael. The information incorporated from these documents will be considered to be set forth fully in this Draft IS with Proposed MND.

Advisory Committee on Water Information (ACWI). 2023. National Ground-Water Monitoring Network map viewer. May 24. https://cida.usgs.gov/ngwmn/index.jsp.

Association of Bay Area Governments (ABAG) and Metropolitan Transportation Commission (MTC). 2021. *Plan Bay Area 2050*. October 21. https://planbayarea.org/sites/default/files/documents/Plan_Bay_Area_2050_October_2021.pdf.

Atkins North America, Inc. (Atkins). 2019a. *Hazardous Materials Technical Memorandum, Muir Woods Road Project*. Unpublished. July.

Atkins North America, Inc. (Atkins). 2019b. *Biological Evaluation Report for Muir Woods Road Project*. Draft. August.

Avocet Research Associates. 2023. *Northern Spotted Owl Surveys: Redwood Creek Trail Realignment Project 2023*. Memorandum to California State Parks. May 16.

Bay Area Air Quality Management District (Air District). 2017a. *Bay Area 2017 Clean Air Plan: Spare the Air, Cool the Climate*. https://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans.

Bay Area Air Quality Management District (Air District). 2017b. *California Environmental Quality Act Air Quality Guidelines*. https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en.

Bay Area Air Quality Management District (Air District). 2022. California Environmental Quality Act Air Quality Guidelines. https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines.

Bay Area Air Quality Management District (Air District). 2023. Air Quality Standards and Attainment Status. https://www.baaqmd.gov/about-air-quality/research-and-data/air-quality-standards-and-attainment-status.

Bay Area Stormwater Managers Agencies Association (BASMAA). 2000. *Start at the Source Tools Handbook*. June.

Bureau of Land Management (BLM). 2016. *Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands*. IM 2016-124 Instruction

Memorandum and Attachment 1. https://www.blm.gov/policy/im-2016-124 and https://www.blm.gov/sites/blm.gov/files/uploads/IM2016-124_att1.pdf.

California Air Resources Board (CARB). 2017. *California's 2017 Climate Change Scoping Plan*. https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2017-scoping-plan-documents.

California Air Resources Board (CARB). 2022. *2022 Scoping Plan for Achieving Carbon Neutrality*. https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents.

California Coastal Commission (CCC). 1981. Categorical Exclusion Maps for Marin County. Volume 3 - Categorical Exclusions.pdf. Accessed March 7, 2025. https://www.marincounty.gov/sites/g/files/fdkgoe241/files/2024-02/maps-of-the-coastal-exclusion-boundaries-and-other-related-documents.pdf

California Department of Conservation (CDC). n.d. EQ Zapp: California Earthquake Hazards Zone Application. Accessed June 20, 2019. https://www.conservation.ca.gov/cgs/geohazards/eq-zapp.

California Department of Conservation (CDC). 2022a. California Important Farmland Finder. https://maps.conservation.ca.gov/dlrp/ciff/.

California Department of Conservation (CDC). 2022b. California Williamson Act Enrollment 2022 map. https://gis.conservation.ca.gov/portal/home/webmap/viewer.html?layers=998307767e644dc49d80edd352d1e969.

California Department of Conservation (CDC). 2023a. Williamson Act Program. https://www.conservation.ca.gov/dlrp/wa.

California Department of Conservation (CDC). 2023b. EQ Zapp: California Earthquake Hazards Zone Application. Accessed August 15, 2023. https://www.conservation.ca.gov/cgs/geohazards/eq-zapp.

California Department of Fish and Wildlife (CDFW). 1988a. *California Wildlife Habitat Relationships System, Valley Foothill Riparian*. California Interagency Wildlife Task Group. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67352&inline.

California Department of Fish and Wildlife (CDFW).1988b. *California Wildlife Habitat Relationships System, Douglas Fir*. California Interagency Wildlife Task Group. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67318&inline.

