Draft Initial Study/Proposed Mitigated Negative Declaration

Creek Road Bridge Rehabilitation Project

Town of Fairfax, Marin County, California





Prepared for:

Town of Fairfax
142 Bolinas Road
Fairfax, California 94930

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May 2026

WRA #22304

Contents

1.0 INTRODUCTION AND PURPOSE 5
2.0 PROJECT INFORMATION 5
2.1 Project Title 5
2.2 Lead Agency Name and Address 5
2.3 Contact Person and Phone Number 5
2.4 Project Location 5
2.5 General Plan Designation and Zoning District 6
2.5.1 General Plan Designation 6
2.5.2 Zoning District 6
3.0 PROJECT DESCRIPTION 11
3.1 Project Background and Purpose 11
3.2 Detailed Description of the Project 11
3.3 Project Construction 12
3.3.1 Construction Schedule 12
3.3.2 Site Access and Staging 12
3.3.3 Site Work 12
3.4 Project–Related Approvals, Agreements, and Permits 16
3.4.1 Army Corps of Engineers 16
3.4.2 California Department of Fish and Wildlife 16
3.4.3 Regional Water Quality Control Board 16
4.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED 17
4.1 Determination 17
4.2 Initial Study Checklist 18
4.2.1 Aesthetics 19
4.2.2 Agricultural and Forestry Resources 22
4.2.3 Air Quality 24
4.2.4 Biological Resources 28
4.2.5 Cultural Resources 45
4.2.6 Energy 49
4.2.7 Geology and Soils 50
4.2.8 Greenhouse Gas Emissions 55
4.2.9 Hazards and Hazardous Materials 58
4.2.10 Hydrology and Water Quality 62
4.2.11 Land Use and Planning 67

4.2.12 Mineral Resources 70
4.2.13 Noise 71
4.2.14 Population and Housing 81
4.2.15 Public Services 82
4.2.16 Recreation 85
4.2.17 Transportation 86
4.2.18 Tribal Cultural Resources 89
4.2.19 Utilities and Service Systems 92
4.2.20 Wildfire 96
4.2.21 Mandatory Findings of Significance 99
5.0 REFERENCES 103

List of Tables

Table 1. Proposed Project Direct Impacts to Natural Communities of Special Concern 40
Table 2. Proposed Project Direct Impacts to Jurisdictional Areas by Agency 40
Table 3. Typical Noise Levels in the Environment 73
Table 4. Reactions of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels 74
Table 5. Exterior Noise Limits 76
Table 6. Vibration Source Levels for Construction Equipment 79

List of Figures

Figure 1. Project Site Regional Location 7
Figure 2. Aerial Photograph of the Project Site 8
Figure 3. Views of the Project Site 9
Figure 4. Views of Surrounding Land Uses 10
Figure 5. Creek Road Bridge Seismic Retrofit Details 15

List of Appendices

Appendix A. Natural Environment Study
Appendix B. Biological Assessment
Appendix C. Noise Study
Appendix D. Cultural Resources Reports

List of Acronyms & Abbreviations

AAQS	ambient air quality standards
ABAG	Association of Bay Area Governments
APE	Area of Potential Effects
ASR	Archaeological Survey Report
BA	Biological Assessment
BAAD	Bay Area Air District
BMPs	Best Management Practices
BSA	Biological Study Area
Bridge	Creek Road Bridge
CAL FIRE	California Department of Fire and Forestry
Caltrans	California Department of Transportation
CAMUTCD	California Manual on Uniform Traffic Control Devices
CAP	Clean Air Plan
CCC	Central California Coast
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDOC	California Department of Conservation
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CMP	Congestion Management Program
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPS	California Native Plant Society
CO_2	carbon dioxide
Corps	United States Army Corps of Engineers
CRHR	California Register of Historic Resources
CWA	Clean Water Act
dB	decibel
dBA	A-weighted decibel scale
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
EFH	Essential Fish Habitat
EMS	Emergency Service Vehicles
EPA	Environmental Protection Agency
ESA	Endangered Species Act
Far Western	Far Western Anthropological Research Group Inc.
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FHSZ	Fire Hazard Severity Zone
FIRM	Federal Insurance Rate Maps
FPD	Fairfax Police Department
GHGs	Greenhouse Gases
HPSR	Historical Property Survey Report

HRER	Historical Resources Evaluation Report
I&R	Illingworth and Rodkin
IS/MND	Initial Study/Mitigated Negative Declaration
JRP	JRP Historical Consulting, LLC
Ldn	Day/Night Average Sound Level
MCSTOPPP	Marin County Stormwater Pollution Prevention Program
MLD	Most Likely Descendant
MMWD	Marin Municipal Water District
NAHC	Native American Heritage Commission
NBI	National Bridge Inventory
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
N_2O	nitrous oxide
NO_x	Oxides of nitrogen
NSR	New Source Review
NRHP	National Register of Historic Places
O3	Ozone
OHW	Ordinary High Water
PM	Particulate matter
PPV	Peak Particle Velocity
PRC	Public Resources Code
ROG	reactive organic gases
RVFD	Ross Valley Fire Department
RWQCB	Regional Water Quality Control Board
SFBAAB	San Francisco Bay Area Air Basin
SIP	State Implementation Plan
SWPPP	Storm Water Prevention Program
SWQCB	State Water Quality Control Board
TNS	Technical Noise Supplement
Town	Town of Fairfax
TPY	tons per year
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VMT	Vehicle Miles Traveled
WDR	Waste Discharge Requirement
WRA	WRA, Inc.
WUI	Wildland Urban Interface
XPI	Extended Phase I

1.0 INTRODUCTION AND PURPOSE

This Initial Study/Proposed Mitigated Negative Declaration (IS/MND) of environmental impacts is being prepared to conform to the requirements of the California Environmental Quality Act (CEQA) Statute and Guidelines (California Code of Regulations 15000 et. seq.). This IS/MND evaluates the potential environmental impacts which might reasonably be anticipated to result from implementation of the Creek Road Bridge Project (proposed project). The Town of Fairfax (Town) is the Lead Agency as defined under CEQA Guidelines Section 15050.

The purpose of an Initial Study is to provide the Lead Agency with information to use as the basis for deciding whether to prepare an Environmental Impact Report or a Negative Declaration for the proposed project. A Negative Declaration briefly describes the reason that a proposed project would result in a significant effect on the environment, and the basis of the decision not to prepare an EIR. This Initial Study describes the Town's efforts to ensure that all resource impacts are reduced to less-than-significant level with mitigation incorporated, qualifying for a Proposed Mitigated Negative Declaration.

This IS/MND provides the Town and the public with an understanding of the potential environmental impacts associated with the Proposed project. The purpose of the proposed project includes the physical modifications of the Creek Road Bridge in the Town of Fairfax that is proposed to undergo seismic retrofit.

2.0 PROJECT INFORMATION

2.1 Project Title

Creek Road Bridge Project

2.2 Lead Agency Name and Address

Town of Fairfax
142 Bolinas Road
Fairfax, California 94930

2.3 Contact Person and Phone Number

Kristin Arnold
Public Works Director
(415) 453-0291

karnold@townoffairfaxca.gov

2.4 Project Location

The project area is located in a developed area of the Town of Fairfax in Marin County (Figure 1). The project site is located on Creek Road between Wessen Road and Bolinas Road, and includes Town right-of-way and portions of Assessor Parcel Number (APN) 002-024-03, 002-024-04 and 002-024-23 (Figure 2). The project area encompasses the Creek Road Bridge (California Department of Transportation [Caltrans] Bridge No. 27C-0144) over San Anselmo Creek, which was constructed in 1929 (Figure 3). To perform the retrofit construction work, bridge areas and

components in the creek need to be accessed. Access to the creek would likely be from Wessen Lane, located adjacent to the bridge.

2.5 General Plan Designation and Zoning District

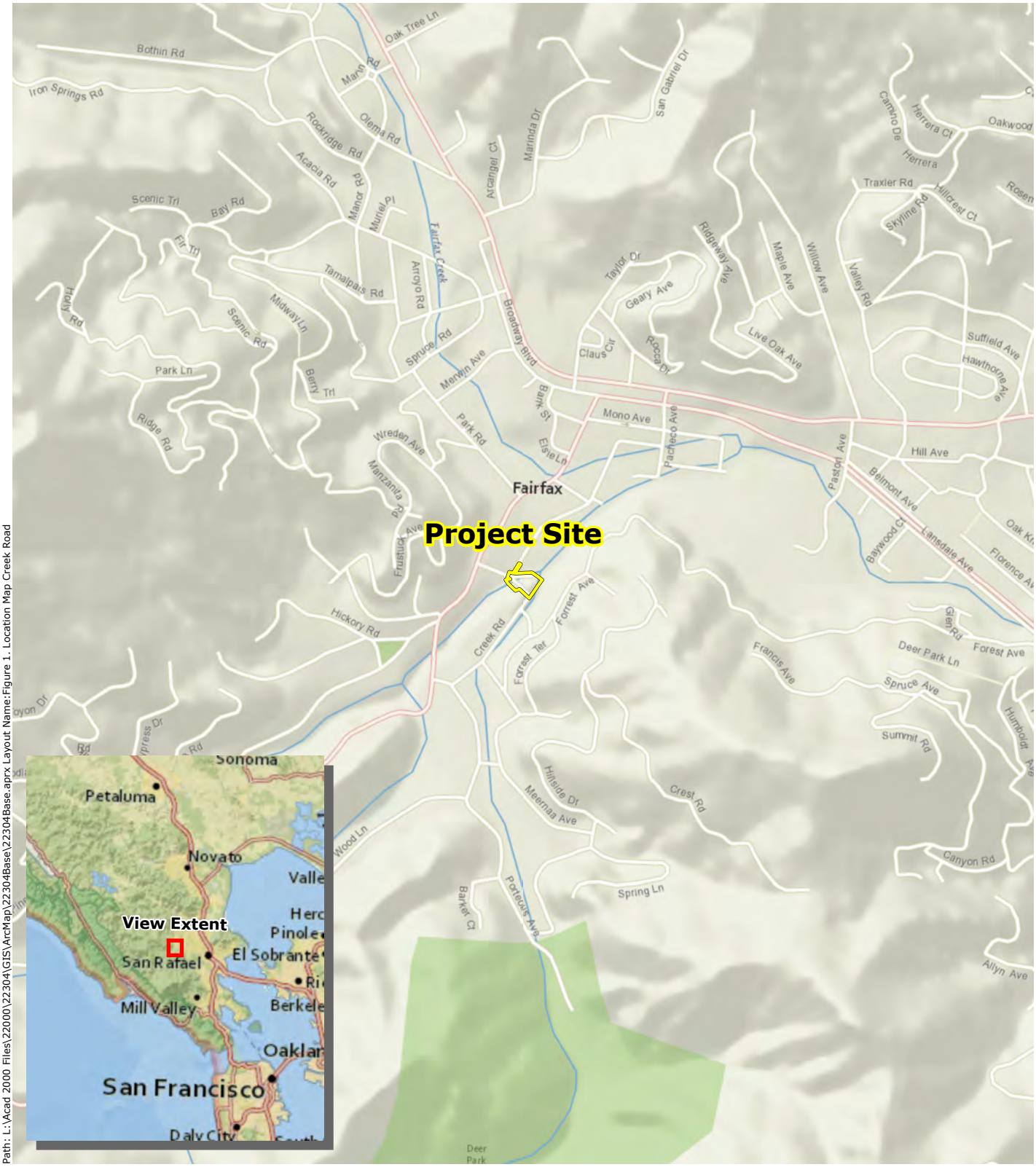
2.5.1 General Plan Designation

- Residential 1-6 du/acre

2.5.2 Zoning District

- RD -5.5-7 Residential

The project is located with a single-family residential neighborhood. The project is entirely surrounded by single family residential land uses (Figure 4). San Anselmo Creek and its channel is the only other land use present within the immediate vicinity of the project area.



Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\22304Base\22304Base.aprx Layout Name:Figure 1. Location Map Creek Road

Sources: National Geographic, WRA | Prepared By: rhona.mcchesney, 4/21/2026

Figure 1. Project Site Regional Location

Creek Road Bridge Rehabilitation Project
Town of Fairfax, California

0 500 1,000 Feet

N

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Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\22304Base\22304Base.aprx Layout Name: Figure 2. Aerial Photograph of the Project Site Creek Road

Sources: USDA NAIP Imagery 2024, WRA | Prepared By: rhona.mcchesney, 4/21/2026

Figure 2. Aerial Photograph of the Project Site

Creek Road Bridge Rehabilitation Project
Fairfax, California

0 50 100 Feet

N

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View 1. View of the project area looking northwest from Creek Road.



View 2. View of the project area looking northwest from Creek Road.



View 3. View of the project area looking southeast from Creek Road.



View 4. View of the project area looking northwest from San Anselmo Creek.

Figure 3. Views of the Project Site

Creek Road Bridge Rehabilitation Project
Town of Fairfax, California

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View 1. View looking southwest from Creek Road.



View 2. View looking northeast from Creek Road.



View 3. View looking northeast from Creek Road.



View 4. View looking east from Wessen Lane.

Figure 4. Views of the Surrounding Land Uses

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3.0 PROJECT DESCRIPTION

3.1 Project Background and Purpose

Much of the bridge infrastructure in the Town of Fairfax is of an older vintage, dating back 80 to 90 years. The Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek was constructed in 1929 and needs a seismic retrofit. The purpose of the project is to retrofit Creek Road Bridge in order to enhance seismic safety, to prevent catastrophic failure during a Maximum Credible Earthquake (defined as the largest possible earthquake that could occur in a specific region, based on geological and seismological evidence, such as the length of active faults), and, overall, maintain the structural integrity of the bridge in the interests of public safety.

3.2 Detailed Description of the Project

Creek Road Bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. The interior spans are supported on three sets of 2-column bents (structural components, often called a pier, that support the bridge deck at intermediate points along its length) in the creek and the exterior spans are connected to an abutment at each end of the bridge. There are no as-built plans available for the Creek Road Bridge, but an as-built bridge General Plan and additional structural detail sheets have been prepared for this project.

During the New Year's Eve flood of 2005, the bridge's west abutment experienced a major washout. The abutment was repaired and protected with rock riprap after a closure period. Travelers utilized other streets as a detour around the closure during the repair period. In September 2010, a Scour Plan of Action Report was prepared, which is an evaluation required by the Federal Highway Administration for managing bridges that are vulnerable to failure from flooding. No new significant bridge foundation scour was identified around the bridge foundations.

The bridge is composed of a series of simple spans, supported by concrete cap beams (horizontal beams that sit atop bridge piers or columns to support the bridge deck and transfer loads from the superstructure to the substructure) on 2-column bents. This configuration is one of the vulnerabilities of the bridge. Since the superstructure spans are not connected to the substructure, they have the potential of unseating and collapsing during the movements induced by large seismic events. In the initial design phase of the project, structural analyses confirmed the seismic vulnerability of the bridge. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the Maximum Credible Earthquake, potentially resulting in the loss of life.

Further, it was concluded during the development of the seismic retrofit strategy for the bridge that, even if the spans were attached to the substructure of the bridge to prevent them from unseating during a seismic event, the entire substructure would still collapse due to the longitudinal movement and the momentum of the superstructure. Therefore, the bridge substructure must be retrofitted as well.

Retrofit concepts and costs to address the bridge's seismic deficiencies were presented in a Seismic Retrofit Report prepared and submitted to Caltrans. For retrofit repairs, Caltrans

approved Alternate 2 of the Seismic Retrofit Strategy Report. The construction details for Alternative 2 can be found in Figure 5. The Caltrans philosophy of retrofit design for a non-lifeline facility, such as Creek Road Bridge, is to prevent its catastrophic failure and the loss of life. The bridge may sustain extensive damage, or even be inoperable after the quake, but must not collapse or endanger lives.

3.3 Project Construction

3.3.1 Construction Schedule

Construction work would occur over one dry season (usually April 15 through October 15) for work in the creek, when the flows are minimal, plus possibly a few weeks at each end of this period for the work above at the street level. Overall work duration is expected to last for approximately eight months.

3.3.2 Site Access and Staging

To perform the retrofit construction work, bridge areas and components in the creek would need to be accessed. Access to the creek would be provided by lowering equipment, containers, and materials from the bridge deck using a crane. Construction equipment would include smaller wheeled vehicles and hand-held devices. A crane, pickup trucks, dump trucks, concrete delivery trucks, small loaders, excavators and generators would be present at the project site daily. The construction vehicles would be in and out of the work area on a steady basis but may not all be present at the same time. Storage of constructions materials, tools and vehicles would be limited to areas within the Town's right-of-way. Worker access to the creek would be over a footpath from the creek bank at either abutment.

The footprint of the bridge and approach roadways would not change in the process of the seismic retrofit and no new right-of-way for this work is needed. However, the bridge currently appears to occupy a narrow strip of land from an adjacent property on the upstream side (30 Creek Road; APN 002-024-04), as well as a small corner of the property at 12 Creek Road (APN 002-24-23). For these reasons, it is anticipated that the project would require permanent easements on both properties. In addition, temporary construction easements would be needed at 30 Creek Road and 12 Creek Road to access the creek and conduct the seismic retrofit work. Pedestrian and vehicular access to homes would be maintained at all times.

3.3.3 Site Work

The bridge would be closed for the duration of construction and traffic would be detoured to other access routes. Detours to and away from the bridge site would be available via Creek Road and Porteous Avenue in the direction away from the bridge toward Bolinas Road.

Site work would consist of the following:

1. Site preparation would begin by implementing a dewatering plan that protects aquatic resources. Where needed, the flow would be diverted around the work area by building a cofferdam upstream of the location and bypassing flowing water through a diversion pipe, keeping turbidity to a minimum. Best Management Practices (BMPs) would be implemented to avoid the migration of the sediments or contaminants into the water flow areas or drainage systems.

2. Infill walls would be constructed between each pair of columns at each of the three bridge bents in the creek. First, soils would be excavated at the bridge supports and would be lifted and stored above at the project site, likely on Wessen Lane. Excavated soils would be stored, covered, and used for backfilling after the retrofit work is complete. Groundwater intrusion into the work area would be pumped out into special containers, filtered, and placed back in the creek. Localized excavations would be required around three existing bridge bents (Bents 2, 3, and 4) to facilitate the installation of infill walls. The exact excavation configuration (i.e., fully shored versus partially sloped sidewalls) would be determined by the contractor; therefore, the larger potential excavation footprints are conservatively assumed for environmental analysis.

   At Bent 4, excavation would disturb an area of up to approximately 23 feet by 8 feet at the surface. At Bent 2 and Bent 3, excavations would be larger due to the presence of existing riprap, with maximum disturbance areas of approximately 35 feet by 15 feet and 40 feet by 15 feet, respectively.

   Excavated areas at Bents 2 and 3 would be backfilled with a base layer of rock (approximately 2.5 feet thick), overlain by native materials previously excavated and stockpiled on site.

3. At each bent, holes would be drilled into opposing column faces and fitted with epoxy-coated steel dowels. Reinforcing steel would then be installed to form a structural cage between columns, followed by placement of formwork and pouring of reinforced concrete infill walls extending from the top of the footings to the underside of the cap beam. This retrofit would effectively convert the existing two-column bents into solid wall sections to improve seismic performance. In addition, seismic restrainer cables would be installed by drilling horizontal holes through the bridge diaphragms and cap beams. Steel cables would be threaded through these elements, wrapped around the cap beams, and anchored to secure the superstructure to the substructure, thereby reducing the potential for structural unseating during a seismic event. Concrete placement would be conducted in a manner that prevents discharge to the creek and avoids contact between wet concrete and creek water or groundwater. In addition, reinforced concrete shear keys (stoppers) would be installed on the faces of the bent caps using epoxy-anchored dowels and reinforcing steel to limit lateral and longitudinal movement of the superstructure and provide additional resistance to unseating during seismic events

4. Following construction, excavated areas at Bents 2 and 3 would be backfilled with a base layer of rock riprap (approximately 2.5 feet thick), overlain with native soils to match existing creek bed elevations. At Bent 4, excavations would be backfilled with native soil only.

5. Additional improvements would include repair of deteriorated concrete elements throughout the bridge, including the underside of the deck, girders, columns, and bent cap beams. Repairs would consist of removing unsound concrete, cleaning exposed reinforcement, and applying grout or similar materials to restore structural integrity. This work would be conducted from scaffolding or lifts, with measures in place to prevent construction materials from contacting the creek bed or flowing water.

6. At both abutments, excavation of the approach roadways would occur to construct reinforced concrete “waffle slabs” designed to anchor the bridge and limit seismic

movement. Excavations would be three feet deep for a distance of 20 feet away from the ends of the bridge, with a width matching the bridge width. The waffle slabs would be backfilled with compacted soil and topped with a concrete riding surface. Construction may require relocation of existing utilities, including waterlines, and modification of an existing storm drain system. If needed, the utilities would be relocated by the Marin Municipal Water District (MMWD). An existing 12-inch diameter corrugated metal pipe storm drain crossing Creek Road and daylighting at the south creek bank would be abandoned in place and rerouted, and associated trenching and repaving would occur. Riprap would be placed at the storm drain outlet to stabilize the creek bank and prevent erosion.