California Department of Fish and Wildlife (CDFW). 1988c. *California Wildlife Habitat Relationships System, Coastal Scrub*. California Interagency Wildlife Task Group. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67374&inline.

California Department of Fish and Wildlife (CDFW). 1988d. *California Wildlife Habitat Relationships System, Barren*. California Interagency Wildlife Task Group. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67422&inline.

California Department of Fish and Wildlife (CDFW). 2005a. *California Wildlife Habitat Relationships System, Coastal Oak Woodland*. California Wildlife Task Group. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67344&inline.

California Department of Fish and Wildlife (CDFW). 2005b. *California Wildlife Habitat Relationships System, Annual Grassland*. California Wildlife Task Group. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=67384&inline.

California Department of Fish and Wildlife (CDFW). 2022a. CNDDB Species Occurrence GIS Database. https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data.

California Department of Fish and Wildlife (CDFW). 2022b. Northern Spotted Owl. BIOS 6 Database. https://wildlife.ca.gov/Data/BIOS.

California Department of Fish and Wildlife (CDFW). 2023a. 9-Quad Species List. BIOS 5 Database. https://wildlife.ca.gov/Data/BIOS.

California Department of Fish and Wildlife (CDFW). 2023b. *Special Animals List*. California Natural Diversity Database. July. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109406&inline.

California Department of Fish and Wildlife (CDFW). 2023c. *State and Federally Listed Endangered and Threatened Animals of California*. California Natural Diversity Database. July. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109405&inline.

California Department of Fish and Wildlife (CDFW). 2023d. *State and Federally Listed Endangered, Threatened, and Rare Plants of California*. California Natural Diversity Database. July. https://www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109390&inline.

California Department of Fish and Wildlife (CDFW). 2025. New Zealand Mudsnails. California's Invaders: New Zealand Mudsnail. March 7. https://wildlife.ca.gov/Conservation/Invasives/Species/NZmudsnail.

California Department of Forestry and Fire Protection (CAL FIRE). 2018. *2018 Strategic Fire Plan for California*. August 22. https://osfm.fire.ca.gov/media/5590/2018-strategic-fire-plan-approved-08_22_18.pdf.

California Department of Forestry and Fire Protection (CAL FIRE). 2023. Fire Hazard Severity Zones in State Responsibility Area Map Viewer. June. https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=988d431a42b242b29d89597ab693d008.

California Department of Food and Agriculture (CDFA). 2021. California Noxious Weeds. https://www.cdfa.ca.gov/plant/ipc/encycloweedia/weedinfo/winfo_table-sciname.html.

California Department of Parks and Recreation (CDPR). 1981. *Mount Tamalpais State Park General Management Plan*. https://www.parks.ca.gov/?page_id=24361.

California Department of Parks and Recreation (CDPR). 2016. *Mount Tamalpais State Park*. http://www.parks.ca.gov/pages/471/files/MountTamalpaisSPFinalWebLayout110816.pdf.

California Department of Parks and Recreation (CDPR) n.d. Mount Tamalpais State Park. Accessed August 15, 2023. https://www.parks.ca.gov/?page_id=471#:~:text=Just%20north%20of%20San%20Francisco's,open%20grasslands%2C%20and%20sturdy%20chaparral.

California Department of Toxic Substance Control (DTSC). 2023. EnviroStor. Accessed July 19. https://www.envirostor.dtsc.ca.gov/public/.

California Department of Transportation (Caltrans). 2020a. *Transportation and Construction Vibration Guidance Manual*. April. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf.

California Department of Transportation (Caltrans). 2020b. *Vehicle Miles Traveled-Focused: Transportation Impact Study Guide*. May. Available online at: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-05-20-approved-vmt-focused-tisg-a11y.pdf.

California Department of Transportation (Caltrans). 2020c. *Transportation Analysis under CEQA: First Edition. Evaluating Transportation Impacts of State Highway System Projects.* September. Available online at: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-09-10-1st-edition-tac-fnl-a11y.pdf.

California Department of Transportation (Caltrans). 2020d. *Transportation Analysis Framework: First Edition. Evaluating Transportation Impacts of State Highway System Projects*. September. Available online at: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/sb-743/2020-09-10-1st-edition-taf-fnl-a11y.pdf.

California Department of Transportation (Caltrans). n.d. California Scenic Highway Mapping System. Los Angeles County. Accessed April 12, 2023. https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=465dfd3d807c46cc8e8057116f1aacaa.

California Governor's Office of Emergency Services (Cal OES). 2017. *State of California Emergency Plan*. October. https://www.caloes.ca.gov/wp-content/uploads/Preparedness/Documents/California_State_Emergency_Plan_2017.pdf.

California Native Plant Society (CNPS). 2023. Rare Plant Inventory. Version 9.5. January. http://www.rareplants.cnps.org/.

California Office of Planning and Research (OPR). 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. April. Available online at: https://opr.ca.gov/docs/20180416-743_Technical_Advisory_4.16.18.pdf.

California State Historic Preservation Officer (SHPO). 2024. *Determinations/Findings of Eligibility and Effect for the Proposed Muir Woods Road Improvement Project, Marin County, CA*. August 29.

California State Water Resource Control Board (SWRCB). 2021. *State Policy for Water Quality Control: State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State*. https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf.

California State Water Resources Control Board (SWRCB). 2022a. State and Regional Water Boards. February 22. https://www.waterboards.ca.gov/waterboards_map.html.

California State Water Resources Control Board (SWRCB). 2022b. *2020-2022 California Integrated Report*. May. https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2020_2022_integrated_report.html.

California State Water Resources Control Board (SWRCB). 2023. *Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*. March 7. https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basinplan/web/bp_ch1-7_print.html.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. NTIS No. AD A176 912. https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/Website%20Organization/Corps%20of%20Engineers%20Wetlands%20Delineation%20Manual%20(1987).pdf.

Federal Emergency Management Agency (FEMA). 2017. Flood Insurance Rate Map (FIRM) Map 06041C0465E and 06041C0505E. August 15. https://msc.fema.gov/portal/search?AddressQuery=muir%20woods%20national%20monument#searchresultsanchor.

Federal Emergency Management Agency (FEMA). n.d. Glossary. Accessed May 30, 2023. https://www.fema.gov/about/glossary.

Federal Highway Administration (FHWA). 2005. Roadway Construction Noise Model Database. Judith L. Rochat, Ph.D. and Clay N. Reherman. Volpe Center Acoustics

Facility Environmental Measurement and Modeling. TRB ADC40 Summer Meeting. Seattle, WA.

Fong, Darren, Biologist, National Park Service, Point Reyes National Seashore. 2023. Personal communication (Teams calls) with Jacobs project team members. October 5 and 30.

GeoSearch. 2019. GeoSearch Radius MapReport. March 27.

Golden Gate National Recreation Area (GGNRA). 2019. Nature. https://www.nps.gov/goga/learn/nature/index.htm.

Jacobs. 2021a. *ROW Summary Report, Muir Woods Road*. CA FLAP MRN CR 107(1). February.

Jacobs. 2021. *Utilities Summary Report, Muir Woods Road*. CA FLAP MRN CR107(1).

Jacobs. 2022a. *Aquatic Resources Delineation Report, Muir Woods Road Project*. CA FLAP MRN CR107(1).

Jacobs. 2022b. *Nesting Bird Survey Report for the Muir Woods Road Project*. CA FLAP MRN CR107(1).

Jacobs. 2023. *USFWS Biological Assessment Report, Muir Woods Road Project*. CA FLAP MRN CR107(1).

Jacobs. 2024a. *Biological Resources Report, Muir Woods Road Project*. CA FLAP MRN CR107(1).

Jacobs. 2024b. *USFWS Biological Assessment Report Amendment, Muir Woods Road Project*. CA FLAP MRN CR107(1).