7. In addition, the bridge deck would be rehabilitated by removing existing asphalt, repairing localized concrete deficiencies, sealing cracks, and replacing expansion joint seals.

At the end of the dry season all equipment, materials and temporary access ramps will be removed from the creek and the banks and creek would be restored. Upon the completion of the work in the creek, plant restoration and mitigation work would be implemented. Vegetation disturbed by or removed for construction would be replaced. The approach roadways pavement excavated for waffle slab construction would be tidied up and restriped and the road would be opened for travel.

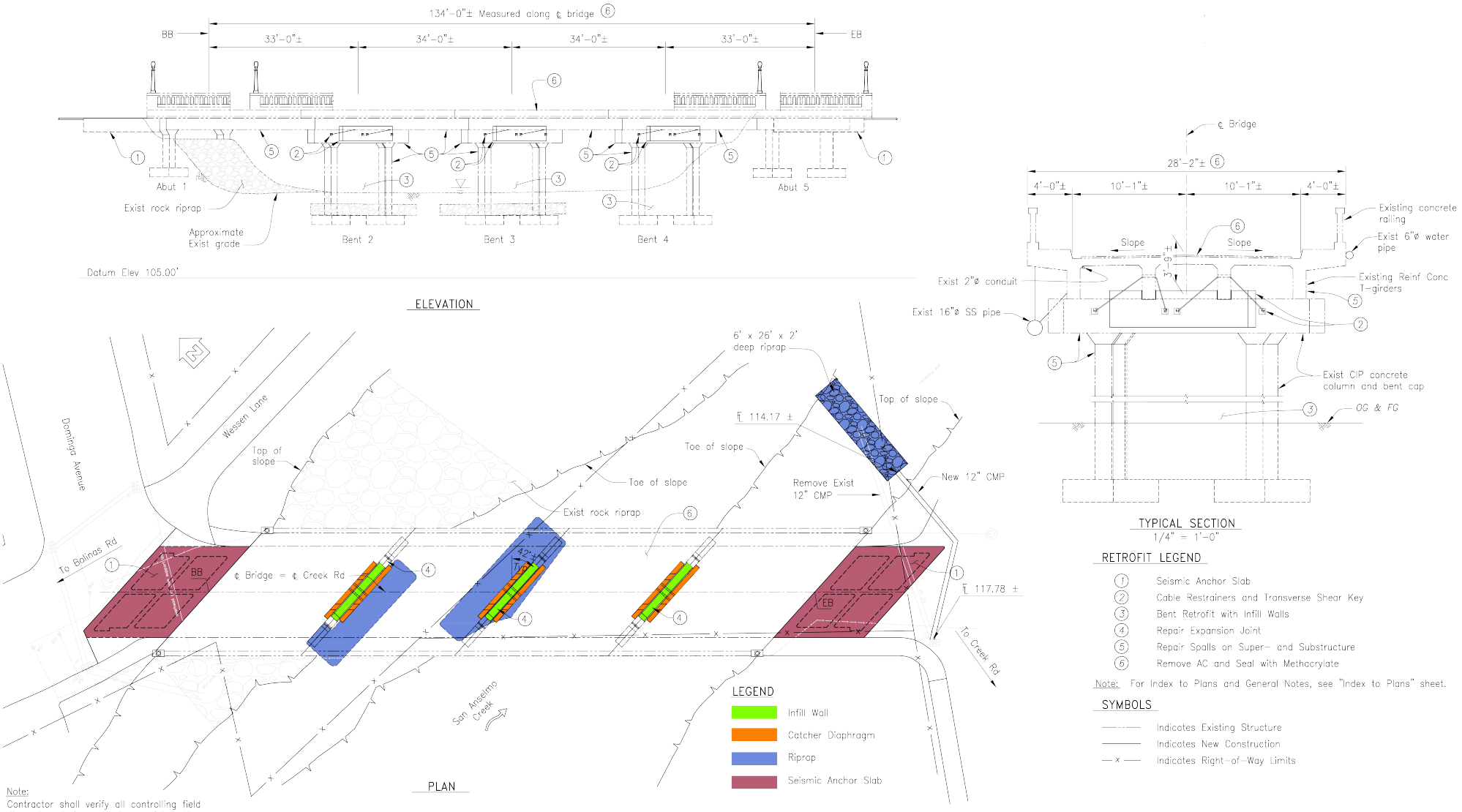


Figure 5. Creek Road Bridge Seismic Retrofit Details

Creek Road Bridge Rehabilitation Project
Town of Fairfax, California

wra Environmental Consultants

Date: January 2016 Source: CIC

3.4 Project–Related Approvals, Agreements, and Permits

The information contained in this Initial Study will be used by the Town of Fairfax (the CEQA Lead Agency) as it considers whether to approve the proposed project. If the project is approved, the Initial Study, as well as the associated Mitigated Negative Declaration would be used by the Town and responsible and trustee agencies in conjunction with various approvals and permits. These actions include, but may not be limited to, the following approvals by the agencies indicated below.

3.4.1 Army Corps of Engineers

- Clean Water Act Section 404 Form 4345, Application for Department of the Army Permit

3.4.2 California Department of Fish and Wildlife

- Section 1602 Lake and Streambed Alteration Agreement

3.4.3 Regional Water Quality Control Board

- Clean Water Act, Application for Section 401 Water Quality Certification
- Notice of Intent under the State Construction General NPDES Permit

4.0 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is potentially significant unless mitigation is incorporated, as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Public Services
☐ Agricultural Resources	☒ Hazards and Hazardous Materials	☐ Recreation
☒ Air Quality	☒ Hydrology and Water Quality	☒ Transportation
☒ Biological Resources	☐ Land Use/Planning	☒ Tribal Cultural Resources
☒ Cultural Resources	☐ Mineral Resources	☐ Utilities / Service Systems
☐ Energy	☒ Noise	☐ Wildfire
☒ Geology and Soils	☐ Population and Housing	☒ Mandatory Findings of Significance

4.1 Determination

On the basis of this initial evaluation:

☐ I find that the project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the project MAY have a "Potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Kristin Arnold _____ 4/30/2026

Signature **Date**

Name and Title: Kristin Arnold, Public Works Director

4.2 Initial Study Checklist

This section describes the existing environmental conditions in and near the project site and evaluates environmental impacts associated with the proposed project. The environmental checklist, as recommended in the CEQA Guidelines (Appendix G), was used to identify environmental impacts that could occur if the proposed project is implemented.

Each of the environmental categories was fully evaluated, and one of the following four determinations was made for each checklist question:

> **"No Impact"** means that no impact to the resource would occur as a result of implementing the project.
>
> **"Less than Significant Impact"** means that implementation of the project would not result in a substantial and/or adverse change to the resource, and no mitigation measures are required.
>
> **"Less than Significant with Mitigation Incorporated"** means that the incorporation of one or more mitigation measures is necessary to reduce the impact from potentially significant to less than significant.
>
> **"Potentially Significant Impact"** means that there is either substantial evidence that a project-related effect may be significant, or, due to a lack of existing information, could have the potential to be significant.

4.2.1 Aesthetics

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☒	☐
c)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the Project is in an urbanized area, would the Project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The project site is located within the Town of Fairfax, within a residential neighborhood adjacent to Bolinas Road and Dominga Avenue. The Creek Road Bridge is approximately 0.3 miles from the downtown center of Fairfax. At the site, the bridge spans approximately 130 feet over San Anselmo Creek.

Views of the project site are generally limited to the surrounding residential homes and streets, from residents, motorists, and pedestrians along portions of Creek Road, Dominga Avenue, and Wessen Lane. The project is entirely surrounded by single family residential land uses. San Anselmo Creek and its channel is the only other land use present within the immediate vicinity of the project area. Dense vegetation along the banks of San Anselmo Creek is visible from the project site and the trees within the creek bed shield most of the view looking southeast along the bridge towards Creek Road.

The proposed project site is located within Marin County which does not have any officially designated state or county scenic highways (Caltrans 2018). The nearest eligible state highway is Highway 37, approximately three miles northeast of the project site. The bridge is not considered historic and has a value of 5 for Historical Significance (National Bridge Inventory [NBI], Item No. 37).

DISCUSSION OF IMPACTS

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

Less-than-Significant Impact

For the purposes of this analysis, a scenic vista is defined as a vantage point with a broad and expansive view of a significant landscape feature (e.g., a mountain range, the Bay, lake, or coastline) or of a significant historical or architectural feature (e.g., views of a historic tower). Under this definition, there are no scenic vistas viewable from the project site. Views from public locations (i.e., views from residential streets, etc.) would not be significantly altered or obstructed as a result of the proposed bridge repairs. The project would have a less than significant impact regarding scenic vistas.

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

The project site is not within the vicinity of a state scenic highway. No rock outcroppings or similar recognized visual resources exist on the site, and none would be damaged through construction of the proposed project. The proposed project would not significantly alter pre-construction conditions. Views from viewer superior positions (i.e., views looking down at the project area from higher elevations such as a second story home), also would not be significantly altered as a result of the proposed project because the project's proposed bridge repairs would be below the sightline of the homes and would not stand out in comparison to existing conditions. Therefore, the project would have a less-than-significant impact on these resources.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Less-than-Significant Impact

The project site is located in a single-family residential portion of an urban area. The site is zoned for residential use. During the construction phase, views of the material stored in the proposed project site, construction equipment, and stockpiled soil would be available for brief periods. Storage of constructions materials, tools and vehicles will be limited to Wessen Lane and locations within the APE. The activities are typical of seismic retrofit strategies approved by Caltrans in developed areas and would not substantially degrade views of the existing setting. The removal of soil from the creek at the bridge supports would be stored above the project site within the designated staging/stockpile area that would be screened from public view via existing vegetation. This placement would be temporary, and the soil would be used for backfill later.

Views from public locations (i.e., views from residential streets, etc.) would not be substantially degraded as a result of the proposed seismic retrofit strategy. Upon the completion of the work in the creek, plant restoration and mitigation work will be implemented. Vegetation disturbed by or removed for construction will be replaced. The approach roadways pavement excavated for waffle slab construction will be tidied up and restriped and the road will be opened for travel.

Therefore, views would be similar to existing conditions and impacts would be less than significant.

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

The project would not create a new permanent source of light or glare. The proposed project would involve seismic retrofit of an existing bridge and no nighttime construction would be required. The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area and impacts would be less than significant.

4.2.2 Agricultural and Forestry Resources[1]

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
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?	☐	☐	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
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))?	☐	☐	☐	☒
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The project site does not contain any farmland or forestry land and is not designated for agricultural or forestry uses or Prime, Statewide, or Locally Important Farmland (California Department of Conservation [CDOC] 2022a). The proposed project is located in a semi-developed area and follows existing roads, easements, and rights-of-way. Surrounding land is developed with residential uses.

[1] *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 Dept. 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 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.*

DISCUSSION OF IMPACTS

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?

No Impact

According to the 2010 Farmland Mapping and Monitoring Program from the CDOC, the project site is located in an area that is designated as urban and built-up land and the proposed project would, therefore, have no impact on agricultural uses. No impact would occur.

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

No Impact

According to the CDOC's Williamson Act Enrollment Finder, the project site is not designated as being under a Williamson Act Contract, nor is it zoned for an agricultural use (CDOC 2022b). Therefore, no impact would occur.

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

The project site is zoned RD -5.5-7 Residential. Therefore, it would not conflict with the existing zoning for or cause rezoning of forest land, timberland, or timberland zoned Timberland Production. No impact would occur.

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

No Impact

The proposed project site is within a residential area. There is no forest land at or around the site and therefore would not result in a loss or conversion of forest land to a non-forest use.

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

The proposed project involves the construction and maintenance of existing infrastructure within an already developed area that does not include any farmland. Therefore, the proposed project would not result in the conversion of forest land or farmland to a non-forest use or a non-agricultural use and would thus have no impact on forestry or agricultural resources.

4.2.3 Air Quality

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d)	Result in other emissions (such as those leading to odors) affecting a substantial number of people?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The proposed project is located in the San Francisco Bay Area Air Basin (SFBAAB) which is within the jurisdiction of the Bay Area Air District (BAAD). Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. The potential for high pollutant concentrations developing at a given location depends upon the quantity of pollutants emitted into the atmosphere in the surrounding area or upwind, and the ability of the atmosphere to disperse the contaminated air.

The project site is located in the eastern portion of Marin County, which is bounded on the west by the Pacific Ocean, on the east by San Pablo Bay, on the south by the Golden Gate, which connects San Francisco Bay to the Pacific Ocean, and on the north by the Petaluma Gap, which is a geographical region in Sonoma County which extends in a band from the Pacific Ocean to San Pablo Bay. Air pollution potential is highest in eastern Marin County, where most of population is located in semi-sheltered valleys. In the southeast, the influence of marine air keeps pollution levels low. As development moves further north, there is greater potential for air pollution to build up because the valleys are more sheltered from the sea breeze.

While Marin County does not have many polluting industries, the air quality on its eastern side - especially along the U.S. 101 corridor - may be affected by emissions from increasing motor vehicle use within and through the county. Sources of air pollutants in the nearby vicinity of the project area include vehicle emissions and other residential activities (cooking, wood burning, and charcoal grilling; emissions associated with lawn and garden maintenance; emissions associated with application of paints and coatings; etc.). The primary sensitive receptors in the vicinity are residents, which may include children, elderly people, or people with respiratory illnesses.

Both US EPA and California have developed several ambient air quality standards (AAQS) which have become increasingly stringent over the last several decades. Although emissions and air pollution concentrations have decreased considerably, the SFBAAB is still classified as "nonattainment" with respect to standards for ozone (O3)—most of which is formed in the atmosphere by chemical reactions between reactive organic gases (ROG) and oxides of nitrogen (NO_x) rather than being emitted directly—and particulate matter (PM). The Basin is considered "non-attainment" for the O_3 (1-hour and 8-hour), PM_{10} (24-hour and AAM) and $PM_{2.5}$ (AAM) state standards.

For the proposed project, the only sources of emissions are those associated with construction; i.e., the proposed project does not involve the construction of a new air emissions source, or of developments which would attract motor vehicles with their associated air emissions. New construction equipment has been subject to increasingly stringent emissions requirements at the Federal level (e.g., 40 CFR 89 and 1039), designated "Tier 1", "Tier 2", "Tier 3", etc.; older construction equipment is subject to potential retrofit requirements required by the State of California (13 CCR 2449, 13 CCR 2450-2466, and 17 CCR 93116).

There are multiple definitions of what emissions level would be considered "significant". If a large ("major") stationary source of air pollution were proposing to locate at the project area, Federal New Source Review (NSR) regulations define "significant" emissions as being 100 tons per year (TPY) of CO or 40 TPY of ROG or NO_x.[2] For temporary activities at the project area such as construction, if the project required Federal support or approvals, General Conformity regulations would require a quantitative, formal determination of General Conformity with State Implementation Plans (SIPs) if emissions of NO_x, ROG, or CO were in excess of 100 tons per year (referred to as Federal de minimis levels).[3]

DISCUSSION OF IMPACTS

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

Less-than-Significant Impact with Mitigation Incorporated

The most recent air quality plan for the project site is the 2017 Clean Air Plan (CAP) (BAAD 2017). The CAP identifies ways to improve the air quality within the Bay Area. While the proposed project would result in a temporary increase in emissions during the construction phase, the following best management practices (BMPs), recommended by the BAAD CAP would be implemented. Therefore, due to the small area of disturbance, the temporary nature of emissions, and the implementation of the following mitigation, a less than significant impact would occur related to obstructing or conflicting with the CAP.

Mitigation Measure AIR-1. Fugitive Dust Control Measures

The BAAD recommends basic construction measures to ensure minimal impacts on regional air quality. The contractor shall be responsible for implementing the following basic measures:

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[2] *40 CFR 51.165(a)(1)(x)(A); 51.166(b)(23)(i); 52.21(b)(23).*

[3] *Separately, Federal regulations for General Conformity identify "routine maintenance and repair activities, including repair and maintenance of administrative sites, roads, trails, and facilities" as "actions which would result in…an increase in emissions that is clearly de minimis" [40 CFR 93.153(c)(2)(iv)]*

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas) shall be watered two times per day, as appropriate; pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking area and staging areas.
- All paved access roads, parking areas and staging areas at the construction site shall be swept daily with water sweepers. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications, and all equipment shall be checked by a certified visible emissions evaluator.
- A publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints shall be posted in or near the project area. The contact person shall respond to complaints and take corrective action within 48 hours. The BAAD's phone number shall also be visible to ensure compliance with applicable regulations.

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

Less-than-Significant Impact

As mentioned in the Environmental Setting, the project area is non-attainment with respect to AAQS for ozone and particulate matter. The BAAD 2017 Clean Air Plan addresses these AAQS and evaluates cumulative impacts by considering emissions from all sources and projecting future activity. As described above in response to questions 4.3 (a) and (b), the emissions from the proposed project are negligible compared with other emissions in the air basin and are also temporary in nature. After implementation of the BMPs, the temporary increase in air pollutant emissions associated with construction activities would result in less than significant contributions to cumulative pollutant levels in the region.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less-than-Significant Impact with Mitigation Incorporated

The primary sensitive receptors in the vicinity are residents, which may include children, elderly people, or people with respiratory illnesses. Sensitive receptors are located in close proximity to several locations along the construction area. However, construction activities would be limited to the bridge area, fugitive dust will be minimized (per the BMPs listed above), and construction equipment is mobile (dispersing and diluting pollutants over a wider area than if they were fixed in place). New construction equipment has been subject to increasingly stringent emissions requirements at the Federal level (e.g. 40 CFR 89 and 1039), designated "Tier 1", "Tier 2", "Tier 3", etc.; older construction equipment is subject to potential retrofit requirements required by the

State of California (13 CCR 2449, 13 CCR 2450-2466, and 17 CCR 93116). Basic construction air quality measures as recommended in Mitigation Measure AIR-1 would be implemented throughout project construction. These measures would reduce dust generation and construction equipment emissions. As a result, sensitive receptors in the vicinity of the proposed project would not be exposed to substantial pollutant concentrations, and impacts would be less than significant.

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

Less-than-Significant Impact

BAAD's CEQA Guidelines identify the following as potential sources of objectionable odors: wastewater treatment plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries, and chemical plants. The proposed project does not involve construction of any of those types of facilities. Construction activities would involve the use of diesel-powered equipment that emits exhaust gases and particulate matter, which can emit pollutants that have objectionable odors. However, construction equipment is mobile (dispersing and diluting pollutants over a wider area than if they were fixed in place). Therefore, odor-creating emissions related to the project would not adversely affect a substantial number of people. Thus, a less than significant impact would occur.

4.2.4 Biological Resources

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
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 Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
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?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
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?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The analysis of potential biological impacts is based on the Natural Environment Study (NES) (Appendix A) and Biological Assessment (BA) (Appendix B) prepared for the proposed project. Kelly Biological Consulting and WRA, Inc. (WRA) jointly prepared the NES and BA, which were approved by Caltrans. The documents jointly outline vegetation communities present, suitability of on-site habitat for special-status plant and wildlife species, and the presence of jurisdictional wetlands and “other waters”. The studies were conducted through a combination of seven site

visits and a review of databases and available literature within the proposed Biological Study Area (BSA).

The project site encompasses the Creek Road Bridge over San Anselmo Creek in the Town of Fairfax, Marin County, California. Site elevations range from approximately 100-150 feet and surrounding land uses are primarily residential. Most of the creek bank (below the top of bank) is densely vegetated with English ivy, California blackberry, and Himalayan blackberry. Unvegetated areas are bare dirt or are covered with large rock riprap. With the exception of one small gravel bar, the creek bed is generally unvegetated.

The principal natural hydrological sources for the project site are creek flows, direct precipitation and surface run-off from adjacent lands. San Anselmo Creek flows though the project site towards the north/northeast. Just north of the project site, Deer Creek joins San Anselmo Creek. Roughly one quarter of a mile to the north, it joins Fairfax Creek and turns east, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. In wet years, the creek at this location is perennial. At the time of the fieldwork, in a drought year, the flows were low.

Biological Study Area

The BSA is located on and around the Creek Road Bridge over San Anselmo Creek in the Town of Fairfax, Marin County, California. The BSA covers all areas where direct and indirect impacts would occur such as ground-disturbance, construction staging, access roads, and noise disturbances. The BSA is extended beyond areas of the proposed project footprint or direct impacts to ensure that key biological issues are addressed. Creek Road is a local road in a developed area. The adjacent land use is residential (single family homes). The BSA extends up and downstream from the bridge along the stream corridor covering the only natural area.

Site elevations range from approximately 100 to 150 feet NAVD88. The bridge is located on the San Rafael USGS 7.5-minute quadrangle map at latitude W37.585932, longitude N122.352612.