Jacobs. 2024c. *NMFS Biological Assessment Report, Muir Woods Road Project*. CA FLAP MRN CR107(1).

Jacobs. 2024d. *Cultural Resources Assessment, Muir Woods Road Project*. CA FLAP MRN CR107(1).

Marin County. 1979. *Marin County Local Coastal Program Unit 1*. Amended 2021. https://www.marincounty.org/depts/cd/divisions/planning/local-coastal-program.

Marin County. 2005a. *Geology, Mineral Resources and Hazardous Materials Technical Background Report*. Marin County Community Development Agency, Planning Division. November. https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/background-reports/geology_background_report.pdf.

Marin County. 2005b. *Noise Technical Background Report*. https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/county-wide-plan/background-reports/noisebr.pdf.

Marin County. 2007. *Marin Countywide Plan*. November 6. https://calaverascap.com/wp-content/uploads/2011/06/Marin-CWP_CD2.pdf.

Marin County. 2019a. *Marin County Local Coastal Program Land Use Plan*. Certified February 6. https://www.marincounty.gov/sites/g/files/fdkgoe241/files/2024-02/lcp-edits_land-use-plan_102023.pdf.

Marin County. 2019b. MarinMap Map Viewer. Accessed June 18, 2019. https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer.

Marin County. 2020. *Marin County Unincorporated Area Climate Action Plan 2030*. https://www.marincounty.gov/sites/g/files/fdkgoe241/files/2024-01/cap-2030_12082020final.pdf.

Marin County. 2023a. Marin County GIS Open Data. January. https://gisopendata.marincounty.org/search?tags=environment.

Marin County. 2023b. MarinMap Map Viewer. Accessed May 4, 2023. https://www.marinmap.org/Html5Viewer/Index.html?viewer=smmdataviewer.

Marin County. 2023c. Marin County Zoning Data. https://gisopendata.marincounty.gov/datasets/eec281c30e664c75bd568eb61f901544_0/explore?location=37.859049%2C-122.571752%2C16.32.

Marin County. 2023d. *Tree Removal Permit Fact Sheet*. https://www.marincounty.org/-/media/files/departments/cd/planning/currentplanning/publications/factsheets/treeremoval_fs.pdf.

Marin County. 2023e. *Marin County Housing Element*. https://www.marincounty.gov/sites/g/files/fdkgoe241/files/2024-01/marincountyhousingelementcombined20232031.pdf.

Marin County Fire Department (MCFD). 2022. *Marin County Unit Strategic Fire Plan & Community Wildfire Protection Plan (CWPP)*. May 6. https://osfm.fire.ca.gov/media/gkvdobdi/2022-marin-county-unit-fire-plan.pdf.

Marin County Fire Department (MCFD). 2023. Throckmorton Ridge Fire Station. Accessed April 5, 2023. https://www.marincounty.org/depts/fr/divisions/operations/stations/throckmorton.

Marin County Public Works. 2022. Marin County Public Works land development. https://publicworks.marincounty.org/projects/.

Marin County Sherriff's Office. 2012. *Marin County Local Hazard Mitigation Plan*. https://www.marinsheriff.org/assets/downloads/LHMP_2012update_withResolution.pdf.

Marin County Sherriff's Office. 2014. *Marin Operational Area Emergency Operations Plan*. https://www.marinsheriff.org/assets/downloads/EOP-Final-Draft-10.14.2014.pdf.

Marin Municipal Water District (MMWD). 2023. About Our Supply. Accessed August 20, 2023. https://www.marinwater.org/WaterSupplyPlanning.

Muck, J. 2010. "Biological effects of sediment on bull trout and their habitat—guidance for evaluating effects." *Fish and Wildlife Service*, Lacey, p 57.

National Archives and Records Administration (NARA). 2016. *Endangered and Threatened Wildlife and Plants; Determination of Critical Habitat for the Marbled Murrelet*. *Federal Register*. Vol. 81 No. 150. https://www.govinfo.gov/content/pkg/FR-2016-08-04/pdf/2016-18376.pdf#page=1.

National Marine Fisheries Service (NMFS). 2001. *Water Drafting Specifications. National Marine Fisheries Service, Southwest Region*. https://media.fisheries.noaa.gov/dam-migration/water_drafting_specification_guidelines.pdf.

National Marine Fisheries Service (NMFS). 2005. "Endangered and Threatened Species; Designation of Critical Habitat for Seven Evolutionarily Significant Units of Pacific Salmon and Steelhead in California; Final Rule." *Federal Register* 70(170), p. 52488.

National Marine Fisheries Service (NMFS). 2022. Species Directory. https://www.fisheries.noaa.gov/species-directory.

National Park Service (NPS) and California Department of Fish and Wildlife (CDFW). 2003. Vegetation Point Reyes [ds 169]. https://map.dfg.ca.gov/metadata/DS0169.html.

National Park Service (NPS). 2003. *Redwood Creek Watershed Vision for the Future*. July. https://www.nps.gov/goga/learn/management/upload/RWC%20Vision%20Statement.pdf.

National Park Service (NPS). 2006. *Management Policies 2006*. https://www.nps.gov/subjects/policy/upload/MP_2006.pdf.

National Park Service (NPS). 2014. *Golden Gate National Recreation Area, Muir Woods National Monument General Management Plan/Environmental Impact Statement*. April. https://parkplanning.nps.gov/document.cfm?parkID=303&projectID=15075&documentID=58777.

National Park Service (NPS). 2015a. *Golden Gate National Recreation Area, Muir Woods National Monument General Management Plan/Record of Decision*. https://www.nps.gov/goga/learn/management/index.htm.

National Park Service (NPS). 2015b. *Muir Woods Reservation System Environmental Assessment*. October. https://parkplanning.nps.gov/document.cfm?parkID=303&projectID=48272&documentID=68898.

National Park Service (NPS). 2015c. *Golden Gate National Recreation Area Long Range Transportation Plan 2015-2035*. https://issuu.com/fehrandpeers/docs/ggnpreport.

National Park Service (NPS). 2016a. Geologic Map of GGNRA, Fort Point NHS, and Muir Woods NM – Sheet 1. Geologic Resources Division. https://irma.nps.gov/DataStore/DownloadFile/598230.

National Park Service (NPS). 2016b. Geologic Map of GGNRA, Fort Point NHS, and Muir Woods NM – Sheet 2. Geologic Resources Division. https://irma.nps.gov/DataStore/DownloadFile/598231.

National Park Service (NPS). 2016c. Golden Gate National Recreation Area, including Fort Point National Historic Site and Muir Woods National Monument - Geologic Resources Inventory Report. Geologic Resources Division. https://irma.nps.gov/DataStore/DownloadFile/553281.

National Park Service (NPS). 2018a. 1998-2000 Bat Surveys within Muir Woods National Monument. https://www.nps.gov/articles/bat-inventory-muir-woods.htm.

National Park Service (NPS). 2018b. Redwood Creek Trail Realignment Project. https://parkplanning.nps.gov/projectHome.cfm?projectId=54012.

National Park Service (NPS). 2019. Muir Woods & Vicinity Trail Map. September. https://www.nps.gov/goga/planyourvisit/upload/map-muwo-trail-2019-small.pdf.

National Park Service (NPS). 2021a. *Muir Woods Marbled Murrelet Monitoring Summary 2018-2021*. Redwood Renewal Projects. Golden Gate National Recreation Area, Fort Mason, San Francisco, California.

National Park Service (NPS). 2021b. *Muir Woods Northern Spotted Owl and Barred Owl Monitoring Summary 2018-2021*. Redwood Renewal Projects.

National Park Service (NPS). 2022a. National Park Service Visitor Use Statistics. https://irma.nps.gov/STATS/Reports/Park/MUWO.