Natural Communities

Riparian Woodland

The BSA consists of a mature closed canopy Riparian Woodland similar to California Bay (*Umbellularia Californica*) Forest Alliance. The Riparian Woodland community is considered a natural community of special concern (sensitive). Overstory species include native tree species such as big-leaf maple (*Acer macrophyllum*), California bay, and California walnut (*Juglans californica*). The understory is comprised mainly of California blackberry *(Rubus ursinus)*, Himalayan blackberry (*Rubus armeniacus*), English ivy (*Hedera helix*), and various grasses including panic veldtgrass (*Ehrharta erecta*) and wall barley (*Hordeum murinum* ssp. *murinum*). Several small diameter white alders (*Alnus rhombifolia*), big-leaf maples, a young buckeye (*Aesculus californica*), and some sparse arroyo willow (*Salix lasiolepis*) (planted during 2005 bank work) make up the shrub and tree part of the understory. The small, scattered alders and willows are indicative of a riparian community. In the project site, the community would be considered a woodland rather than a riparian zone because of the scattered and sparse occurrence of these species.

Ruderal Disturbed/Developed

The Ruderal Disturbed/Developed portions of the BSA include the roadsides, landscaping, gravel and bare dirt areas, as well as paved areas and structures. Within the project side, this plant community is predominately non-native herbaceous species commonly found in the region, such as sorrel (*Oxalis incarnata* and *O. pes-carpe*), narrow-leaved vetch (*Vicia sativa* ssp. *nigra*), various clovers (*Trifolium* spp.), wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), and Canary reed-grass (*Phalaris canariensis*). The roadside vegetation includes a small stand of coyote brush (*Baccharis pilularis*) on the northern top of bank.

Perennial Stream (Comprised of "Other Waters" and Wetlands)

San Anselmo Creek is a perennial creek with flows that vary with the rainfall patterns of a given season. The watershed that supports it is a local area, primarily the western part of the Town of Fairfax and adjacent open space lands. Flows within the creek at the time of the site visit in the spring of 2015 were low; only a few inches of water remained within a low flow channel that narrowed to several feet in places, though several deeper pools persist year-round in the BSA. Wrack observed at the edge of the creek bed was used as an indication of Ordinary High Water Mark (OHWM). Creek substrate consists of small gravel to larger cobble. The channel width at the OHWM was used to determine the "other waters" boundary. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior.

A 7-foot by 3-foot wetland area occurs on a gravel bar within the creek bed. The dominant vegetation found here includes hoita (*Hoita macrostachya*), fig (*Ficus carica*), alder (*Alnus rhombifolia)*, and Himalayan (aka Armenian) blackberry (*Rubus armeniacus*) (FACU). The soils are silty sand with 1-3 inches cobble and a chroma of 10YR3/2.

Pursuant to the Clean Water Act Section 404 and 401 the creek below OHWM including the wetland would be within the U.S. Army Corps. of Engineers (Corps) and Regional Water Quality Control Board (RWQCB) jurisdiction. These areas are also considered Waters of the State per the Porter-Cologne Water Quality Control Act. There are no areas within the BSA that would be considered Waters of the State that are not Waters of the US. The portion of the creek channel that is vegetated with hydrophytic species is a jurisdictional wetland the rest is "other waters". In total, <0.001 acre (20 square feet, approximately 25 linear feet) of permanent impacts and 0.075 acre (3,265 square feet, approximately 275 linear feet) of temporary impact to potentially jurisdictional "other waters" (creek bed) are proposed. The proposed project would result in less than 0.001 acre (22 square feet) of temporary impacts and no permanent impacts to wetlands.

Unvegetated Bank

The banks under the existing bridge are generally unvegetated. The western bank consists of rock riprap. The eastern bank is made up of exposed bedrock and bare dirt.

Special-Status Species

Database searches indicate that 76 special-status plant species and 101 special-status wildlife species have been documented in or have a range that occurs in the San Rafael, Bolinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, or Point Bonita 7.5-minute USGS quadrangles. Of these species, 31 special-status plant species and 13 special-status wildlife species have documented occurrences within 8 kilometers (5 miles) of the BSA.

Special-Status Plant Species

Due to a lack of appropriate habitat elements (such as coastal salt marsh) and the presence of residential development in the surrounding landscape, the project site has the potential to support only 11 of the special-status plant species:

- **Napa false indigo** (*Amorpha californica var. napensis*, CNPS 1B.2). Woodland habitat within the project could support this species. However, this shrub species, which is easily identifiable, was not observed during the field surveys.
- **Bent-flowered fiddleneck** (*Amsinckia lunaris*, BLMS, CNPS 1B.2). Woodland habitat within the project site could support this species. However, it may be too shady. This perennial species was not observed within the project site. If it was present, it would have been identified during the field surveys, which were conducted during the flowering period.
- **Western leatherwood** (*Dirca occidentalis*, CNPS 1B.2). Woodland habitat within the project site could support this species. However, this woody shrub species, was not observed during the field surveys, which were conducted during the flowering period.
- **Minute pocket moss** (*Fissidens pauperculus*, USFSS, CNPS 1B.2). Mesic substrates within the project site could support this species. However, the site is not in coniferous forest, a typical requirement for this species. This species was not observed during the field surveys which occurred during the appropriate wet season.
- **Marin checker lily** (*Fritillaria lanceolata var. tristulis*, CNPS 1B.1). Though not coastal, there is riparian habitat within the project site. No *Fritillaria* (a perennial bulbiferous herb) were observed during the field surveys, which were conducted during the flowering period.
- **Diablo helianthella** (*Helianthella castanea*, CNPS 1B.2, BLMS). The project site is disturbed, though has low quality habitat present. No *Helianthella* were observed during the field surveys, which were conducted during the flowering period.
- **Thin-lobed horkelia** (*Horkelia tenuiloba*, CNPS 1B.2, BLMS). The only mesic soils within the project site are in the of the creek. These areas provide limited habitat for this species. Though high flows would likely damage plants. This species was not observed during the field surveys, which were conducted during the flowering period.
- **Marsh microseris** (*Microseris paludosa*, CNPS 1B.2). Typically this species occurs in closed cone coniferous forest or cismontane woodland in mesic areas. The project site provides marginal disturbed habitat. However, this species was not observed during the field surveys, which were conducted during the flowering period.
- **North coast semaphore grass** (*Pleuropogon hooverianus*, BLMS, ST, CNPS 1B.1). This species occurs in moist, open to shaded areas, broadleafed upland forest, meadows and seeps. The site provides marginal habitat, but high creek flows and seasonal drying of the creek bed limit the habitat. This species was not observed during the field surveys, which were conducted during the flowering period.
- **Tamalpais oak** (*Quercus parvula* var. *tamalpaisensis*, CNPS 1B.3). Though, the project site provides woodland habitat, this species is a woody shrub, which would have been identifiable during the site visits. No shrubby oaks were observed during the field surveys.

- **Santa Cruz microseris** (*Stebbinsoseris decipiens*, CNPS 1B.2). This species occurs in open areas in broadleafed upland forest and other habitats. The only open area is the top of the bank, which is heavily disturbed. Most of the vegetation found there was ruderal and non-native. This species was not observed during the field surveys, which were conducted during the flowering period.

The remaining special-status plant species documented in the vicinity are unlikely to occur in the project site based on lack of suitable habitats or specific substrates. No special-status plant species were observed within the project site during floristic surveys completed during the appropriate flowering periods. It is therefore unlikely that there are special-status plant species present within the project site.

Special-Status Wildlife Species

The BSA is designated as critical habitat for both Central California Coast (CCC) steelhead and Coho salmon (*O. kisutch*). Steelhead have been documented and are presumed present within this section of San Anselmo Creek. Coho salmon is considered extirpated because they no longer spawn or occur within tributaries and waters of San Francisco Bay. The project site is also listed as Essential Fish Habitat (EFH) for Coho salmon and Chinook salmon (*O. tshawytscha*); though neither species occurs in the watershed. In addition to steelhead, based on habitat and conditions within the project site and considering documented occurrences nearby, the project site has potential to support non-special status bird species and six other special-status wildlife species. These species are detailed below.

- **Allen's hummingbird** (*Selasphorus sasin*, USFWS Bird of Conservation Concern). Allen's hummingbird is found in a wide variety of habitats that provide nectar-producing flowers. The species is considered a common breeder throughout much of the San Francisco Bay area.
- **Rufous hummingbird** (*Selasphorus rufus*, USFWS Bird of Conservation Concern). The rufous hummingbird is a common migrant and uncommon summer resident in California. It occurs in a wide variety of habitats as long as they provide abundant nectar sources.
- **Purple martin** (*Progne subis*, CDFW Species of Special Concern). The purple martin is an uncommon summer resident in California, occurring in woodlands and low-elevation hardwood and coniferous forest. It usually feeds on insects captured in flight 100-200 feet above ground. The purple martin nests in cavities often located in tall, isolated trees or snags in open forest or woodland.
- **Olive-sided flycatcher** (*Contopus cooperi*, CDFW Species of Special Concern, USFWS Bird of Conservation Concern). This species if found within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g. meadows, canyons, or rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands (Altman 2000).
- **Oak titmouse** (*Baeolophus inornatus*, USFWS Bird of Conservation Concern). This relatively common species is year-round resident throughout much of California including most of the coastal slope, the Central Valley and the western Sierra Nevada foothills. Its primary habitat is woodland dominated by oaks. Local populations have adapted to woodlands of pines and/or junipers in some areas (Cicero 2000). The oak titmouse nests in tree cavities, usually natural cavities or those excavated by

woodpeckers, though they may partially excavate their own (Cicero 2000). Seeds and arboreal invertebrates make up the birds' diet.

- **Nuttall's woodpecker** (*Picoides nuttallii*, USFWS Bird of Conservation Concern). Nuttall's woodpecker typically reside in lowland woodlands throughout California, west of the Sierra Nevada. This species is associated with intact oak and riparian woodlands, rarely in conifers, and is a primary cavity nester.

REGULATORY SETTING

Federal Regulations

Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), was enacted to provide a means to identify and protect endangered and threatened species. Under Section 9 of the ESA, it is unlawful to take any listed species. "Take" is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting a listed species. "Harass" is defined as an intentional or negligent act or omission, which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering. "Harm" is defined as an act which actually kills or injures fish or wildlife and may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering.

Actions that may result in "take" of a federal-listed species are subject to USFWS or National Marine Fisheries Service (NMFS) permit issuance and monitoring. Section 7 of ESA requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat for such species. Any action authorized, funded, or carried out by a federal agency or designated proxy (e.g., Caltrans) which has potential to affect listed species requires consultation with the USFWS or the NMFS under Section 7 of the ESA.

Clean Water Act (CWA)

The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 identifies the Corps' jurisdiction over fill materials in essentially all water bodies, including wetlands. All federal agencies are required to avoid impacts to wetlands whenever there is a practicable alternative. Section 404 established a permit program administered by the Corps regulating the discharge of dredged or fill material into Waters of the US (including wetlands). Section 401 of the CWA requires that an applicant for a federal license or permit that allows discharge to Waters of the U.S. obtain a state certification that the discharge complies with the CWA. The Regional Water Quality Boards (RWQCB) administer the certification program in California. The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Executive Order 11990 – Protection of Wetlands

This order established a national policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. The U.S. Department of Transportation (DOT) promulgated DOT Order

5660.1A in 1978 to comply with this direction. On federally funded projects, impacts to wetlands must be identified. Alternatives to the Creek Road Bridge Seismic Retrofit that avoid wetlands therefore must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding. An additional requirement is to provide early public involvement in projects affecting wetlands. The Federal Highway Administration (FHWA) provides technical assistance (Technical Advisory 6640.8A) and reviews environmental documents for compliance.

Migratory Bird Treaty Act

This treaty with Canada, Mexico, and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. California Fish and Game Code (Sec 3500) also prohibits the destruction of any nest, egg, or nestling.

State Regulations

California Porter-Cologne Water Quality Control Act

This regulatory law is becoming more prominent on projects involving impacts to isolated Waters of the State (non-404/401 waters). The RWQCB is increasingly requiring Waste Discharge Requirement (WDR) permits for impacts to Waters of the State.

Streams, Lakes, and Riparian Habitat in California

Streams and lakes, as habitat for fish and wildlife species, are subject to the jurisdiction of California Department of Fish and Wildlife (CDFW) under Sections 1600-1616 of California Fish and Game Code. Alterations to, or work within or adjacent to streambeds or lakes generally require a 1600 series Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72).

In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Lake and Streambed Alteration Agreement from CDFW.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

California Endangered Species Act

CDFW is responsible for administering California Endangered Species Act (CESA, CDFG Code §§2050, et seq.), which prohibits take of species that have been listed, or are considered for listing (candidate species) as threatened or endangered species within the State of California. CESA allows for incidental take of state listed species through issuance of an Incidental Take Permit, or through a Consistency Determination in coordination with a Biological Opinion issued by the USFWS (CDFW Code Section 2081). In contrast with federal law, the definition of "take" under CESA involves actual harm to one or more members of a listed species and does not extend to modification of habitat not involving direct take.

Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the Federal Endangered Species Act (ESA) or California Endangered Species Act (CESA). These acts afford protection to both listed and proposed species. In addition, CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are all considered special-status species.

Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under CEQA. In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, or young is illegal. Plant species on the CNPS Rare and Endangered Plant Inventory with California Rare Plant Rank of 1 or 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2026). Sensitive plant communities are also identified by CDFW. CNDDB vegetation alliances are ranked 1 through 5, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

Local Regulations

Tree Protection Ordinance

In 1973, the Town of Fairfax approved Ordinance No. 387 for trees. The purpose of the ordinance is to preserve the wide variety of local native trees and to protect the benefits they provide the citizens. Chapter 8.36.020 of the Town Code defines "altering" and "tree." A Tree Permit is required for removal or significant trimming of any tree, which has a circumference of 24 inches

or more measured at 24 inches above the ground. In effect, this is a little less than an 8-inch diameter tree trunk.

DISCUSSION OF IMPACTS

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) or United States Fish and Wildlife Service (USFWS)?

Less-than-Significant Impact with Mitigation Incorporated

Special-Status Plants

Due to a lack of appropriate habitat elements (such as coastal salt marsh) and the presence of residential development in the surrounding landscape, it was determined that the project site has the potential to support 11 special-status plant species. However, no special-status plants were observed in the project site during the site assessments conducted for this report. Given these assessments were conducted during the appropriate blooming seasons and no special-status plants were observed, it is unlikely that special-status plants are present in the project site. Thus, there would be no impact to special-status plant species.

Special-Status Wildlife

The project site contains potential habitat for steelhead and six special-status bird species. Sensitive habitat within the project site is limited to San Anselmo Creek, which is a perennial waterway. San Anselmo Creek is potentially subject to the Corps, RWQCB, and the CDFW jurisdiction. The project site also has potential to support non-special-status nesting birds. These species and their potential for occurrence within the project site are discussed in further detail below.

Impact BIO-1: Special-Status Wildlife Species

The project would have the potential to create a substantial adverse effect on special-status fish and bird species. These impacts are discussed below and would be less than significant with mitigation incorporated.

Impact BIO-1a: Steelhead and Coho Salmon, and EFH

The project site is designated as critical habitat for both CCC steelhead and Coho salmon (*O. kisutch*). Coho salmon are considered extirpated from the tributaries and waters of San Francisco Bay, therefore, no mitigation is required for this species. However, steelhead are presumed present within this section of San Anselmo Creek. The project site is also listed as EFH for Coho salmon and Chinook salmon (*O. tshawytscha*); however, neither species occurs in the watershed.

Approximately, 0.005 acre (199 square feet) of permanent impacts and 0.086 acre (3,738 square feet) of temporary impacts to steelhead, critical habitat, and EFH. Critical habitat and EFH are considered Riparian Woodland, Perennial Stream, and Unvegetated Bank habitats within the project site. Temporary, direct impacts to the creek would occur as a result of temporary dewatering and trenching within the creek bed for modifying bent footings. As described in *Section 3.0, Project Description*, a dewatering plan that protects aquatic resources would be required of the Contractor and reviewed and implemented. Where needed, the flow would be

diverted around the work area by building a cofferdam upstream of the location and bypassing flowing water through a diversion pipe, keeping turbidity to a minimum. BMPs would be implemented to avoid the migration of the sediments or contaminants into the water flow areas or drainage systems. Infill walls would be constructed between each pair of existing columns at each of the bridge bents. Infill walls would result in the permanent fill of 0.002 acre (78 square feet) of Unvegetated Bank and Perennial Stream habitats.

Project construction would result in temporary impacts to steelhead; however, no permanent impacts are anticipated. The bridge work would add material to the existing structures but would not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream. Riprap would be placed within the riparian woodland habitat to prevent further erosion of the banks at the storm drain outfall and would not enter the creek bed. The stream channel and banks would be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists.

Restoration would use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. As such, the project would not change fish passage conditions. Temporary impacts to steelhead are anticipated during project activities. Although the project would result in a minor loss of habitat for this species, it is anticipated to be negligible and would not result in an adverse impact to steelhead or its critical habitat because fish passage conditions would remain unchanged and the project site does not contain spawning or rearing habitat. Therefore, the project may affect but is not likely to adversely affect steelhead and critical habitat.

The project would not result in any changes to existing land use; and the project site would be restored to conditions similar to those before the project. Therefore, no indirect effects would occur.

Mitigation Measure BIO-1a: Steelhead and EFH

Habitat within the project site is critical habitat for both Coho salmon and steelhead. As mentioned above, while Coho salmon are considered extirpated, steelhead are considered present. In addition to the measures identified for the Perennial Stream Biological Community; the following measures shall be implemented to avoid and minimize potential project impacts to steelhead, critical habitat for steelhead, and EFH.

- Consultation with NMFS shall be conducted to ensure project design would not result in a permanent adverse effect to steelhead or critical habitat.
- Work within the channel shall be conducted during the dry season (June 1 through October 31) to avoid disrupting the adult migration cycle. Work outside of this period shall require consultation with NMFS.
- Work should be conducted in isolation from flowing water. Prior to the start of construction activities, the work area should be isolated, and flowing water should be diverted around the isolated area.
- A fish salvage plan shall be developed prior to the onset of any in-water work. The plan shall be implemented by a qualified biologist during dewatering activities in San Anselmo Creek. The fish salvage plan shall include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish salvage during dewatering activities.

- Prior to construction, the contractor shall be required to prepare an Accidental Spill Prevention and Cleanup Plan. This plan shall include required spill control absorption material, for use beneath stationary equipment, to be present on-site and available at all times.
- Silt fencing or other approved sediment trapping shall be installed down gradient of the work site to minimize off-site transport of sediments.
- All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, refueling and maintenance, shall occur outside the creek channel. No equipment would be washed where runoff could enter the creek.
- No motorized equipment shall be left within the channel (top of bank to top of bank) overnight unless a container or similar method is securely placed beneath the equipment to catch any fluid leakage. All contained fluids shall be disposed of in a permitted manner.
- The contractor shall be required to use a drilling mud and slurry seal that is nontoxic to aquatic life if there are drilling activities related to construction of the proposed project. All drilling muds and fluid shall be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities shall be collected and not allowed to flow into the creek.
- The creek banks shall be restored to pre-project conditions following the completion of work.
- The creek channel shall be restored to the original grade using native cobble, gravel, and soils in appropriate ratios to mimic pre-project conditions.

Impact BIO–1b: Nesting Birds and Avian Species

The project site contains potential nesting habitat for special-status and non-special-status breeding birds. Although this habitat would not be lost as a result of the project, construction activities could result in direct impacts to active nests, and construction noise could result in indirect impacts to active nests. The project site would be restored to pre-project conditions, and as such, no permanent direct impacts to nesting birds are expected. Given that the project would not result in any changes to existing land use and that the project site would be restored to pre-project conditions, no indirect effects would occur.

Mitigation Measure BIO–1b: Nesting Birds and Avian Species

Although potential nesting habitat for breeding birds would not be lost as a result of the project, construction could disturb active nests. The following measures shall be implemented to avoid and minimize potential impacts to special-status, and non-special-status nesting bird species:

- If project activities begin between February 15 and August 31, pre-construction surveys shall be conducted by a qualified biologist prior to ground disturbance to determine whether active nests containing eggs, chicks, or young are present beneath the bridge and in the surrounding riparian area. Pre-construction surveys for active nests shall be conducted no more than 14 days prior to ground disturbing activities.
- If active nests containing eggs, chicks, or young are not observed during pre-construction surveys, construction can proceed.

- If active nests containing eggs, chicks, or young are observed, a qualified biologist shall establish an exclusion zone of 25-100 feet for passerine birds and 200-500 feet for raptors, depending on the species. Appropriate exclusion distances shall be determined by a qualified biologist based on the species present and location of the nest relative to construction activities (e.g., the nest is sufficiently shielded from construction to avoid disturbance). The exclusion zone shall be marked with high visibility fencing and monitored weekly to ensure no encroachment. Ground-disturbing activities within these zones shall be prohibited until the qualified biologist confirms that the nests are no longer active. If an active nest is found after the completion of the pre-construction surveys or after construction begins, all construction activities shall stop until a qualified biologist has evaluated the nest and determined an appropriate buffer to be placed around the nest. If avoidance of a buffer zone is not feasible, CDFW shall be contacted to coordinate an appropriate course of action.

After implementation of the above avoidance and mitigation measures, impacts to special-status species, including migratory birds, would be less than significant.