National Park Service (NPS). 2022b. *Second Re-initiation of Formal Consultation on the Muir Woods Water and Sewer Line Rehabilitation Project, Salmon Habitat Enhancement and Bridge Replacement Project, and the Sustainable Access Project at Muir Woods National Monument (MWNM) in Marin County, California*. File number 1.A.2 (GOGA-NR).

National Park Service (NPS). 2023a. California Red Legged Frog Occurrence Data for Breeding Site Ponds (GIS Shapefiles). Provided by Darren Fong of NPS via email on May 1, 2023.

National Park Service (NPS). 2023b. *Northern Spotted Owl Activity Center with 0.25-mile Buffers*. PDF Map.

National Park Service (NPS). 2023c. American Badger Survey Maps.

National Park Service (NPS). 2023d. Hike. Muir Woods National Monument. January. https://www.nps.gov/muwo/planyourvisit/hike.htm.

Natural Resources Conservation Service (NRCS). 2023a. Farmland Conversion Impact Rating For Corridor Type Projects. October 2023.

Natural Resources Conservation Service (NRCS). 2023b. Web Soil Survey. https://websoilsurvey.nrcs.usda.gov/app/.

Pacific Fishery Management Council. 2014. Appendix A to the *Pacific Coast Salmon Fishery Management Plan*. Portland, Oregon: Pacific Fishery Management Council. https://www.pcouncil.org/documents/2019/08/salmon-efh-appendix-a.pdf/.

Samara Group and Oregon Native Turtle Working Group (Jefferson Chapter) for Oregon Department of Fish and Wildlife. 2020. *Visual Encounter Survey for Western Pond Turtle*. https://www.dfw.state.or.us/conservationstrategy/docs/Appendix_N_VES_Protocol_April_2020.pdf.

Society of Vertebrate Paleontology (SVP). 2010. *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*. https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf.

State of California. 2012. California Fire Prevention Fee – Frequently Asked Questions. Accessed August 22, 2023. https://www.firepreventionfee.org/sra_faqs/.

State of California. 2017. *Technical Advisory, AB [Assembly Bill] 52 and Tribal Cultural Resources in CEQA*. Governor's Office of Planning and Research. June.

Transportation Authority of Marin (TAM). 2017. *Strategic Vision Plan*. https://www.tam.ca.gov/wp-content/uploads/2019/07/TAM_Strategic_Vision_Plan_FinalReport_112017.pdf.

Tamalpais Community Services District's Sanitation Department (TCSD). 2023. Sewer and Sanitation. Accessed August 20, 2023. https://www.tamcsd.org/departments/waste-water/.

U.S. Army Corps of Engineers (USACE). 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. Version 2.0. ERDC/EL TR-08-28. U.S. Army Engineer Research and Development Center, Vicksburg, MS.

U.S. Department of Energy. 2012. WINDExchange - California 30-Meter Residential-Scale Wind Resource Map. https://windexchange.energy.gov/maps-data/145.

U.S. Environmental Protection Agency (EPA). 2023. EPA's Environmental Justice Screening and Mapping Tool. Version 2.11. EJScreen ACS Summary Report generated from https://ejscreen.epa.gov/mapper/.

U.S. Environmental Protection Agency (EPA). n.d. My Environment. Accessed July 20. https://enviro.epa.gov/myenvironment/.

U.S. Fish and Wildlife Service (USFWS). 2020. *Revision to 2006 Estimating the effects of auditory and visual disturbance to northern spotted owls and marbled murrelets in northwestern California*. Memorandum, Arcata Fish and Wildlife Office, Arcata, California. https://citizensofebeysreserve.com/wp-content/uploads/2022/06/MaMu-Noise-Thresholds-USFWS.pdf.

U.S. Fish and Wildlife Service (USFWS). 2023a. Life history and habitat information on various federal listed species. Environmental Conservation Online System (ECOS). January. https://ecos.fws.gov/ecp/.

U.S. Fish and Wildlife Service (USFWS). 2023b. Species IPaC List. January. https://ipac.ecosphere.fws.gov/.