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

Three natural communities of special concern are present within the project site, Riparian Woodland, Perennial Stream (comprised of "Other Waters" and Wetlands), and Unvegetated Bank. The Unvegetated Bank is not itself a sensitive natural community but is included in discussion of impacts to sensitive natural communities because it is part of the federally designated Critical Habitat for two species, CCC steelhead and Coho salmon. The "other waters" and wetlands are also considered sensitive by both federal and state agencies.

As summarized in Table 1 and Table 2, the project would temporarily impact 35 square feet (less than 0.01 acre) of Riparian Woodland, 3,287 square feet (less than 0.07 acre) of Perennial Stream (comprised of 22 square feet (less than 0.01 acre) of wetlands and 3,265 square feet of "other waters" (less than 0.07 acres), and 416 square feet (0.01 acre) of Unvegetated Bank habitats. It would permanently impact 121 square feet (less than 0.01 acre) of Riparian Woodland, 20 square feet (less than 0.01 acre) of Perennial Stream (all "other waters", no wetland), 58 square feet (less than 0.01 acre) of Unvegetated Bank, and 805 square feet (0.02 acre) of Ruderal Disturbed/Developed lands.

Areas of temporary impacts would be revegetated following construction where appropriate. To the extent feasible, areas amid or adjacent to the rock used to stabilize the storm drain would be revegetated with appropriate native species. There is one small (<6" DBH) alder near the rock work. The alder would be avoided if possible. If it must be removed, it would be replaced on-site. No other permanent or temporary impacts to alders or willows are proposed.

Table 1. Proposed Project Direct Impacts to Natural Communities of Special Concern

NATURAL COMMUNITY OF SPECIAL CONCERN	PERMANENT IMPACTS	TEMPORARY IMPACTS
Riparian Woodland	0.003 acre (121 ft^2)	<0.001 acre (35 ft^2)
Perennial Stream		
"Other Waters"	<0.001 acre (20 ft^2)/ 25 linear feet	0.075 acre (3,265 ft^2)/ 275 linear feet
Wetlands	0.0 ft^2	<0.001 acre (22 ft^2)
Unvegetated Bank (included here because it is considered part of the federal-designated Critical Habitat for CCC steelhead and Coho salmon.)	0.001 acre (58 ft^2)	0.010 acre (416 ft^2)
Total (and Total for Critical Habitat for CCC steelhead and Coho salmon.)	0.005 acre (199 ft^2)	0.086 acre (3,738 ft^2)

Table 2. Proposed Project Direct Impacts to Jurisdictional Areas by Agency

AGENCY JURISDICTION	PERMANENT IMPACTS	TEMPORARY IMPACTS
CDFW (Riparian woodland, unvegetated bank, and creek bed)	0.005 acre (199 ft^2)	0.086 acre (3,738 ft^2)
Corps and RWQCB (creek bed)	<0.001 acre (20 ft^2)	0.075 acre (3,287 ft^2)
NMFS (Riparian woodland, unvegetated bank, and creek bed because of critical habitat)	0.005 acre (199 ft^2)	0.086 acre (3,738 ft^2)

Impact BIO–2: Sensitive Habitat

Appendix A, Figure 3b shows the areas of the project's impacts. The following sections present a discussion of the impacts and mitigation for each natural community of special concern. Permanent impacts are a conversion of a natural community to structures such as bridge support or to an area of engineered slope stabilization. Temporary impacts are disturbances to existing natural communities that would be restored to the same natural community type following construction (such as dewatering).

Impact BIO-2a: Riparian Woodland

The area of Riparian Woodland impacted by the project is minor in the context of the surrounding landscape and relative abundance of this community in Marin County. Approximately 0.64 acre of Riparian Woodland is present in the project site (Appendix A, Figure 3a).

As summarized in Table 1 above, 0.003 acre of permanent impacts and <0.001 acre of temporary impacts to Riparian Woodland are unavoidable as a result of project construction. Temporary

direct impacts to Riparian Woodlands would result from tree trimming, if needed, for construction access. These areas would be revegetated following construction activities. Minor temporary indirect impacts to Riparian Woodlands would result from construction activities including increased dust deposition on adjacent vegetation. Permanent impacts would occur when the storm drain outfall is replaced and stabilized with rock.

Mitigation Measure BIO–2a: Riparian Woodland

The following avoidance and minimization measures shall be employed to avoid or minimize impacts to riparian woodland:

- Temporarily impacted areas in this habitat shall be revegetated with native, non-invasive plants suitable for the soil and site conditions.
- Silt fencing or other approved sediment trapping shall be installed down gradient of the work site to minimize off-site transport of sediments.
- Exclusion fencing shall be installed along the limits of clearing and grubbing to prevent encroachment into undisturbed habitats.

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

Less-than-Significant Impact with Mitigation Incorporated

As summarized in Table 1 above, less than 0.001 acre (20 square feet, approximately 25 linear feet) of permanent impacts and 0.075 acre (3,265 square feet, approximately 275 linear feet) of temporary impacts to potentially jurisdictional "other waters" (creek bed) are proposed. Less than 0.001 acre (22 ft^2) of temporary impacts and no permanent impacts to wetlands are proposed. Implementation of the following mitigation measures alongside compliance with applicable CDFW and Corps permits would reduce impacts to less-than-significant levels. Impacts to state and federally protected wetlands would therefore be less than significant with mitigation incorporated.

Impact BIO-3: Perennial Streams and Wetlands

Temporary, direct impacts to the creek would occur as a result of temporary trenching within the creek bed for modifying bent footings and during dewatering. Cofferdams would be constructed in the creek to temporarily dewater the project area. Infill walls would be constructed between each pair of columns at each of the bridge bents. Infill walls would result in the permanent fill within the creek bed.

Temporary, indirect impacts may occur if construction-related sediment enters creeks within the project site. However, implementation of construction BMPs described in Mitigation Measure BIO-3 would ensure such impacts are avoided.

The proposed project primarily involves short-term, temporary impacts and would not disrupt connectivity in the region. The creek channel would be restored to conditions similar to pre-project conditions which would allow for continued fish passage following the completion of work.

Potentially significant impacts would be reduced to a less-than-significant level through implementation of Mitigation Measure BIO-3.

Mitigation Measure BIO-3: Perennial Stream and Wetlands: Creek Habitat

The following measures are included to avoid and/or minimize and restore potential impacts to creek habitat resulting from the use of mechanical equipment in the creek bed.

- The construction contractor shall ensure all in-stream construction work is completed during the dry season, between April 15 and October 15. Work outside of this period shall require written approval from the CDFW and RWQCB, and any additional mitigation measures prescribed shall be implemented.
- Final grading in the creek bed shall conform to the existing creek channel both downstream and upstream, and existing bed materials shall be replaced with similar sized materials.
- Regulatory approval shall be obtained for all work within potentially jurisdictional areas, including approval from the Corps, RWQCB, CDFW, and NMFS. All work within these areas shall conform to any conditions imposed by the regulating agencies.
- Prior to any clearing, grubbing, pruning, or groundbreaking activity, the limits of construction shall be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas, including all riparian or wetland vegetation and prevent any equipment from unnecessarily extending the work area or entering the wetted channel. In addition, silt fencing shall be installed at the base of the construction fencing to prevent debris from entering the creek. All fencing shall be removed upon project completion.
- Prior to construction, the contractor shall be required to prepare an Accidental Spill Prevention and Cleanup Plan. This plan shall include required spill control absorbent material, for use beneath stationary equipment, to be present on-site and available at all times.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material shall be in place underneath this equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, shall occur outside the creek's top-of-bank. Any hazardous chemical spills shall be cleaned immediately.
- All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, refueling and maintenance, shall occur outside the creek channel. No equipment shall be washed where runoff could enter the creek.
- No motorized equipment is to be left within the channel (top of bank to top of bank) overnight unless a container or similar method is securely placed beneath the equipment to catch any fluid leakage. All contained fluids shall be disposed of in a permitted manner.
- The contractor shall be required to use a drilling mud and slurry seal that is nontoxic to aquatic life if there are drilling activities related to construction of project. All drilling muds and fluid shall be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities shall be collected and not allowed to flow into the creek.

- No equipment, including concrete trucks, shall be washed within the channel of the creek, or where wash water could flow into the channel. Prior to project construction, the contractor shall establish a concrete washout area for concrete trucks in a location where wash water shall not enter the creek or adjacent areas. The washout area shall follow the practices outlined in the San Francisco Bay Regional Water Quality Control Board Erosion and Sediment Control Field Manual (page 107-108, July 1999) or equivalent guidelines. Substitution of the designated concrete washout area or methods shall require prior approval of the Town of Fairfax.
- All water that comes in contact with wet concrete must be pumped directly into tanks and disposed of at a permitted location.
- If work is to occur on the roadway and bridge approaches during the period October 15 to June 15, all drainage inlets within the project site shall be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- Water encountered during construction of the bridge foundations shall be managed in accordance with an approved dewatering plan.
- All workers shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project site are deposited in covered or closed trash containers. The trash containers shall not be left open and unattended overnight.
- The Town of Fairfax shall require that all disturbed areas around the bridge bents and abutments be re-graded to match the surrounding topography by October 15. Seed and certified weed-free straw shall be placed on disturbed areas in the project site (with the exception of the lower creek banks, creek bed, and areas below the OHWM). A jute mesh type or equivalent matting shall be placed over the straw, installed per the manufacturer's instructions. This matting shall have no plastic incorporated into it. Substitution of materials or erosion control methods shall require prior approval of the Town of Fairfax.
- After construction, the project site shall be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season. During each visit areas of significant erosion or erosion control device failure shall be noted and appropriate remedial actions taken.

With the implementation of these measures, it is expected that the project would not result in substantial adverse impacts to creek habitat.

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

No migratory corridors or nursery sites are anticipated to be affected by the project. The project site does not contain spawning or rearing habitat for steelhead and critical habitat for fish passage. The bridge work would add material to the existing structures but would not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream. Riprap would be placed within the riparian woodland habitat to prevent further erosion of the banks at the storm drain outfall, and would not enter the creek bed. The stream channel and

banks would be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists. Restoration would use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. As such, the project would not change fish passage conditions. Bank Swallow (*Riparia riparia*) has the potential to pass through the project site during migration. The proposed project primarily involves short-term, temporary construction-related impacts and would not disrupt connectivity in the region. Therefore, potential impacts to wildlife corridors or nursery sites would be less than significant.

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

Less-than-Significant Impact

The Town of Fairfax Tree Protection Ordinance requires a permit for the removal or significant trimming of any tree, which has a circumference of 24 inches or more measured at 24 inches above the ground. No trees are proposed to be removed as part of the proposed project. Temporary direct impacts to Riparian Woodlands would result from tree trimming, if needed, for construction access. These areas would be revegetated following construction activities.

Consistency with the Tree Ordinance would ensure that the proposed project would not conflict with any local policies or ordinances protecting biological resources and impacts would be less than significant.

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

No state, regional, or federal habitat conservation plans or Natural Community Conservation Plans have been adopted for the project site. No impact would occur.

4.2.5 Cultural Resources

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☐	☐	☒
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c)	Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The proposed project is located in a residential neighborhood of the Town of Fairfax in Marin County. The archaeological APE was formulated by consultation between the Town of Fairfax and Caltrans District 4 Professionally Qualified Staff and includes all areas of direct impacts proposed for the project. The vertical APE varies over the project area but includes the excavation of trenches three feet in depth in the roadbed above the creek, and five feet below the bridge structure within the creek bed Group.

Far Western Anthropological Research Inc. (Far Western) was retained to prepare the following cultural resources services for the proposed bridge project: 1) Records Search; 2) Archeological Survey Report (ASR); and 3) Extended Phase I Report. JRP Historical Consulting (JRP) was retained to prepare the following cultural resources services for the proposed bridge project: 1) Historical Resources Evaluation Report (HRER); 2) Historical Property Survey Report (HPSR); and 3) Public Participation Consultation. A brief summary of the results of these services is provided below.

Records Search

Three resources have been previously recorded within the Records Search area, though none is within the APE. These are the multi-component Fairfax Pavilion Site (MRN-490/H); prehistoric human remains with associated prehistoric items (P-21-002661); and a prehistoric site (MRN-668) (Far Western 2023).

Archeological Survey Report

No resources were identified within the APE either in the archival records search or the pedestrian survey. However, three prehistoric sites are present within one-quarter mile, including one just 60 meters upstream (south) of the bridge and another just 300 meters to the south. Furthermore, both these deposits were not evident on the surface but were discovered during construction projects. In addition to the presence of two nearby deposits on San Anselmo Creek,

the western half of the APE is within areas of highest sensitivity for buried resources while the eastern half is of moderate sensitivity (Far Western 2023).

Given the presence of highest buried site sensitivity and buried cultural resources nearby, Caltrans requested that an Extended Phase I (XPI) study be conducted for the site (Far Western 2024). Far Western prepared an XPI proposal to conduct testing via hand-auguring within the APE. The proposed testing was designed to determine the presence or absence of archaeological deposits within the APE. A total of eight hand auger bores were excavated as part of this investigation. No cultural deposits, intact or otherwise, were encountered during this testing. Two pieces of debitage were observed within two of the augers, however there is no evidence they represent an archaeological deposit. These finds can be exempted under Attachment 4 of the Section 106 PA as "Isolated prehistoric finds consisting of fewer than three items per 100 square meters." Additionally, fragmentary modern refuse was minimally observed during testing and did not have any historic-era characteristics. No archaeological sites were encountered during testing.

Public Participation

JRP Historical Consulting, LLC, (JRP) identified potential local interested parties for this project and sent notification letters on May 7, 2015. Recipients of the letter were the Fairfax Historical Society and the Marin History Museum. JRP received no responses to the letters. JRP conducted follow-up e-mails on May 22, 2015. At that time it was revealed that the Marin History Museum was being dissolved, no further contact was possible. The Fairfax Historical Society referred JRP to the Town of Fairfax and recommended any alterations to the bridge reflect the historic design.

Historical Resources Evaluation Report

The residence at 30 Creek Road is the sole historic resource within the APE that required evaluation. The Creek Road Bridge over San Anselmo Creek was previously evaluated as part of the Caltrans Historic Bridge Inventory and found not eligible for the National Register of Historic Places (NRHP). The residence evaluated in this report does not appear to meet the criteria for listing in the NRHP or the California Register of Historic Resources (CRHR) because of a lack of historic significance (JRP 2025). The residence also has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlines in Section 5024.1 of the California Public Resources Code, and does not appear to be a historical resource for the purposes of CEQA.

Historical Property Survey Report

The 1979 Report on the Architectural and Historical Significance of the Bridges Found Within the Corte Madera Creek Flood Control project Study Area by Carroll W. Pusell Jr. evaluated 12 bridges through the Corte Madera Creek watershed but did not include Creek Road Bridge (27C-0144) as, at that time, it was not yet 50 years of age.

No built-environment resources were identified in the APE in the records search.
The APE includes the bridge—Creek Road Bridge (27C-0144). The bridge was previously determined to be ineligible for the National Register of Historic Places, and it is recorded as an ineligible bridge in the Caltrans Historic Highway Bridge Inventory.

Far Western conducted an archaeological survey of all visible ground surfaces in the creek bed, bank and around the bridge. No cultural materials were observed.

JRP Historical Consulting, LLC, (JRP) staff conducted a field survey of the APE and recorded the residence at 30 Creek Road, the bridge, and searched for remnants of the earlier wooden foot bridge that had been located in this vicinity. JRP staff did not identify any other buildings, structures, or objects in the APE that required recordation.

DISCUSSION OF IMPACTS

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

No Impact

No historic properties/cultural resources listed, determined, or potentially eligible for inclusion on the NRHP (36 CFR Part 800.4) and/or CRHR (California Public Resources Code *Section 5024.1*) were identified within or immediately adjacent to the proposed project's APE (JRP 2025). The bridge is not considered historic and has a value of 5 for Historical Significance (National Bridge Inventory, or NBI, Item No. 37), which identifies it as one of the most common historic bridge types. The bridge has been evaluated by Caltrans' Historic Bridge Inventory and was founds ineligible for listing on the NRHP and CRHR. Therefore, the project would not cause a substantial adverse change in the significance of a historical resource. No impact would occur.

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

Less-than-Significant Impact with Mitigation Incorporated

There are no known archeological resources within the APE; however, as the project includes excavation within the creek bed, there is a potential for the project to uncover such materials during construction. While fragmentary modern refuse was minimally observed during testing and did not have any historic-era characteristics and no archaeological sites were encountered during testing, the possibility of adversely affecting any accidentally unearthed resources during construction is considered a potentially significant impact but can be mitigated to a less than significant level via implementation of Mitigation Measure CUL-1.

Mitigation Measure CUL-1 – Unknown Archaeological Resources

If any archaeological deposits are encountered, the construction contractor shall immediately halt all soil-disturbing work within 25 feet of the discovery. A qualified archaeologist shall assess the significance of the find(s) and prepare a recommendation for further action. If the archaeological materials are determined to be significant, a qualified cultural resources professional shall develop an appropriate treatment plan in consultation with the Town. The plan could include avoidance and preservation measures to preserve the materials in place; scientific collection and analysis; preparation of a professional report in accordance with current professional standards; and professional museum curation of collected cultural materials and resource documentation. Soil-disturbing work within the area of the find shall not resume until a treatment plan has been approved by the Town of Fairfax.

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

Less-than-Significant Impact with Mitigation Incorporated

Human remains are not known to occur on the project site. However, the potential to uncover human remains is still present which is considered a potentially significant impact. Adherence to Mitigation Measure CUL-2 would reduce the possibility of disturbing accidentally discovered human remains to a less than significant level.

Mitigation Measure CUL-2 – Human Remains

In the event of post-review discoveries of human remains, the project shall implement the following procedures:

- The treatment of human remains and of associated or unassociated funerary objects discovered during any soil-disturbing activity within the project shall comply with applicable State laws. Pursuant to Section 7050.5 of the Health and Safety Code, and PRC Section 5097.94, in the event of the discovery of human remains during construction, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains. The Marin County Coroner shall be immediately notified and shall make a determination as to whether the remains are Native American.
- In the event of the coroner's determination that the human remains are Native American, notification of the NAHC, is required who shall appoint a Most Likely Descendant (MLD) (PRC Section 5097.98). The archaeological consultant, project sponsor, and MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of human remains and associated or unassociated funerary objects (CEQA Guidelines Section 15064.5(d)). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. California Public Resources Code allows 48 hours to reach agreement on these matters. If the MLD and the other parties do not agree on the reburial method, the project shall follow PRC Section 5097.98(b) which states that "the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American burials with appropriate dignity on the property in a location not subject to further subsurface disturbance."

4.2.6 Energy

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

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

Less-than-Significant Impact

Bridge retrofit would require the use of energy resources to power equipment and move workers and supplies to and from the site. Machinery idling would be limited per California law and equipment would be staged on and near the project site, minimizing the use of energy resources for equipment use and transportation. Following construction, energy use would be comparable to baseline levels. Operations of the bridge would not change, and capacity would not be expanded, so energy consumption by cars using the bridge would be more or less unchanged. As there would be a temporary, minimal increase in energy use during construction and energy use would return to baseline levels during operation, the project would result in less than significant impacts related to the wasteful, inefficient, and unnecessary consumption of energy resources.

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

No Impact

The Town of Fairfax's Climate Action Plan contains energy efficiency goals for the Town. Although it does not provide any mandatory policies for energy efficiency or renewable energy, it provides 18 recommended actions for businesses, residents, and government entities to improve energy efficiency and the use of renewables. Most of these recommended policies are tailored towards buildings and are not applicable to the proposed project.

Similarly, there are few requirements of state-wide plans and policies such as Title 24 that apply to seismic retrofit projects. As few local and state energy renewability and efficiency programs and policies apply to the project, there would be no conflict with any such programs and policies; and no impact would occur.

4.2.7 Geology and Soils

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
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?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the 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 project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐

ENVIRONMENTAL SETTING

On-Site Geologic Conditions

Soils

The soils that occur in the project site are Xerorthents-Urban land complex (0 to 9 percent slopes), which is on the western half of the site and Tocaloma-McMullin-Urban land complex (30 to 50 percent slopes), on the eastern half of the site (USDA NRCS 2015). The Tocaloma-McMullin-Urban land complex is a fine-loamy, mixed, mesic Typic Haploxeroll. Its drainage class is well drained. Soil taxonomy information is not available on the Xerorthents-Urban land complex.

Seismicity

The San Francisco Bay area is one of the most seismically active areas in the country. While seismologists cannot predict earthquake events, the U.S. Geological Survey's Working Group on California Earthquake Probabilities (2003) estimates there is a 62 percent chance of at least one magnitude 6.7 earthquake occurring in the Bay Area region between 2003 and 2032. As seen with damage in San Francisco and Oakland due to the 1989 Loma Prieta earthquake that was centered about 50 miles south, significant damage can occur at considerable distances. Higher levels of shaking and damage would be expected for earthquakes occurring at closer distances. The faults considered capable of generating significant earthquakes in the area are generally associated with the well-defined areas of crustal movement, which trend northwesterly. Faults considered active by the State of California and located closest to the site include: San Andreas (6.9 miles, west of the site), and Hayward (13.2 miles, east of the site). The project area is not located within a State-designated Alquist-Priolo Earthquake fault rupture zone (California Geological Survey [CGS] 2019).