U.S. Fish and Wildlife Service (USFWS). 2023c. National Wetlands Inventory Mapper. January. https://www.fws.gov/program/ national-wetlands-inventory/wetlands-mapper.

U.S. Geological Survey (USGS). 2000. Geologic map and map database of parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California. https://ngmdb.usgs.gov/ngm-bin/pdp/zui_viewer.pl?id=10424.

U.S. Geological Survey (USGS). 2011. Mineral Resources Data System. https://mrdata.usgs.gov/mrds/map-graded.html.

U.S. Geological Survey (USGS). 2023a. Hydrologic Unit Code (HUC) for Tomales-Drakes Bay Watershed. January. https://water.usgs.gov/lookup/getwatershed?18050005.

U.S. Geological Survey (USGS). 2023b. National Hydrography Dataset. January. https://www.usgs.gov/national-hydrography/national-hydrography-dataset.

U.S. Geological Survey (USGS). n.d. Mineral Deposit Database. Accessed August 16, 2023. https://mrdata.usgs.gov/deposit/map-us.html.

Yeh and Associates, Inc. 2016. *Geotechnical Report*. Draft. CA FLAP MRN CR107(1), Muir Woods Road, Mount Tamalpais State Park, Marin County, California. October.

Yeh and Associates, Inc. 2019. *Geotechnical Memorandum - Geologic Hazards*. Muir Woods Road, CA FLAP MRN CR107(1), Marin County, California. May.

VII. Acronyms and Abbreviations

Acronym	Definition
AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
Air District	Bay Area Air District
APE	area of potential effect
AVE	area of visual effects
BA	biological assessment
BMP	best management practice
BRR	Biological Resources Report
CA-1	California Highway 1
CAA	Clean Air Act
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CalEEMod	California Emissions Estimator Model
CAL FIRE	California Department of Forestry and Fire Protection
CCA	California Coastal Act
CCC	Central California Coast
CCR	*California Code of Regulations*
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFLHD	Central Federal Lands Highway Division
CFR	*Code of Federal Regulations*
CGP	Construction General Permit
CNDDB	California Natural Diversity Database
CO	carbon monoxide

Acronym	Definition
CO_2	carbon dioxide
CRHR	California Register of Historical Resources
CRLF	California red-legged frog
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
CZMA	Coastal Zone Management Act
DBH	diameter at breast height
DOT	U.S. Department of Transportation
EFH	essential fish habitat
EIR	environmental impact report
EPA	U.S. Environmental Protection Agency
EO	Executive Order
ESA	Endangered Species Act
FESL	fabric-encapsulated soil lifts
FHSZ	fire hazard severity zones
FHWA	Federal Highway Administration
FLAP	Federal Lands Access Program
FPPA	Farmland Protection Policy Act
GGNRA	Golden Gate National Recreation Area
GHG	greenhouse gas
GIS	Geographic Information System
IS	Initial Study
LCP	Local Coastal Program
Ldn	average sound level
Marin County	Marin County Department of Public Works
Marin CAP	Marin County Unincorporated Climate Action Plan
MCFD	Marin County Fire Department
MMWD	Marin Municipal Water District

Acronym	Definition
MND	mitigated negative declaration
MRP	Mineral Resource Preservation
MWNM	Muir Woods National Monument
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NPT	northwestern pond turtle
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSO	northern spotted owl
NWIC	Northwest Information Center
OA	Open Area
OHWM	ordinary high-water mark
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PM	particulate matter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
PPV	peak particle velocity
PRC	*California Public Resources Code*
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
ROW	right-of-way
RSS	reinforced soil slopes

Acronym	Definition
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCA	Stream Conservation Area
SFBAAB	San Francisco Bay Area Air Basin
SHPO	State Historic Preservation Officer
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
U.S.C.	*United States Code*
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
WCA	Wetland Conservation Area
WEAT	Worker Environmental Awareness Training