Liquefaction and Lateral Spreading

Soil liquefaction is a condition where saturated granular soils near the ground surface undergo a substantial loss of strength during seismic events. Loose, water-saturated soils are transformed from a solid to a liquid state during ground shaking. Liquefaction can result in significant deformations and ground rupture or sand boils. Soils most susceptible to liquefaction are loose, uniformly graded, saturated, fine-grained sands that lie close to the ground surface. Lateral spreading is a type of ground failure related to liquefaction. It consists of the horizontal displacement of flat-lying alluvial material toward an open area, such as a steep bank of a stream channel. According to the Association of Bay Area Governments (ABAG), the project area is located in a moderate liquefaction hazard zones (ABAG 2020).

Landslide

The project area is illustrated as flatland by ABAG and is not located within a debris flow source area. Therefore, the project site would not be susceptible to earthquake-induced landslides or rainfall-induced landslides (ABAG 2020).

DISCUSSION OF IMPACTS

a-i) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

No Impact

The project site is not included in an earthquake fault zone designated by the Chief of the California Geological Survey pursuant to the Alquist-Priolo Act because there are no known faults in the project area. Because the project is not located near a known fault, the project will not expose people or structures to potential substantial adverse effects involving rupture of a known earthquake fault.

a-ii) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Strong seismic ground shaking?

Less-than-Significant Impact

The Creek Road Bridge was labeled a Category 1 Bridge, meaning it would fail catastrophically under the MCE, and could potentially result in the loss of life. The Creek Road Bridge is composed of a series of articulated simple spans sitting on top of concrete bent cap beams on 2-column concrete bents. This configuration is one of the vulnerabilities of the bridge. Since the superstructure spans are not connected to the substructure, they have the potential of unseating and collapsing during large seismic events. The purpose of the project is to seismically retrofit the bridge to prevent its catastrophic failure and the loss of life. The newly retrofitted bridge would be built according to the provisions of the California Building Code, which establishes structural seismic requirements. As the bridge would be more resilient to groundshaking following construction and the building code's seismic provisions would be complied this, impacts would be substantially mitigated by uniformly applicable development policies.

a-iii) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact

Liquefaction associated with ground shaking is possible given ABAG's hazard map. However, the construction phase of the proposed project is temporary and operation of the proposed project would be similar to existing conditions. In addition, design of project components would adhere to California Building Code requirements specific to the area to minimize the potential for damage from earthquake activity in the future. Impacts associated with liquefaction would be less than significant.

a-iv) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: Landslides?

Less-than-Significant Impact

The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Gravity acting on an over-steepened slope is the primary reason for a landslide. Slope material that becomes saturated with water may develop a debris flow or mud flow. The resulting slurry of rock and mud may pick up trees, houses, and cars, thus blocking bridges and tributaries causing flooding along its path. Any area composed of very weak or fractured materials resting on a steep slope can and will likely experience landslides. Although the physical cause of many landslides cannot be removed, geologic investigations, good engineering practices, and effective enforcement of land-use management regulations can reduce landslide hazards. The potential for landslides or liquefaction from seismic activity is

considered low in the project site based on the geologic units and relatively flat topography. The project site is not located in an Association of Bay Area Government (ABAG) designated earthquake-induced landslide area or within an existing rainfall-induced landslide or debris flow area. Therefore, seismic-related ground failure is not anticipated at the project site and the site is not located in an area that would be subject to landslides or mudslides. Therefore, this is a less-than-significant impact.

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

Less-than-Significant Impact with Mitigation Incorporated

The project proposes to excavate sediments around bridge supports (Bents 2-4) included excavating a trench for full shoring, embedded riprap, and layers of bottom rock. Soils excavated from this work would be stored above the project site and used later for backfill of the trenches. Mitigation Measure BIO-4 in *Section 4.2.4, Biological Resources*, addresses erosion and siltation impacts to the Perennial Stream ("Other Waters" and Wetlands) by listing avoidance and minimization measures. These measures include BMPs such as silt fencing, jute mesh, straw wattles, compliance with the RWQCB's Erosion and Sediment Control Field Manual, and post construction erosion monitoring. Implementation of Mitigation Measure BIO-4 and HYDRO-1 in *Section 4.2.10, Hydrology and Water Quality,* would reduce potentially significant impacts related to soil erosion to a less-than-significant level.

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

Less-than-Significant Impact

The predominant geologic units underlying the Town of Fairfax are bedrock and alluvium. These deposits are typically those that are the most susceptible to seismic shaking, liquefaction, and differential settlement. Although these geologic units are typically susceptible to such hazards, according the ABAG Resilience Program Hazard Map the potential for liquefaction at the project site is moderate. The purpose of the proposed project is a seismic retrofit of the existing bridge structure in order to address vulnerabilities and prevent failure resulting in collapse or loss of life during the Maximum Credible Earthquake. The project site is located on flatland and would therefore have no potential for landslides.

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

No Impact

The potential for geologic and soil hazards from unstable or expansive soils in the project site is considered negligible based on data from the County of Marin: Marin Map Data Viewer. Thus, there would be no direct or indirect risks to life or property due to expansive soil and no impact would occur.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact

The project does not involve construction of septic tanks or wastewater disposal systems. No impact would occur.

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

Less-than-Significant Impact with Mitigation Incorporated

While no paleontological resources were discovered during the pedestrian and XPI surveys, three prehistoric sites are present within one-quarter miles of the proposed project site. As the potential for discovery of paleontological resources is still present the following mitigation measure would reduce impacts to a less than significant level.

Mitigation Measure GEO-1:

In the event of post-review discoveries of paleontological resources the following recommendations apply:

- If any paleontological deposits or unique geological resources are encountered, all soil-disturbing work shall be halted at the location of any discovery until a qualified paleontologist or geologist evaluates the significance of the find(s) and prepares a recommendation for further action. If the materials are determined to be significant, a qualified professional shall develop an appropriate treatment plan in consultation with the Town and the Environmental Protection Agency (EPA) to mitigate the discovery. The plan could include avoidance and preservation measures to preserve the materials in place; scientific collection and analysis; preparation of a professional report in accordance with current professional standards; and, professional museum curation of collected materials and resource documentation.

4.2.8 Greenhouse Gas Emissions

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b)	Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of greenhouse gases (GHGs) that contribute to global warming or global climate change have a broader, global impact. Global warming is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth's atmosphere. The principal GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space. Among the potential implications of global warming are rising sea levels, and adverse impacts to water supply, water quality, agriculture, forestry, and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air pollutants, much of the GHG production comes from motor vehicles. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning on the city, county, and subregional level, and other measures to reduce automobile use.

In 2010, BAAD adopted quantitative thresholds of significance for construction activities, but only identified GHG thresholds of significance for operational emissions; the Town identified no GHG thresholds for construction-related activities.

DISCUSSION OF IMPACTS

Unlike emissions of criteria and toxic air pollutants, which have local or regional impacts, emissions of greenhouse gases (GHGs) that contribute to global warming or global climate change have a broader, global impact. Global warming is a process whereby GHGs accumulating in the atmosphere contribute to an increase in the temperature of the earth's atmosphere. The principal GHGs contributing to global warming are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds. These gases allow visible and ultraviolet light from the sun to pass through the atmosphere, but they prevent heat from escaping back out into space. Among the potential implications of global warming are rising sea levels, and adverse impacts to water supply, water quality, agriculture, forestry, and habitats. In addition, global warming may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health. Like most criteria and toxic air pollutants, much of

the GHG production comes from motor vehicles. GHG emissions can be reduced to some degree by improved coordination of land use and transportation planning on the city, county, and subregional level, and other measures to reduce automobile use.

In 2010, BAAD adopted quantitative thresholds of significance for construction activities, but only identified GHG thresholds of significance for operational emissions; the Town identified no GHG thresholds for construction-related activities.

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

Less-than-Significant Impact

The BAAD has adopted thresholds of significance that were designed to establish the level at which GHG emissions would cause significant environmental impacts under CEQA. The thresholds are included in the 2022 CEQA Air Quality Guidelines (BAAD 2022).

The project would produce GHG emissions from temporary construction-related activities, including operation of heavy equipment, use of trucks, and worker trips to and from the project sites. The proposed project would not result in an increase in generation of GHG emissions after construction is complete. GHG emissions from project operation would be limited to vehicular trips and equipment emissions during occasional maintenance activities, which would be similar to or less than pre-project conditions.

The BAAD does not have an adopted threshold of significance for construction GHG emissions. The BAAD's approach to developing thresholds of significance for GHG impacts is to use a "fair share" approach to determine whether an individual project's GHG emissions would be cumulatively considerable. If a project would contribute its "fair share" of what is needed to achieve statewide long-term GHG reduction goals, the impact of the project's GHG emission would be less than significant. The BAAD has identified required design elements that land use projects must incorporate into project plans in order for the operational impact of their project to be considered less than significant. There are no design elements required for transportation infrastructure projects, and therefore the project must only be consistent with the local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b) (BAAD 2022).

The Fairfax Climate Action Plan 2030 is the relevant GHG reduction strategy which sets goals for the Town of Fairfax to achieve carbon neutrality by 2030 (Town of Fairfax 2021). The plan contains a variety of regulatory, incentive-based and voluntary strategies that are expected to reduce emissions from both existing and new development in the Town. The key strategies revolve around transportation, renewable energy and electrification, energy efficiency, waste reduction, and water conservation. The plan does not contain policies that apply to construction projects and does not set specific GHG emissions thresholds for construction projects. Therefore, the project would not conflict with the Climate Action Plan. The impact would be less than significant.

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

No Impact

As described above in Impact a), the applicable local plan adopted for the purpose of reducing GHG emissions is the Town's Climate Action Plan. The project would generate GHG emissions during project construction; however, the plan contains no policies related to GHG emissions from construction equipment or activities. The project would not create any new permanent source of GHG emissions or cause an increase in existing GHG emissions because the project would not expand roadway capacity. Therefore, the project would not conflict with any goals identified in the Town's Climate Action Plan. No impact would occur.

4.2.9 Hazards and Hazardous Materials

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
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?	☐	☒	☐	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed 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?	☐	☐	☐	☒
e)	For a project located within 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 project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
g)	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☒	☐	☐

ENVIRONMENTAL SETTING

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency or if it has characteristics defined as hazardous by such an agency. A hazardous material is defined in Title 22 of the California Code of Regulations as follows:

A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed. (California Code of Regulations, Title 22, Section 66261.10)

Chemical and physical properties cause a substance to be considered hazardous. Such properties include toxicity, ignitability, corrosivity, and reactivity (as defined in California Code of Regulations, Title 22, Sections 66261.20-66261.24). The release of hazardous materials into the environment could potentially contaminate soils, surface water, and groundwater supplies. Under Government Code Section 65962.5, the California Department of Toxic Substances Control (DTSC) maintains a list of hazardous substance sites. This list, referred to as the "Cortese List," includes CALSITE hazardous material sites, sites with leaking underground storage tanks, and landfills with evidence of groundwater contamination.

DISCUSSION OF IMPACTS

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 with Mitigation Incorporated

Small amounts of hazardous materials would be used during construction activities for equipment maintenance (e.g., fuel and solvents). Use of hazardous materials would be limited to the construction phase and would comply with applicable local, state, and federal standards associated with the handling and storage of hazardous materials. Hazardous materials would not be stored or used, such as for equipment maintenance, where they could affect nearby residences. Standard construction measures would be implemented to contain any accidental spills of oil and other hazardous materials, and the contractor would be required to ensure that adequate materials are on hand to clean up any accidental spill that may occur. Spills would be cleaned up immediately, and all wastes and used spill control materials would be properly disposed of at approved disposal facilities. With implementation of these standard measures and Mitigation Measures HYDRO-1 and HYDRO-2 in *Section 4.2.10, Hydrology and Water Quality*, impacts associated with the use or accidental spill of hazardous materials would be less than significant.

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 with Mitigation Incorporated

The repairs to the existing bridge would include the use of hazardous materials during the construction phase of the project such as fuels for construction vehicles. The handling and storage of these materials would be subject to all applicable local, state, and federal regulations. No upset or accident conditions can be reasonably expected to occur under these circumstances. Implementation of Mitigation Measure BIO-4 includes minimization measures for impacts to Perennial Streams ("Other Waters" and Wetlands) that includes the preparation of an Accidental Spill Prevention and Cleanup Plan. As the proposed project would restore the bridge to its existing functions, the operation of the bridge would not result in the generation or use of

hazardous materials. Therefore, potential impacts from accident conditions would be less than significant.

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

Existing or proposed schools are not located within ¼ mile of the proposed project site. The nearest school, Sir Francis Drake High School, is located approximately one mile east of the project site. Additionally, operation and maintenance of the project would not emit hazardous emissions or utilize hazardous substances. Therefore, the project would have no impact with respect to emitting hazardous emissions or handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed 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?

No Impact

The proposed project site is not included on the list of hazardous materials sites complied pursuant to Government Code Section 65962.5 (DTSC 2025). No impact would occur.

e) For a project located within 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 project result in a safety hazard for people residing or working in the project area?

No Impact

The proposed project is not located within an airport land use plan, nor is it within two miles of a public airport or public use airport. Therefore, the project would have no impact regarding a safety hazard for people residing or working in the project area.

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

Less-than-Significant Impact with Mitigation Incorporated

During construction the Creek Road Bridge would be closed and detours would be established to and away from the bridge via Creek Road and Porteous Avenue in the direction away from the bridge towards Bolinas Road. Mitigation Measure TRANS-1 in *Section 4.2.17, Transportation*, would address lane closures and traffic control during construction and mitigate impacts to emergency access to less-than-significant levels. Thus, impacts would be less than significant with mitigation incorporated.

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

As further described in *Section 4.2.20, Wildfire,* the project site is in a High Fire Hazard Severity Zone in the local responsibility area for wildfire protection. Fire protection services in the area are provided by the Ross Valley Fire Department, with the nearest station located one mile from the project site. During construction, the use of construction equipment at the site could slightly increase the risk of unwanted combustion; however, compliance with standard construction site best management practices would ensure that any such combustion is immediately extinguished. In addition, the Ross Valley Fire Department is located one mile from the site, and would be contacted if any accidental combustion of vegetation or materials occurs. The long-term operation of the project would not increase the risk of wildfire because no new permanent sources of combustion would be created by the project. The risk of wildfire during project operation would remain similar to the existing conditions. Therefore, the project would not expose people or structures to significant risk of loss, injury, or death involving wildland fires. The impact would be less than significant.

4.2.10 Hydrology and Water Quality

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
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;	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☐	☒
iii) create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☒	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The 28-square mile Corte Madera watershed extends from Mt. Tamalpais and White's Hill through the communities of Fairfax, Sleepy Hollow, San Anselmo, Ross, Kentfield, Greenbrae, Larkspur, and Corte Madera to San Francisco Bay. The watershed includes 44 miles of stream channels. Ross Creek drains the northern slope of Mt. Tamalpais; San Anselmo Creek and its tributaries drain the northwestern portion of the watershed. The two channels join to form Corte

Madera Creek, which continues through more than a mile of concrete-lined channel past the confluences of Larkspur and Tamalpais Creeks and into the salt marsh at the mouth.

Protection of water quality in California is primarily the responsibility of the State Water Quality Control Board (SWQCB), and, on a regional basis, the nine California Regional Water Quality Control Boards. Water quality within the project sites is primarily under the jurisdiction of the RWQCB, San Francisco Bay Region (Region 2). The Town of Fairfax is responsible for overseeing the requirements of its water quality codes and ordinances.

The principal natural hydrological sources for the project site are creek flows, direct precipitation and surface run-off from adjacent lands. San Anselmo Creek flows though the project site towards the north/northeast. Just north of the project site, Deer Creek joins San Anselmo Creek. Roughly one quarter of a mile to the north, it joins Fairfax Creek and turns east, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. In wet years, the creek at this location is perennial. At the time of the fieldwork, in a drought year, the flows were low.

According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Maps (FIRM), the project site is located in flood zone AO. Zone AO is defined as an area within the 100-year flood zone where the average flood depth is one to three feet.

According to ABAG's Resilience Program Hazard Maps, the project site is not subject to seiches and is not within a Tsunami Inundation Area.

DISCUSSION OF IMPACTS

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

Less-than-Significant Impact with Mitigation Incorporated

The proposed project would require the use of hazardous materials such as vehicle fuels during the construction phase of the project. The proposed project would be required to obtain a Section 404 nationwide permit from the U.S. Army Corps of Engineers, a Section 1602 permit from CDFW, and a Section 401 Certification from the RWQCB. Mandatory compliance with all measures listed in each permit would be required for project approval. Construction activities would be required to comply with the NPDES general permit for construction activities, pursuant to which BMPs would be implemented to control stormwater during construction. As part of the permit application process, projects would require a stormwater pollution prevention plan (SWPPP), which would include a list of BMPs to be implemented on the site both during and after construction to minimize erosion and sedimentation.

The primary risk to water quality and resources would result from construction-related sediment and other pollutants entering the during a rain event. Implementation of Mitigation Measures HYDRO-1 and HYDRO-2 would reduce potential impacts related to erosion and siltation to less-than-significant levels.

Mitigation Measure HYDRO-1: NPDES Permit

The contractor shall prepare a SWPPP in accordance with the NPDES General Construction Permit, pursuant to the CWA. Best Management Practices shall be identified in the SWPPP to reduce or eliminate pollutants from the construction site entering storm water discharges. Implementation of BMPs shall control erosion and to ensure that dirt, construction materials, pollutants, or other human-associated materials are not discharged from the project area into surface waters or into areas that would eventually drain to storm drain systems. BMPs required by the SWPPP may include but are not limited to silt fencing, erosion control blankets, and street sweeping.

Mitigation Measure HYDRO–2: Water Quality Standards

The Town of Fairfax shall require the construction contractor to submit an equipment staging plan and proposed staging locations no later than 30 days prior to the start of construction. The specifications shall include at minimum, the following requirements:

- The staging area shall be located on an existing asphalt or concrete surface area. No staging shall be permitted on undeveloped lots. The Contractor shall notify the Town whether or not a suitable area is available.
- The staging area shall be included in the Contractor's Water Quality Protection Plan.
- The staging area shall not be located in an environmentally or culturally sensitive area and /or impact water resources (rivers, streams, bays, inlet, lakes, drainage sloughs).
- The staging area shall not be located in a regulatory floodway within the base floodplain (100-year).
- The staging area shall be inspected weekly by the project environmental monitor to ensure compliance with the Water Quality Protection Plan, and any violations will result in immediate suspension of the work until rectified.

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

No Impact

The project would not require use of groundwater supplies or affect groundwater recharge in the area. As such, the project would not impede sustainable groundwater management of the basin and no impact would occur.

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;

Less-than-Significant Impact with Mitigation Incorporated

The proposed repairs to the Creek Road Bridge include excavation within the creek bed, which has the potential to result in temporary erosion and siltation impacts. Implementation of

Mitigation Measures BIO-4, HYDRO-1, and HYDRO-2 would assure the use of BMPs related to erosion and siltation. Once construction is finished, vegetation disturbed by or removed for construction would be replaced so that substantial erosion or siltation would not occur. Once vegetation is established, the conditions related to erosion would be similar to existing conditions. Impacts would therefore be less than significant with mitigation incorporated.

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

The proposed project would not create or contribute additional runoff compared to existing conditions. The project would retrofit the existing bridge and would not add additional impervious surfaces that would contribute to runoff. Runoff from the project site would be similar to existing conditions and no additional capacity would be needed for the stormwater drainage systems. Since the proposed project would not contribute substantial runoff, impacts would be less than significant.

iii) create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff; or

Less-than-Significant Impact

The proposed project would not substantially alter the existing drainage pattern of the area. The bridge has a more than adequate waterway opening for the design floods and would not increase the width of the deck thereby increasing the amount of impervious cover present at the project site. The construction work may reduce the current bridge opening slightly but would not result in measurable water surface elevation rise up- or downstream of the bridge. A perennial creek flow is generally present during wet years but The proposed project would not contribute substantial erosion or siltation or increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site. The abandonment of the existing 12" storm water drainage pipe and the establishment and redirection of a new 12" storm water drainage pipe would ensure that the drainage capacity would remain the same as existing conditions. Since the proposed project would not contribute substantial runoff, this pipeline replacement would adequately serve the needs of the project site and impacts would be less than significant.

iv) impede or redirect flood flows?

Less-than-Significant Impact

The project site is susceptible to occasional flooding. This bridge has a more than adequate waterway opening for the design floods. The required construction work may reduce the current bridge opening slightly but would not result in measurable water surface elevation increases either upstream or downstream of the bridge. The retrofitted bridge has been designed to provide adequate clearance during flooding events. Hydrological modeling prepared in support of the design process determined that there would be no appreciable change in upstream or downstream flooding due to the project. The project would not change any flood flows and flooding conditions during and after project implementation would be similar to existing conditions. Thus, the project would not impede or redirect flood flows, and impacts would be less than significant.

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

Less-than-Significant Impact with Mitigation Incorporated

Seiche and tsunami occur near large open water bodies such as lakes and oceans. Since the project site is not located near such a water body and is sufficiently upstream from the ocean and the nearest lakes, it is not susceptible to seiche or tsunami.

Flooding is possible within the project site, and should flooding occur, pollutant release due to project inundation is possible. As described in *Section 3.0, Project Description*, a dewatering plan that protects aquatic resources would be required of the Contractor and reviewed and implemented. Where needed, the flow would be diverted around the work area by building a cofferdam upstream of the location and bypassing flowing water through a diversion pipe, keeping turbidity to a minimum. BMPs would be implemented to avoid the migration of the sediments or contaminants into the water flow areas or drainage systems. This would ensure that perennial flows would be diverted outside of the work area and would not be impacted by sediment or pollutants generated by project construction activities. In addition, Mitigation Measure HYDRO-2 would be implemented, which would ensure that stormwater runoff from the project site would not carry excessive pollutants and sediments into nearby waterways. With implementation of Mitigation Measure HYDRO-2, which requires preparation of a construction staging plan, this possibility would be negligible, and impacts would be reduced to less than significant levels. Impacts would therefore be less than significant with mitigation incorporated.

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

Less-than-Significant Impact with Mitigation Incorporated

The operational project would not obstruct a water quality control plan or sustainable groundwater management plan, as bridge operations would be unchanged. During construction, equipment would be used that could impair water quality should fuels and lubricants enter waterways during flooding or spill events. This possibility is reduced to a less than significant level with implementation of Mitigation Measures BIO-4 and HYDRO-2. The project would be required to comply with BMPs contained in regulatory permits which would ensure that project work would not change the overall water quality of nearby water bodies in the long-term. Thus, impacts to water quality control plans and sustainable groundwater management plans would be less than significant with mitigation incorporated.

4.2.11 Land Use and Planning

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a) Physically divide an established community?	☐	☐	☐	☒
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?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The Town of Fairfax General Plan provides policies and implementation strategies for management of the resources and land uses in the Town, and the Town Codes provide restrictions and requirements to protect resources and comply with local, state, and federal laws. No habitat conservation plans have been adopted for the area.

Town of Fairfax General Plan

The proposed project is subject to the following General Plan policies:

Land Use Element

Policy LU-4.1.2: New and renewed development shall comply with all federal, state, and local regulations pertaining to development in flood zones.

Policy LU-4.1.3: New and renewed development shall comply with all regulations encompassed in the California and Uniform Building Codes intended to reduce potential damage and threats to the public's health, safety, and welfare in the event of an earthquake.

Policy LU-7.2.2: To the extent feasible natural features including the existing grade, mature trees, and vegetation shall be preserved for new and renewed development.

Circulation Element

Policy C-2.2: Maintain the street, sidewalk and pathway network through a regular maintenance program.

Conservation Element

Policy Con-2.1.2: All planning decisions shall require application of existing air quality guidelines and best practices to minimize air quality impact.

Policy Con-2.1.3: Improve air quality by encouraging green building techniques for all new and remodel construction within the Town of Fairfax.

Policy Con-3.1.1: Maintain floodwater capacity and promote creek restoration.
Policy Con-3.1.2: The Town of Fairfax shall protect and restore riparian habitat and ensure natural channel process in the San Anselmo Creek and Fairfax Creek watersheds.

Policy Con-5.2.1: Maintain and restore native vegetation where appropriate for habitat value, aesthetics, reference habitat, and riparian cover.

Policy Con-6.1.2: Protect special-status species and resident and migrant wildlife, and their habitats, within the Fairfax Planning Area (also see Goal CON-3 and Policy CON-5.2.1).

Policy Con-8.2.1: Protect, maintain, rehabilitate, and enhance historical and cultural resources within the Fairfax Planning Area.

Policy Con-8.2.3: Ensure that development respects and complements the patterns, character, and scale of the Town's traditional communities and natural landscape.

Health and Safety

Policy S-1.1.3: The Town shall identify, evaluate, and encourage the seismic retrofit of public and private buildings that pose a risk of death or injury in a geohazard event.

Policy S-3.1.3: Maximize access and egress for emergency response vehicles. Also see Conservation Element, Goal C-4.

Noise Element

Policy N-1.1.1: All new development must include an analysis of potential noise impacts.

Safety Element

Policy S-1.1.2: Geotechnical data will be easily available to the public and interested parties.

Policy S-1.1.3: The Town shall identify, evaluate, and encourage the seismic retrofit of public and private buildings that pose a risk of death or injury in a geohazard event.

DISCUSSION OF IMPACTS

a) Physically divide an established community?

No Impact

The proposed project involves the seismic retrofit of an existing bridge within the Town of Fairfax. Upon completion of construction the project site would remain the same as existing conditions. Therefore, the proposed project would not divide a community and no impact would occur.

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?

Less-than-Significant Impact

The proposed project is subject to several local policies, plans, and regulations, such as the Town of Fairfax's General Plan and Zoning Ordinance. The proposed project is seismic retrofit of existing bridge that would improve safety and reduce the potential for hazards, as specifically called for in the Safety Element of the Town's General Plan. The project would comply with applicable policies and ordinances of the Town of Corte Madera governing construction, noise, lighting, solid waste, and other relevant areas. Therefore, these actions would not conflict with the Town of Fairfax General Plan or other plans or policies adopted for the purpose of avoiding or mitigating an environmental effect, and less than significant impacts would occur.

4.2.12 Mineral Resources

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The CDOC has mapped three mines within Marin County including the Nicasio Rock Quarry in Nicasio, the Redwood/Silveira Quarry north of Novato, and Dutra Minerals in San Rafael (CDOC 2016). The proposed project is located within an urbanized area of the Town of Fairfax and is not located near any of these mines. There are no known mineral resources within the vicinity of the project site.

DISCUSSION OF IMPACTS

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

The project site is not located within the vicinity of either of the three mines within Marin County and no other known mineral resources areas are near the project site. Furthermore, the development of the proposed project would not preclude future excavation of oil or minerals should such resources be found. Therefore, the project would not result in the loss of availability of a mineral resource that would be of value to the region and the residents of the state.

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

The project site is not in or adjacent to any important mineral resource areas. There are no known mineral resources on the project sites as delineated in the Town of Fairfax General Plan 2010-2030. Therefore, the proposed project would have no impact.

4.2.13 Noise

Would the project result in:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
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 project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Illingworth and Rodkin (I&R) were retained to conduct a Construction Noise and Vibration Assessment for the Creek Road Bridge (I&R 2015, Appendix C).

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales, which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities.

There are several methods of characterizing sound. The most common in California is the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which

the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 3. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The Day/Night Average Sound Level (Ldn) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 4 displays the reactions of people and the effects on buildings that continuous vibration levels produce.

The annoyance levels shown in Table 4 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different

vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

Table 3. Typical Noise Levels in the Environment

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (DBA)	COMMON INDOOR ACTIVITIES
	110	Rock band
Jet fly-over at 1,000 feet		
	100	
Gas lawn mower at 3 feet		
	90	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	**70**	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	**60**	
		Large business office
Quiet urban daytime	**50**	Dishwasher in next room
Quiet urban nighttime	**40**	Theater, large conference room
Quiet suburban nighttime		
	30	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

Source: Technical Noise Supplement (TeNS), Caltrans, September 2013.

Table 4. Reactions of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

VELOCITY, PPV (IN/SEC)	HUMAN REACTION	EFFECT ON BUILDINGS
0.01	Barely perceptible	No effect
0.01	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, Caltrans, September 2013.

Existing Noise Environment

The existing Creek Road Bridge is located within a residential development with several single-family residences located in the vicinity of the proposed project site, as shown in. Each of these noise-sensitive land uses have the potential to be adversely affected by noise and vibration attributable to project construction activities. The main sources of noise at the project site include vehicular traffic along local roadways and the occasional planes that may fly overhead. No airports are located in the vicinity; thus, this noise source is intermittent. Noise measurements were not taken at the project site. However, a noise contour plot in the Town's General Plan shows that the existing noise environment in the vicinity of the project site would typically be characterized by ambient noise levels less than 60 dBA Ldn.

REGULATORY BACKGROUND

The proposed project would be subject to noise-related regulations, plans, and policies established within documents prepared by the Town of Fairfax. Applicable planning documents include the Town's General Plan and Municipal Code.

Town of Fairfax General Plan

The Town of Fairfax's General Plan Noise Element establishes goals, policies, and programs for noise and vibration sources. Applicable goals, policies, and implementation measures presented in the General Plan are as follows:

Goal N-3: Maintain the current quality of the acoustical environment.

Objective N-3.1: Establish a noise abatement program that preserves the existing acoustical character of the Town.

- **Policy N-3.1.4:** Implement appropriate standard controls (e.g., some or all of Standard Controls a-h above) for all construction projects.
- **Program N-3.1.4.1:** Develop a guidance manual to provide information to public regarding construction noise control.
- **Policy N-3.1.5:** Consider CEQA review for construction projects lasting more than 18 months, and submittal of detailed construction noise management plans.
- **Program N-3.1.5.1:** Develop a guidance manual to provide information to public regarding construction noise control.

Town of Fairfax Municipal Code

The Town's Municipal Code provides provisions for noise control in Chapter 8.20. The portions of the Municipal Code that are relevant for this project are as follows:

Chapter 8.20.010 Policy Declaration; Nuisance Declared.

A. In order to control unnecessary, excessive and annoying noise in the town, it is declared to be the policy of the town to prohibit the noise generated from or by all sources as specified in this chapter. It is the policy of the town to maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the town where noise levels are above acceptable values.

B. It is determined that certain noise levels are detrimental to the public health, welfare and safety, and are contrary to public interest. Therefore, the town does ordain and declare that creating, maintaining, causing or allowing to be created, caused or maintained, any noise in a manner prohibited by or not in conformity with the provisions of this chapter, is a public nuisance. (Prior Code, § 8.16.010) (Ord. 481, passed - -1981)

Chapter 8.20.030 Compliance by Town Departments.

A. All departments of the town shall carry out their activities in accordance with the provisions of this chapter.

B. Each department whose duty it is to review and approve new projects, or changes to existing projects, which result or may result in the emission of noise shall make the finding that the project complies with the provisions of this chapter prior to project approval. (Prior Code, § 8.16.030) (Ord. 481, passed - -1981)

Chapter 8.20.050 Exterior Noise Limits.

A. Maximum permissible sound levels by receiving land use.

1) The noise standards for the various noise zones as presented in the following table shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

2) No person shall operate or cause to be operated any source of sound at any location within the incorporated town, or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by the person, which causes the noise level when measured at the complainant's property line to

exceed the limits in the table below for more than seven and one-half minutes in a 15- minute period. Those seven and one-half minutes need not be continuous.

3) If the measured ambient level differs from that permissible, the allowable noise exposure standard shall be adjusted in five-decibel increments in each category as appropriate to encompass or reflect the ambient noise level.

4) If the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone shall apply.

B. Correction for character of sound.

1) In the event the alleged offensive noise, as judged by the Chief of Police or his or her designated representative, contains a steady, audible tone such as a whine, screech or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech, the standard limits set forth in Table 5 shall be reduced by five decibels.

2) These zones are illustrated on Exhibit A, "Noise Zones, Town of Fairfax," attached to the ordinance codified in this chapter. Areas that are not covered on the map are included in Zone A. (Prior Code, § 8.16.050) (Ord. 481, passed - - 1981; Am. Ord. 529, passed - -1984)

Table 5. Exterior Noise Limits

(LEVELS ARE NOT BE EXCEEDED MORE THAN 7.5 MINUTES IN ANY 15-MINUTE PERIOD)			
NOISE ZONE		**TIME PERIOD**	**NOISE LEVEL (DBA)**
A (Residential)	Night	10:00 p.m. - 7:00 a.m.	40
	Day	7:00 a.m. - 10:00 p.m.	50
B (Multiple Dwelling, Residential)	Night	10:00 p.m. - 7:00 a.m.	50
	Day	7:00 a.m. - 10:00 p.m.	55
C (Commercial)	Night	10:00 p.m. - 7:00 a.m.	55
	Day	7:00 a.m. - 10:00 p.m.	60

Chapter 8.20.060 Prohibited Acts.

C. Construction/demolition domestic power tools.

1) The operation of any tools or equipment used in construction or demolition work between weekday hours of 8:00 p.m. and 8:00 a.m. or on weekends or holidays between the hours of 8:00 p.m. and 9:00 a.m., such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, is prohibited.

2) Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool or similar tool between 8:00 p.m. and 8:00 a.m.

or on weekends or holidays between the hours of 8:00 p.m. and 9:00 a.m., so as to create a noise disturbance across a residential or commercial real property line, is prohibited.

D. Machinery. Any motor, machinery or pump, such as swimming pool equipment and the like, shall be sufficiently enclosed or muffled and maintained so as not to create a noise or disturbance.

Chapter 8.20.070 Exemptions.

D. The operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work, mechanically powered saw, sander, drill, grinder, lawn or garden tool, leaf blower, or similar tool between 8:00 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. and 8:00 p.m. on weekends are exempt. (Prior Code, § 8.16.070) (Ord. 481, passed - - 1981; Am. Ord. 731, passed 2-6-2008)

DISCUSSION OF IMPACTS

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

Less-than-Significant Impact with Mitigation Incorporated

No permanent noise increase would result from the project. The bridge would be retrofit for enhanced safety and operations would continue as is, with a similar level of activity and use to the present. During construction, however, a temporary increase in ambient noise is anticipated.

Noise generated by project-related construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction noise levels would vary on a day-to-day basis during each phase of construction, depending on the specific task being completed. Each construction phase would require a different combination of construction equipment necessary to complete the task and differing usage factors for such equipment. Construction noise would primarily result from the operation of heavy construction equipment and the arrival and departure of heavy-duty trucks.

The Town's General Plan shows that the existing noise environment in the vicinity of the project site would typically be characterized by ambient noise levels less than 60 dBA Ldn. Activities associated with the earthwork and retrofit phases of the project would generate hourly average noise levels up to 85 dBA Leq at a distance of 50 feet. Maximum instantaneous noise levels would reach 85 dBA Lmax at 50 feet. This retrofit project does not include pile driving activities, which are considered generally to be one of the most excessive noise-generating construction activities. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor; therefore, the noise levels calculated at 50 feet would be about 6 dBA less at 100 feet and 12 dBA less at 205 feet. Shielding provided by buildings or terrain would result in even lower construction noise levels at distant receptors.

Construction-related vehicles traveling to and from the project site would generate worst-hour noise levels of approximately 57 dBA Leq at a distance of 50 feet from the center of Creek Road, assuming that the peak number of trucks expected on any one day would be approximately eight one-way truck trips per hour and that up to 20 one-way vehicle trips would occur per hour for the construction crew.

Although the construction of the proposed project would elevate noise levels at nearby noise-sensitive land uses by 25 dBA or more above ambient daytime conditions, Mitigation Measure NOISE-1 would require implementation of best management practices as suggested in the Town's General Plan to reduce noise from construction activities at nearby sensitive land uses. As stated in § 8.20.079 of the Town of Fairfax Municipal Code, "the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work, mechanically powered saw, sander, drill, grinder, lawn or garden tool, leaf blower, or similar tool between 8:00 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. and 8:00 p.m. on weekends are exempt (from the provisions contained in § 8.20.050)." Therefore, temporary noise generated during construction would not generate noise levels that are in excess of local standards or established in the local noise ordinance. Noise impacts would be minimized to the degree feasible with the implementation of Mitigation Measure NOISE-1, and no permanent noise impact would result from the project.

Mitigation Measure NOISE-1: Construction Noise

In order to comply with Policy N-3.1.4, the Town of Fairfax has developed a list of Standard Controls. The project shall comply with the following measures:

1. Limit construction to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or Holidays.
2. Control Noise from construction workers' radios to the point where they are not audible at existing residences that border the project site.
3. Equip all internal combustion engine-driven equipment with mufflers which are in good condition and appropriate for the equipment.
4. Utilize quite models of air compressors and other stationary noise sources where technology exists.
5. Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.
6. Prohibit unnecessary idling of internal combustion engines.
7. Notify residents adjacent to the project site of the construction schedule in writing.
8. Designate a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., starting too early, bad mufflers) and institute reasonable measure warranted to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.

In addition, the project shall follow the standard construction noise requirements regulated by Caltrans Sections 7-1.01I and 14-8.02 of the Standard Specifications which states the following:

1. Do not exceed 86 dBA at 50 feet from the job site activities from 9 p.m. to 6 a.m.
2. Equip an internal combustion engine with the manufacturer-recommended muffler. Do not operate an internal combustion engine on the job site without the appropriate muffler.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less-than-Significant Impact

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include site preparation work, dewatering, excavation, retrofit reinforcement, and paving. The proposed project would not require pile driving, which can cause excessive vibration.

For structural damage, Caltrans recommends a vibration limit of 0.5 in/sec Peak Particle Velocity (PPV) for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened. All buildings in the project vicinity are assumed to be structurally sound, but these buildings may or may not have been designed to modern engineering standards. No ancient buildings or buildings that are documented to be structurally weakened are known to exist in the area. Therefore, ground-borne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact.

Table 6 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. The single-family residences in the immediate project vicinity range from 50 to 205 feet; at these distances, vibration levels would be expected to be 0.1 in/sec PPV or less, below the 0.3 in/sec PPV significance threshold. This would be a less-than-significant impact and would not require mitigation.

Table 6. Vibration Source Levels for Construction Equipment

EQUIPMENT		PPV AT 25 FT. (IN/SEC)	APPROXIMATE LV AT 25 FT. (VDB)
Pile Driver (Impact)	**upper range**	1.158	112
	typical	0.644	104
Pile Driver (Sonic)	**upper range**	0.734	105
	typical	0.170	93
Clam shovel drop		0.202	94
Hydromill (slurry wall)	**in soil**	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87

EQUIPMENT	PPV AT 25 FT. (IN/SEC)	APPROXIMATE LV AT 25 FT. (VDB)
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

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 project expose people residing or working in the project area to excessive noise levels?

No Impact

The project area is not within the vicinity of a private or public airstrip or within the vicinity of an airport land use plan. Therefore, no impacts associated with excessive private airplane noise would occur.

4.2.14 Population and Housing

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The project site is located in a residential neighborhood community of the Town of Fairfax. The General Plan land use designations surrounding the project site include low density residential and medium density residential. Surrounding land uses include San Anselmo Creek and residential homes.

DISCUSSION OF IMPACTS

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

The proposed project would rehabilitate an existing bridge. No residential development or permanent employment opportunities would result from project implementation. No population growth is anticipated as a result of the project. No impact would occur.

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

No Impact

The proposed project would improve the existing Creek Road Bridge. No houses are planned for removal and no people would be displaced. No impact would occur.

4.2.15 Public Services

Would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
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:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The Ross Valley Fire Department (RVFD) currently provides fire protection and emergency response services to the communities of Ross, San Anselmo, Sleepy Hollow and Fairfax. The RVFD operates four fire stations. RVFD Station 21 provides fire protection and paramedic services to the project site. Station 21 is located at 10 Park Road. The project site is within approximately one mile of the station.

The Town of Fairfax Police Department (FPD) provides police protection services to the project site. The FPD employs 11 full-time Police Officers, 2 Reserve Police Officers, 4 full time Police Dispatchers, 1 Community Services Technician and 4 part time Police Dispatchers. The FPD station is located at 44 Bolinas Road. The project site is within approximately one mile of the station.

There is only a single school in the immediate vicinity of the project site. The Sir Francis Drake High School is approximately one mile northeast of the project site.

The recreational parks within the general vicinity of the project site are Contratti Park Baseball Field and Doc Edgar Park.

DISCUSSION OF IMPACTS

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:

- Fire Protection?
- Police Protection?
- Schools?
- Parks?
- Other Public Facilities?

The project would not rely on the addition or alteration of any public services. No residential or commercial construction is proposed by the project. The project would not increase population in the Town that could result in additional demands for public services and therefore would not require the construction of new public service facilities or the expansion of existing public service facilities. As such, the project would not result in significant physical impacts associated with the provision of new or physically altered governmental facilities.

i) ***Fire protection?***

No Impact

The RVFD would continue to provide fire protection services to the project site upon development. As discussed in Impact 4.14-a, the project would not include construction of any residential structures or result in an increase in residential population. Therefore, the project would not induce population growth which would necessitate the expansion of existing or construction of new fire protection facilities. Therefore, no impact would occur related to fire protection services.

ii) ***Police protection?***

Less-than-Significant Impact

During construction, a minor demand for additional FPD services may occur during the project's construction phase. Such services include, but may not be limited to, consultation during plan check, routine surveillance of the construction site by regular patrol units, potential investigations of theft of or vandalism to construction equipment and materials, and enforcement of local speed limits near the construction site. These services are routine for construction projects and would not generate demand for police services which would require the need for new or expanded police facilities. The operational phase of the proposed project would not result in increased service call responses from the FPD, due to the lack of residential or commercial development. It is not anticipated that the project would necessitate the expansion of existing or construction of new police protection facilities. Therefore, project impacts related to police protection services would be less than significant.

iii) ***Schools?***

No Impact

As discussed in Impact 4.14 (a), the project would not include construction of any residential structures. The project would not result in an increase of population that would require additional school facilities. There would be no impact.

iv) ***Parks?***

No Impact

As discussed in Impact 4.14 (a), the project would not include construction of any residential structures. As the project would not induce population growth, the project would not create a need for additional park or recreational services. There would be no impact.

v) ***Other public facilities?***

No Impact

As discussed in Impact 4.14 (a), the project would not include construction of any residential structures. As the project would not induce population growth, the project would not create a need for other public facilities including public libraries, public hospitals and medical centers, and community centers. There would be no impact.

4.2.16 Recreation

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	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?	☐	☐	☐	☒
b)	Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The recreational parks within the general vicinity of the project site are Contratti Park Baseball Field and Doc Edgar Park. Doc Edgar Park is the closest recreational facility to the site located approximately 0.2 miles away. The park contains amenities such as benches, dog walking facilities, and a grassy field.

DISCUSSION OF IMPACTS

a) 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?

No Impact

The proposed project would not involve any additional housing or businesses that could increase the use of recreational facilities in the project area. The project would rehabilitate an existing bridge. Physical deterioration of the recreational facilities would not be affected by the project. No impact would occur.

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

No Impact

The project would not require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. The purpose of the project is to rehabilitate existing bridges. No impact regarding recreational facilities would occur.

4.2.17 Transportation

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☒	☐	☐
b)	Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐
c)	Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
d)	Result in inadequate emergency access?	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The proposed project includes repairs to the existing Creek Road Bridge within the Town of Fairfax. Major streets in Fairfax are classified as arterial, collector, and local. Arterials carry regional trips and traffic between areas of the Town while providing access to major traffic generators. Collector streets link neighborhoods to arterial streets and carry traffic for short segments in residential and commercial areas, while local streets provide direct access to parcels and residences. Many streets in the Town Center serve both collector and local street functions. All two-way roadways are two-lane, though on many streets, especially on the hillsides, it is impossible to pass oncoming traffic at the narrowest points. Creek Road and Dominga Avenue are designated "Local" and Bolinas Road is designated as "Arterial" within the General Plan. There are no "Principal Arterial" Roadways, as designated by the Congestion Management Program, in or adjacent to the project site (Transportation Authority of Marin 2021). There are no intersections on either approach to the Creek Road Bridge.

DISCUSSION OF IMPACTS

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less-than-Significant Impact with Mitigation Incorporated

The bridge will be closed off to motorized, pedestrian and bicycle traffic for approximately 4 months, the length of the dry season (April 15-October 15). An approximately 0.5-mile detour would be provided via Porteous Avenue and Creek Road and would result in minimal delays (approximately 1 minute by car and eleven minutes by foot). Permanent on-street parking will not be impacted. Temporary parking loss in the active work zone may occur where the construction work is active.

The project would not significantly affect alternative transportation routes in the project area. Temporary construction impacts would result in temporary limited access for motorized and non-motorized vehicles, and pedestrians. Mitigation Measure TRANS-1 would reduce these impacts to less than significant.

Mitigation Measure TRANS–1: Traffic Control Plan

Prior to construction activities at the project site, a traffic control plan shall be prepared for implementation throughout project construction. The traffic control plan shall be subject to review and approval by the Town prior to implementation. The traffic control plan shall contain the provisions such as the following:

1. At least one week prior to the commencement of construction work, the Town shall require the contractor to provide project information signs to notify drivers of the upcoming project and potential delays.
2. Lane closure and traffic control during project construction will conform to the California Manual on Uniform Traffic Control Devices (CAMUTCD), Caltrans standard plans and specifications.
3. The contractor will install advance warning signs to alert bicyclists and motorists of the construction work zone and lane closures. Advance warning signs may be reflective signs, changeable message boards, cones, and barricades. All temporary signage related to construction work shall be removed by the construction contractor after project construction work has finished.
4. Flagging and other means of traffic control will be required to allow for the safe movement of traffic through the work zone. The contractor will provide flaggers to temporarily hold traffic for staging equipment or construction.
5. Work shall be performed in a manner that is least disruptive to the public. The contractor will consult and coordinate with the property owner if access will be affected.
6. The Town shall coordinate with local emergency services (i.e., the police and fire departments) to inform them of temporary construction work and potential road closures. Emergency access shall be maintained throughout the project duration.

With implementation of a traffic control plan and the temporary nature of construction-related traffic, impacts on traffic would be less than significant.

b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less-than-Significant Impact

According to CEQA Guidelines Section 15064.3, Subdivision (b), a project's effects on automobile delay do not constitute significant environmental impacts. Instead, vehicle miles traveled (VMT) is the most appropriate measure of the project's impact on transportation; and projects that would reduce VMT in their vicinity should be considered to have a less-than-significant transportation impact.

The project would lead to a temporary, minimal increase in VMT due to the transportation of construction equipment and personnel, as well as a temporary, small increase in VMT due to the road closure and detour during construction. Construction equipment would be staged near the

project site, minimizing construction VMT and making this increase less than significant. The temporary detour would impact a small number of residents and the likely detour routings to be established would not appreciably increase the total distances traveled.

In the long-term, the project would not lead to any increase in VMT. The replacement bridge would not contain a new path or additional features which might accommodate increased vehicles. As no substantial increases in VMT are anticipated to result from the project, the project would be consistent with CEQA Guidelines Section 15064.3, subdivision (b); and a less than significant impact would occur.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

No Impact

The project would not involve new road construction or activities that could increase hazards due to a design feature or incompatible uses. Adequate sight distance would be available for motorists to access and depart the project Area. The proposed project would include seismic retrofit of an existing bridge and operation of the proposed project would return to existing conditions.

d) Result in inadequate emergency access?

Less-than-Significant Impact with Mitigation Incorporated

The bridge will be closed off to emergency service vehicles (EMS) during the duration of construction. EMS traffic would be required to follow detours around the project site. However, as stated above, the detour route is short in duration and would cause slight to no delays. The construction contractor shall coordinate with law enforcement and emergency service providers prior to the start of construction to ensure minimal disruption to service during construction. Implementation of Mitigation Measure TRANS-1 would reduce temporary construction related impacts to emergency access for Creek Road to less-than-significant by providing proper detour signage and warnings.

4.2.18 Tribal Cultural Resources

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	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 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)?*	☐	☒	☐	☐
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.*	☐	☒	☐	☐

ENVIRONMENTAL SETTING

A description of the environmental setting related to tribal cultural resources can be found in *Section 4.2.5, Cultural Resources*.

REGULATORY SETTING

Tribal Cultural Resources Assembly Bill 52 (AB 52)

AB 52 (Chapter 532, Statutes 2014) required an update of the CEQA Guidelines to include questions related to impacts to tribal cultural resources. AB 52 establishes a consultation process with all California Native American Tribes on the Native American Heritage Commission List, Federal and Non-Federal Recognized Tribes. AB 52 also establishes a new class of resources: Tribal Cultural Resources. Key components of AB 52 include consideration of Tribal Cultural Values in determination of project impacts and mitigation and required Tribal notice and meaningful consultation.

PRC Section 21080.3.2(b) states that consultation ends when either 1) parties agree to mitigation measures or avoid a significant effect on a tribal cultural resource, or 2) a party, acting in good faith and after reasonable effort concludes that mutual agreement cannot be reached.

State of California Public Resources Code

Section 21074 of the PRC defines historical resources related to tribal cultural resources.

a) "Tribal cultural resources" are either of the following:

a. Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

    A. Included or determined to be eligible for inclusion in the California Register of Historical Resources.

    B. Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

b. 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 Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

b) A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.

c) A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Section 5020.1(k) defines "Local register of historical resources" as a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution.

Section 5024.1 is the establishment of the California Register of Historical Resources (California Register).

Native American Consultation

Pursuant to AB 52, on January 8, 2026, the Town sent a letter to Buffy McQuillen of the Federated Indians of Graton Rancheria soliciting the Tribe's input on the project. The Town followed up via email on February 3, 2026 to confirm receipt of the letter and solicit input on the project. No response has been received to date.

DISCUSSION OF IMPACTS

a) 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 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)?

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 with Mitigation Incorporated

In accordance with AB 52, Graton Rancheria was notified of the project on January 8, 2026, after having been present on site for the subsurface cultural resources investigation completed in 2023 and having been consulted about the project prior to those investigations. The Town followed up on the AB 52 notice after it was sent; however, no responses were received from Graton Ranchera, therefore no further consultation was undertaken beyond that completed in past years. No tribal cultural resources have been identified within the project site.

Although Graton Rancheria was not responsive to the project notification letter sent pursuant to AB 52, the Town is aware that the tribe previously expressed interest in tribal monitoring for the project during the National Environmental Policy Act (NEPA) review process. As such, the Mitigation Measure TCR-1 will be implemented, which requires the Town to reach out to Graton Rancheria one more time no less than 30 days prior to construction to confirm whether they would like to send a tribal monitor to observe project excavation work. Implementation of Mitigation Measure TCR-1, along with CUL-1 and CUL-2, would ensure that the project would not have a significant adverse effect on tribal cultural resources. The impact would be less than significant with mitigation incorporated.

Mitigation Measure TCR-1. Outreach to the Federated Indians Graton Rancheria

The Town of Fairfax shall reach out to Graton Rancheria no less than 30 days prior to construction to confirm whether they would like to have a tribal monitor present during excavation activities. If requested by Graton Rancheria, the Town shall arrange to have a tribal monitor present during excavation work.

4.2.19 Utilities and Service Systems

Would the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐
c)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
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?	☐	☐	☒	☐
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

The project site is located within a developed residential area of the Town that provides all utilities and services (e.g., water supply and distribution, sewage distribution and treatment, storm drainage facilities, and solid waste management). Electrical and other utility lines are also located along the roads, either underground or aboveground. The proposed project includes seismic retrofit of an existing bridge. The construction phase of the project would require use of solid waste disposal. There are existing water lines and storm drainage pipes running along the bridge.

Water Service

Established in 1912, the MMWD provides drinking water to 187,500 customers in central and southern Marin County. Seventy-five percent of the water comes from more than 21,000 acres of protected watershed on Mt. Tamalpais and in the grassy hills of west Marin. Rainfall from these

watersheds flows into one of MMWD's seven reservoirs. This reservoir water is then treated at one of the district's potable water treatment plants before traveling to customers' homes and businesses.

Storm Drainage

The 28-square mile Corte Madera watershed extends from Mt. Tamalpais and White's Hill through the communities of Fairfax, Sleepy Hollow, San Anselmo, Ross, Kentfield, Greenbrae, Larkspur, and Corte Madera to San Francisco Bay. The watershed includes 44 miles of stream channels. Ross Creek drains the northern slope of Mt. Tamalpais; San Anselmo Creek and its tributaries drain the northwestern portion of the watershed. The two channels join to form Corte Madera Creek, which continues through more than a mile of concrete-lined channel past the confluences of Larkspur and Tamalpais Creeks and into the salt marsh at the mouth.

The principal natural hydrological sources for the project site are creek flows, direct precipitation and surface run-off from adjacent lands. San Anselmo Creek flows though the project site towards the north/northeast. Just north of the project site, Deer Creek joins San Anselmo Creek. Roughly one quarter of a mile to the north, it joins Fairfax Creek and turns east, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. In wet years, the creek at this location is perennial. At the time of the fieldwork, in a drought year, the flows were low.

The storm water drainage pipes within the Town are maintained by the Town of Fairfax Department of Public Works.

Solid Waste

The Marin Sanitary Service provides waste disposal services for the site. According to the Marin Countywide Plan, there are two permitted landfills operate in the county. The Redwood Landfill would be the most likely to service the project's solid waste disposal needs.

DISCUSSION OF IMPACTS

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less-than-Significant Impact

An existing 6" waterline at the east abutment and possibly a 4" PVC waterline at the west abutment could interfere with the proposed waffle slabs. If this is the case, these utilities would be relocated by MMWD. Additionally, a 12"-diameter corrugated metal pipe storm drain pipe crossing Creek Road and daylighting at the south creek bank slightly downstream of the bridge interferes with the abutment's waffle slab at the east end of the bridge and would be redirected around the slab.

This would take place by abandoning the current pipe, excavating a sloped trench in the street and the adjacent creek bank and placing a new length of 12" corrugated metal pipe below the surface to daylight at the current location. The trench would be covered back up and the street pavement restored. Where the existing pipe daylights currently, the creek bank has been eroded.

A 6' wide by approximately 20' long by 2' deep course of riprap would be placed flush with the surface of the creek bank just below where the flows exits the pipe in order to stop and prevent further bank erosion.

The project would improve storm water drainage in the area surrounding the project area by abandoning the current pipe and redirecting a new storm drain pipe. The addition of rip rap near the existing pipe would reduce ongoing creek bed erosion. As discussed in other sections of this report, all potentially significant impacts related to trenching and construction within the creek would be reduced to less-than-significant levels via the implementation of Mitigation Measure BIO-4, which provides measures to minimize impacts to creek habitat from use of power tools in the creek bed.

No other public utilities such as wastewater treatment, electric power, natural gas, or telecommunications facilities would need be constructed, expanded, or relocated. As impacts associated with the relocation of waterlines would be mitigated to less-than-significant levels and no other impacts to public facilities would occur, the project would not cause significant environmental effects through construction or relocation of any such facilities, and impacts would be less than significant with mitigation incorporated.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

Less-than-Significant Impact

The proposed project would rehabilitate an existing bridge. No water is anticipated to be needed during operation. Water supply for dust control during construction would be provided by existing service providers with sufficient supplies to serve the project's small, temporary water needs. Therefore, there would be sufficient water supplies to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years; and impacts would be less than significant.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

No Impact

The project would not generate wastewater and would not impact wastewater treatment or capacity. No new distribution facilities would be constructed or needed as part of the project. Therefore, no impact to wastewater capacity would occur.

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

Local waste reduction efforts are overseen by Zero Waste Marin, a joint powers authority comprised of representatives of Marin County and each of the County's constituent cities. Zero Waste Marin works with businesses and residents to reduce solid waste and move towards Marin County's goal of zero waste by 2025. Among these efforts, Zero Waste Marin encourages the use of certified disposal facilities during demolition and construction projects to ensure that

materials are recycled to the fullest extent feasible, in keeping with state requirements that most construction and demolition projects divert 65% of waste.

The project would generate a small quantity of solid waste during construction, but all generated waste would be properly disposed or recycled in an approved landfill or disposal facility with capacity to receive the waste. Solid waste would be disposed of at the Redwood Landfill, a certified landfill. Redwood Landfill is anticipated to have capacity through 2025; so the project's solid waste would be insufficient to exceed remaining capacity. Further, Zero Waste Marin encourages disposal at certified facilities to ensure that materials are recycled to the greatest extent feasible. By recycling at Redwood Landfill, the project would maximize its potential for recycling, in keeping with state and local waste reduction efforts.

As the project would dispose of its solid waste at a certified facility with adequate permitted capacity, the project would not generate solid waste in excess of state or local standards or local infrastructure or otherwise impair the attainment of solid waste reduction goals. Thus, a less-than-significant impact would occur.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less-than-Significant Impact

Marin County has a goal of zero waste by 2025. The joint powers authority overseeing zero waste efforts, Zero Waste Marin, encourages disposal at a certified facility during construction and demolition to comply with state waste reduction requirements. The project would dispose of solid waste at Redwood Landfill, a certified landfill. The project would therefore comply with local and state requirements for solid waste reduction. No federal solid waste reduction requirements applicable to the project were identified. As the project would comply with local and state requirements and no federal requirements were identified, a less-than-significant impact would occur.

4.2.20 Wildfire

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
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?	☐	☐	☒	☐
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?	☐	☐	☐	☒
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?	☐	☐	☒	☐

ENVIRONMENTAL SETTING

Pursuant to Government Code Section 51175-89, the California Department of Fire and Forestry (CAL FIRE) recommends Fire Hazard Severity Zones (FHSZ) throughout the state. These are mapped taking relevant factors such as fuels, terrain, and weather into account. FHSZ are described based on their potential to cause building ignition. Areas assessed for fire hazards throughout the state are categorized as local responsibility areas and state responsibility areas depending on the entity responsible for fire protection.

The Ross Valley Fire Department (RVFD) currently provides fire protection and emergency response services to the communities of Ross, San Anselmo, Sleepy Hollow and Fairfax. The RVFD operates four fire stations. RVFD Station 21 provides fire protection and paramedic services to the project site. The project site is within approximately one mile of Station 21, located at 10 Park Road in Fairfax.

CAL FIRE classifies the site and its surroundings as being within a High FHSZ in the local responsibility area (CAL FIRE 2025). The nearest state responsibility area is approximately 0.5 miles from of the project site on the southern border of Fairfax. The nearest Very High FHSZ is in the state responsibility area located approximately 0.5 miles west of the project site.

DISCUSSION OF IMPACTS

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

Less-than-Significant Impact

The project site is not within a state responsibility area or a very high fire hazard severity zone but is near a state responsibility area. During construction the Creek Road Bridge would be closed, and detours would be established to and away from the bridge via Creek Road and Porteous Avenue in the direction away from the bridge towards Bolinas Road. Mitigation Measure TRANS-1 would address lane closures and traffic control during construction and mitigate impacts to emergency response and evacuation to less-than-significant levels. Thus, the project would not substantially impair an adopted emergency response or evacuation plan, and impacts would be less than significant with mitigation incorporated.

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

The project could temporarily exacerbate existing wildfire risk through the presence of motorized construction equipment powered by flammable fuels. However, compliance with construction site best management practices as outlined in Mitigation Measures AIR-1 and HYDRO-1 would reduce the potential for fuel ignition. Any increased risk would be small and temporary and would not substantially increase the likelihood of exposure to pollutants from wildfire or uncontrolled spread of wildfire. In the long term, the project would not alter the operations of the existing bridge and no changes to the structure would exacerbate wildfire risk. As fire risk increase during construction would be minimal and there would be no permanent risk increase, the project would not exacerbate wildfire risk, and impacts would be less than significant.

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?

No Impact

The project is a bridge seismic retrofit that does not require the construction of any associated infrastructure such as roads, fuel breaks, emergency water sources, power lines, or other utilities that may exacerbate fire risk or result in temporary or ongoing impacts to the environment. As such, no impact would occur.

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

Downstream areas roughly 0.6 miles south of the project site are considered moderately high fire hazard severity zones in the state responsibility area. These areas could be vulnerable to slope

instability following a fire. However, the project would not alter drainage patterns or result in runoff in these areas. The bridge has been designed to clear the high-water mark, even during high flow events. Although there are areas prone to wildfire downstream, as detailed above the project would not alter the chance of downstream flooding or landslides. Thus, a less than significant impact would occur.

4.2.21 Mandatory Findings of Significance

Does the project:		*Potentially Significant Impact*	*Less-than-Significant Impact with Mitigation Incorporated*	*Less-than-Significant Impact*	*No Impact*
a)	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?	☐	☒	☐	☐
b)	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)?	☐	☒	☐	☐
c)	Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

DISCUSSION OF IMPACTS

a) Does the 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

The incorporation of the mitigation measures included in *Section 4.2.4 Biological Resources* would reduce potential impacts to fish, wildlife, plants, and habitat to a less-than-significant level. The project site does not contain any resource listed in, or determined to be eligible by, the State Historical Resource Commission and does not contain a resource included in a local register of historic resources or identified as significant in a historical survey. Additionally, the project site does not contain any object, building, structure, site, area, place, record, or manuscript that a lead agency determined to be historically significant. However, cultural resources could potentially be uncovered during construction. Mitigation measures included in *Section 4.2.5,*

Cultural Resources and *Section 4.2.15, Tribal Cultural Resources*, would reduce potential impacts to be a less-than-significant level.

b) Does the 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

Section 15130 of the CEQA *Guidelines* requires an evaluation of potential environmental impacts when the project's incremental effect is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual 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. These impacts can result from a combination of the proposed project together with other projects causing related impacts. The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

The bridge repairs would not change the use of the roadway or the bridge. Therefore, project impacts that could contribute to a cumulative impact are predominately short-term and temporary construction related impacts focused within the project vicinity. The Town's paving program plans repaving work on Bolinas Road during Fiscal Year 2028-2029 from Broadway to Deer Park Villa, which is in proximity to the Creek Road Bridge. Creek Road is also planned for repaving in Fiscal Year 2028-2029 from Blackberry Lane to Bolinas Road. The Town, as manager of each of these projects as well as the proposed project, would ensure that work is appropriately staggered so that cumulative construction impacts do not occur. There are no other construction projects planned within the immediate vicinity of the project site which could contribute to a cumulatively considerable impact resulting from project construction.

The project would implement mitigation measures to ensure that significant impacts related to air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, transportation, and tribal cultural resources would not occur.

Mitigation Measure AIR-1 includes the implementation of BAAD-recommended dust control measures to ensure that the project would not generate levels of fugitive dust that would contribute to a cumulative air quality impact. The BAAD does not establish significance thresholds for fugitive dust emissions but considers projects that implement the BAAD-recommended BMPs to have a less-than-significant impact related to cumulative fugitive dust emissions. The project would cause a temporary increase in emissions in the area during construction; however, operation of the project would not constitute a new source of emissions or an increase in emissions. The post-project emissions conditions would be similar to existing conditions. Therefore, the project would not result in a cumulative air quality impact.

Mitigation Measures BIO-1a, BIO-1b, and BIO-2 would ensure that the project would not result in a significant impact to special-status wildlife species during construction. Mitigation Measure BIO-1a requires measures to ensure that the project would not result in permanent impacts to

steelhead individuals or their habitat. Measures to avoid temporary impacts include preparation of an Accidental Spill Prevention and Cleanup Plan, implementation of a fish salvage plan, avoidance of in-channel work during the wet season, isolating work areas from flowing water, and others. This measure also requires that the creek banks and channel be restored to the original conditions and grade to mimic pre-project conditions. With these measures, the post-project creek conditions would be similar to existing conditions, and a cumulative or permanent impact to steelhead or steelhead habitat would not occur. Mitigation Measure BIO-1b requires that pre-construction nesting bird surveys be conducted, and appropriate no-work buffers be implemented if active nests are found. With this measure, the project would not result in a significant cumulative impact to nesting birds or their habitat. Mitigation Measure BIO-2a would ensure that temporary impacts to riparian woodland habitat during construction would not threaten the survival of riparian woodland habitat in the project site, thus resulting in a permanent impact to riparian woodland habitat. Mitigation Measure BIO-3 would include measures to avoid or minimize potential impacts to creek habitat resulting from the use of mechanical equipment in the creek bed. Consultation with appropriate regulatory agencies would occur for permanent impacts to the creek, and the project would implement all agreed upon mitigation measures. Therefore, the project would not result in a significant cumulative impact to biological or hydrological resources.

There are no known archaeological or paleontological resources within the project site, and the project would implement Mitigation Measures CUL-1, CUL-2, and GEO-1 to ensure that the project would not have a significant impact on unknown archaeological resources, paleontological resources, or human remains. Potential impacts to cultural resources and paleontological resources are site-specific and would not contribute to a cumulatively considerable impact.

The project has the potential to result in soil erosion which could result in loss of topsoil or siltation of nearby waterways. Mitigation Measures BIO-3 and HYDRO-1 would be implemented to reduce potentially significant impacts to a less-than-significant level. These measures include BMPs such as silt fencing, jute mesh, straw wattles, compliance with the RWQCB's Erosion and Sediment Control Field Manual, and post construction erosion monitoring. All disturbed areas would be restored to their original grade and revegetated, which would prevent excessive erosion post-construction. Because measures would be implemented to ensure that erosion does not occur from post-project conditions, the project would not contribute to a cumulatively considerable erosion impact.

During construction, the project would require temporary closures of Creek Road. Mitigation Measure TRANS-1 which requires controls for traffic delays that may occur throughout construction. This measure would also ensure that adequate emergency access is provided throughout the project area during construction. The Town's paving program plans repaving work on Bolinas Road during Fiscal Year 2028-2029 from Broadway to Deer Park Villa, which is in proximity to the Creek Road Bridge. Creek Road is also planned for repaving in Fiscal Year 2028-2029 from Blackberry Lane to Bolinas Road. The Town, as manager of each of these projects as well as the proposed project, would ensure that work is appropriately staggered so that access is maintained for residents throughout the periods when these projects are active. There are no other projects planned within the immediate vicinity of the project site which would contribute to a cumulatively considerable transportation impact due to project construction. Once construction work on-site is finished, the transportation conditions would remain the same as existing

conditions. Therefore, the project would not contribute to a cumulatively considerable impact related to transportation or emergency access.

Construction work would generate noise during working hours, which is a temporary impact. The project would implement Mitigation Measure NOISE-1 to minimize noise from the project site to the maximum extent possible. Once construction is complete, noise conditions around the project site would be the same as existing conditions. Therefore, the project would not contribute to a cumulatively considerable noise impact.

Given that the project does not result in any significant impacts that cannot be mitigated to less-than-significant levels, the temporary nature of construction related impacts, and compliance with all regulations adopted to protect the environment, the proposed project would not result in impacts that are cumulatively considerable.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Less-than-Significant Impact with Mitigation Incorporated

The project, particularly during the construction phase, could result in a variety of temporary impacts to human beings. The project's construction phase would result in potentially significant impacts related to air quality, biological resources, cultural resources, geology and soils, hazardous materials, hydrology and water quality, noise, traffic, and tribal cultural resources; however, all impacts can be mitigated to less-than-significant levels via the mitigation measures included in this Initial Study/Proposed Mitigated Negative Declaration.

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APPENDIX A. NATURAL ENVIRONMENT STUDY

Creek Road Bridge

Proposed Seismic Retrofit



Natural Environment Study

Creek Road Bridge Seismic Retrofit

Town of Fairfax, Marin County

Bridge Number: 27C 0144

Project Number: STPLZ 5277 (027)

Locator: [District 4]-[MRN]-[0]-[FRFX]

June 2016

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Creek Road Bridge
Proposed Seismic Retrofit
Natural Environment Study

STATE OF CALIFORNIA
Department of Transportation
Town of Fairfax
STPLZ 5277 (027)

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Summary

Purpose and Need

Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek, in the Town of Fairfax was constructed in 1929. The bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the Maximum Credible Earthquake (MCE), potentially resulting in the loss of life. Retrofit concepts and costs to address the bridge's seismic deficiencies were presented in a Seismic Retrofit Report submitted to Caltrans. For retrofit repairs, Caltrans approved Alternate 2 of the Seismic Retrofit Strategy Report; the construction elements are described below.

Project Description

To perform the work, bridge components in the creek would be accessed by lowering equipment, containers and materials from the bridge deck using a crane. Storage of constructions materials, tools and vehicles would be limited to Wessen Lane and locations within the Creek Road Bridge Seismic Retrofit Project Biological Study Area (BSA). The key elements of the retrofit work are:

1. Construction duration would include one dry season (usually April 15 through October 15) for work in the creek, when the flows are minimal, as well as, a few weeks at each end of this period for the work above at the street level.
2. Infill walls between each pair of columns at Bents 2-4 would be constructed as follows. A trench would be excavated to the dimensions required for work on that bent; then walls would be built as discussed in the full project description. To protect aquatic resources, the contractor would be required to submit and implement a dewatering plan. The soils excavated at the bents would be stored in uplands, and used for backfill upon completion.
3. The concrete spalls on the underside of the bridge deck slab, the girders, the columns and the bent cap beams would be repaired.
4. At each of the two abutment locations, the approach roadways would be excavated. A waffle slab configuration would be installed under the roadway to act as an anchor system to keep both the transverse and longitudinal seismic movements of the bridge in check.
5. Utilities would be adjusted as required and the current stormdrain pipe that conflicts with the waffle slab past the east end of the bridge would be abandoned and replaced by excavating a sloped trench in the street and the adjacent creek bank. Then, a new length of 12" CMP would be placed below the surface to daylight where the existing pipe daylights. Because the creek bank has eroded in this area, rock riprap would be placed flush with the surface of the creek bank just below where the flows exit the pipe (to prevent further bank erosion). The rock riprap would extend down to the creek bed.
6. The deck surface would be repaired and joint seals at each bent would be replaced.

Upon the completion of the work in the creek, the area would be restored and mitigation implemented.

Habitat Impacts

The proposed project would temporarily impact 35 square feet (less than 0.01 acre) of Riparian Woodland, 3,287 square feet (less than 0.07 acre) of Perennial Stream (comprised of 22 square feet (less than 0.01 acre) of wetlands and 3,265 square feet of "other waters" (less than 0.07 acres), and 416 square feet (0.01 acre) of Unvegetated Bank habitats. It would permanently impact 121 square feet (less than 0.01 acre) of Riparian Woodland, 20 square feet (less than 0.01 acre) of Perennial Stream (all "other waters", no wetland), 58 square feet (less than 0.01 acre) of Unvegetated Bank, and 805 square feet (0.02 acre) of Ruderal Disturbed/Developed lands.

Special-Status Species

The proposed project would not adversely affect special-status plants, breeding birds, or other non-fish wildlife species. However it **may affect, likely to adversely affect** Central California Coast (CCC) steelhead, a federally threatened species, and designated critical habitat for CCC steelhead and Coho salmon, and Pacific Salmonid Essential Fish Habitat (EFH). Consultation with National Marine Fisheries Service (NMFS) would be required to assess impacts of the proposed project as well as avoidance and minimization measures to be implemented to negate impacts on steelhead and designated critical habitat for steelhead and Coho salmon.

Construction of the proposed project would result in temporary impacts to CCC steelhead and EFH; however, no permanent adverse impacts are anticipated to the species, its critical habitat, or EFH. The proposed project is scheduled to occur during the time steelhead are least likely to be present and passing through the BSA, and following consultation with NMFS, a fish salvage would be conducted to relocate any steelhead present during project de-watering activities. The bridge work would add material to the existing structures but would not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream. The stream channel and banks would be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists. Restoration would use the excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. As such, the proposed project would not change fish passage conditions and is not anticipated to impact spawning habitat. The proposed project would however result in a minor loss of habitat for this species and temporary impacts to steelhead are anticipated during project activities. Therefore, the proposed project **may affect, likely to adversely affect** steelhead and critical habitat.

Invasive Species

The invasive plant species found in the BSA are fennel (*Foeniculum vulgare*), English ivy (*Hedera helix*), French broom (*Genista monspessulana*), and Himalayan blackberry (*Rubus armeniacus*). The proposed project would remove individuals of these species in areas where the vegetation is disturbed by construction activities; and replace them with California blackberry or other appropriate native species.

New Zealand mud snail (NZMS; *Potamopyrgus antipodarum*) are documented within San Anselmo Creek. Measures such a washing equipment are included here to avoid the spread of the mud snail. With implementation of the avoidance and minimization efforts discussed in this text, the proposed project would not result in the spread of invasive species.

Resource Permits

There would be impacts to the Perennial Stream (i.e. “other waters” or ‘Waters’) and wetlands. A preliminary Jurisdictional Determination would be submitted to the United States Army Corps of Engineers (USACE) for verification. Permits that would be required include a California Department of Fish And Wildlife (CDFW) Streambed Alteration Agreement (CFGC 1602), Regional Water Quality Control Board (RWQCB) Clean Water Act (CWA) 401 certification, and USACE CWA 404 nationwide permit. In June 2015, CDFW and RWQCB indicated that mitigation will be necessary. Mitigation that complies with the permit requirements will be developed and implemented.

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Table of Contents

Summary i
Chapter 1 – Introduction 7
History of Proposed Project *7*
Description of the Proposed Creek Road Bridge Project *7*
Chapter 2 – Study Methods 16
Regulatory Requirements *16*
Wetland and Waters 16
Invasive Species 18
Protected Species 18
Local Policies and Ordinances 20
Studies Required *20*
Personnel and Survey Dates *22*
Agency Coordination and Professional Contacts *22*
Limitations That May Influence Results *23*
Chapter 3 – Results: Environmental Setting 24
Existing Biological and Physical Conditions *24*
Biological Study Area 24
Physical Conditions 24
Biological Conditions in the BSA 25
Invasive Species 29
Regional Species and Habitats and Natural Communities of Concern *29*
Chapter 4 – Results: Biological Resources, Discussion of Impacts and Mitigation 67
Habitats and Natural Communities of Special Concern *67*
Riparian Woodland 68
Perennial Stream (“Other Waters” And Wetlands) 71
Special-Status Plant Species *74*
Special-Status Wildlife Species *77*
Steelhead, Critical Habitat, and Fish Passage 81
Special-Status and non-Special-Status Nesting Birds 84
Chapter 5 – Conclusions and Regulatory Determinations 86
Federal Endangered Species Act Consultation Summary *86*
Essential Fish Habitat Consultation Summary *86*
California Endangered Species Act Consultation Summary *86*
Wetlands and Other Waters Coordination Summary *86*
Invasive Species *87*
Other *87*
Chapter 6 – References 88

List of Figures

Figure 1. Location Map 9
Figure 2. Proposed Creek Road Bridge Plan 11
Figure 3a. Biological Communities within the Biological Study Area 27
Figure 3b. Biological Communities Impacted within the Biological Study Area 69
Figure 4. Special-Status Plant Species within 8 kilometers (5 miles) of the Biological Study Area 75
Figure 5. Special-Status Wildlife Species within 8 kilometers (5 miles) of the Biological Study Area 79

List of Tables

Table 1: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the BSA. 31
Table 2: Direct Impacts of the Proposed Project to Natural Communities of Special Concern. 67
Table 3: Direct Impacts of the Proposed Project to Jurisdictional Areas by Agency..... 68

List of Appendices

Appendix A – Plant and Wildlife Species Observed during the Site Visits
Appendix B – USFWS Official Species List
Appendix C – Preparers Qualifications

Chapter 1 – Introduction

History of Proposed Project

The Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek, a structure in the Town of Fairfax, was constructed in 1929. The bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. The interior spans are simply supported on three sets of 2-column bents in the creek and the exterior spans are rigidly connected to an abutment at each end of the bridge. There are no as-built plans available for the bridge, but an as-built Bridge General Plan and additional structural detail sheets have been prepared for this proposed project. The bridge is not considered historic and has a value of 5 for Historical Significance (National Bridge Inventory or NBI Item No. 37). During the New Year's Eve flood of 2005, the bridge's west abutment experienced a major washout. The abutment was repaired and protected with rock riprap after a closure period. Travelers utilized other streets as a detour around the closure during the repair period. In September 2010, a Scour Plan of Action Report did not find any new significant bridge foundation scour around the bridge foundations.

The Creek Road Bridge is composed of a series of articulated simple spans sitting on top of concrete bent cap beams on 2-column concrete bents. This configuration is one of the vulnerabilities of the bridge. Since the superstructure spans are not connected to the substructure, they have the potential of unseating and collapsing during the movements induced by large seismic events. In the initial PE phase of the proposed project, during the Seismic Retrofit Strategy period, structural analyses confirmed the seismic vulnerability of the bridge. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the Maximum Credible Earthquake (MCE), potentially resulting in the loss of life. If the spans are attached to the substructure to prevent them from unseating, then the entire substructure would still flop over due to the longitudinal movement and the momentum of the superstructure, and the bridge would collapse anyway. Therefore, the substructure needs to be retrofitted as well.

Retrofit concepts and costs to address the bridge's seismic deficiencies were presented in a Seismic Retrofit Report prepared and submitted to Caltrans. For retrofit repairs, Caltrans approved Alternate 2 of the Seismic Retrofit Strategy Report; the construction work of Alternative 2 is described in detail below. The Caltrans philosophy of retrofit design for a non-lifeline facility, such as Creek Road Bridge, is to prevent its catastrophic failure and the loss of life. The bridge may sustain extensive damage, or even be inoperable after the quake, but must not collapse or endanger lives.

Description of the Proposed Creek Road Bridge Project

As part of this project description a couple of bridge terminology items should be explained. A "bent" is part of the bridge substructure and a support entity, other than an abutment. The term refers to the combination of the bridge columns, the foundation supports under the columns and the beam (bent cap) that spans the tops of the columns in the transverse direction to the bridge. The abutment is also a support, except it is located at each bridge end. The Creek Road Bridge Seismic Retrofit Project Biological Study Area (BSA) is shown on Figure 1. The plans are provided in Figure 2.

To perform the retrofit construction work, bridge areas and components in the creek

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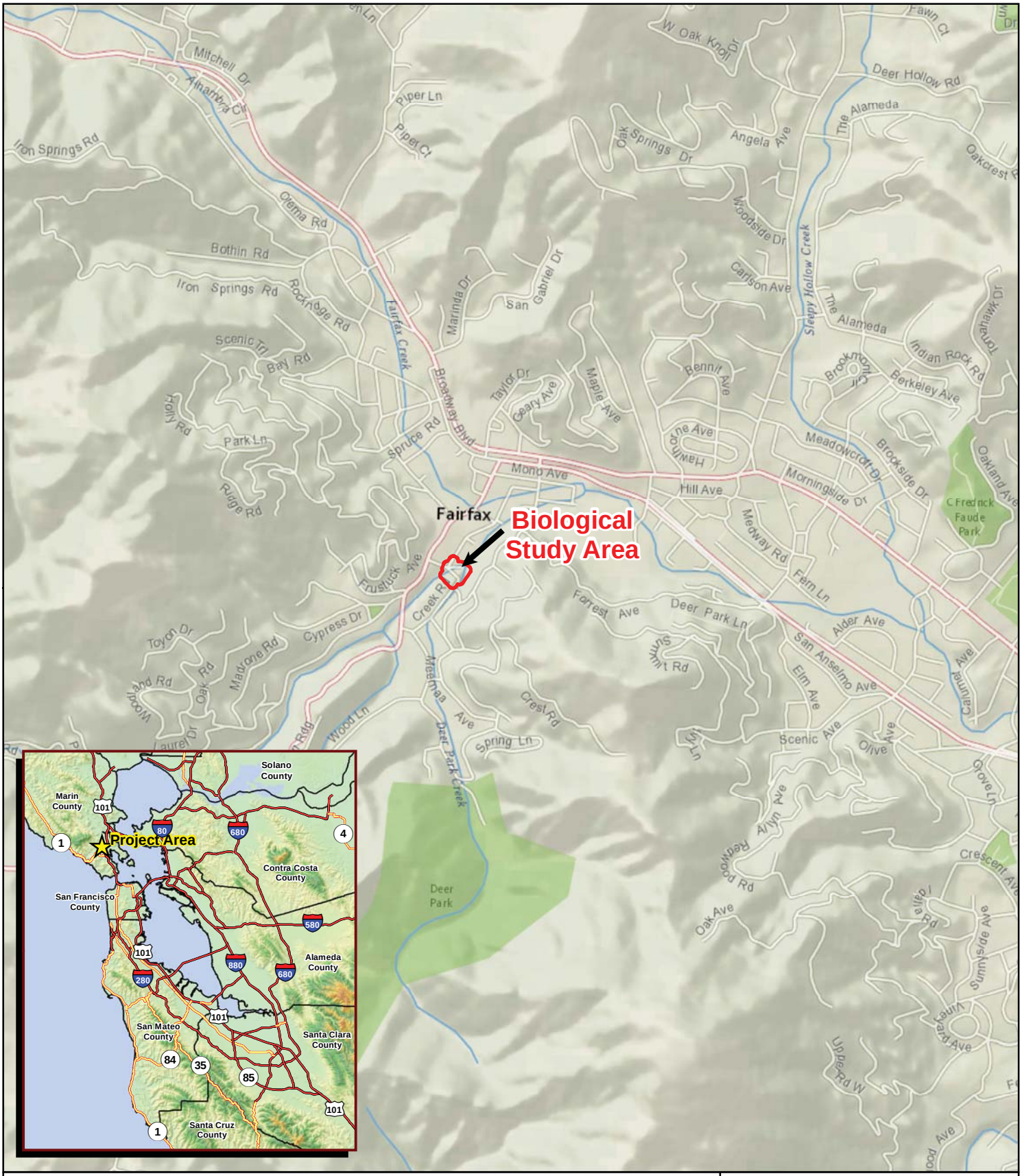


Figure 1. Location Map

Creek Road Bridge Project
Town of Fairfax, California

0 0.125 0.25 0.5
Miles

ENVIRONMENTAL CONSULTANTS

Date: October 2014
Map By: Jonathan Hidalgo
Basemap: National Geographic, ESRI Stream

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Creek Road\Figure 1. Location.mxd

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Figure 2. Proposed Creek Road Bridge Plan

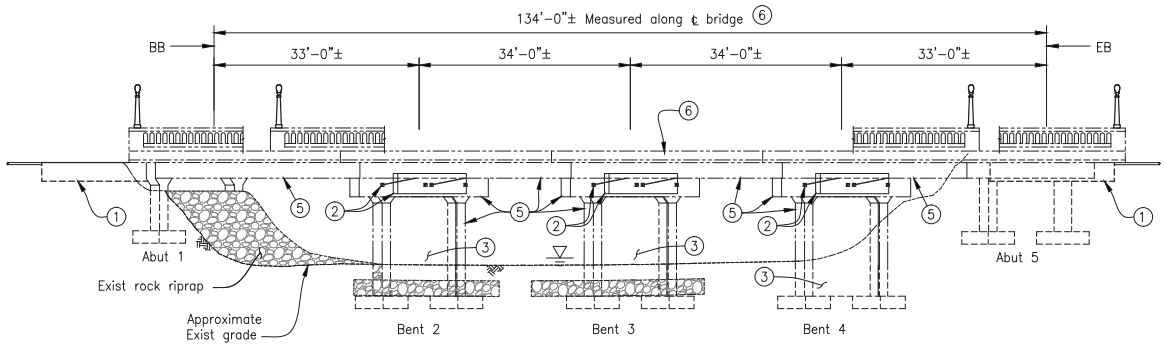
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Mrn			5	XX

REGISTERED CIVIL ENGINEER

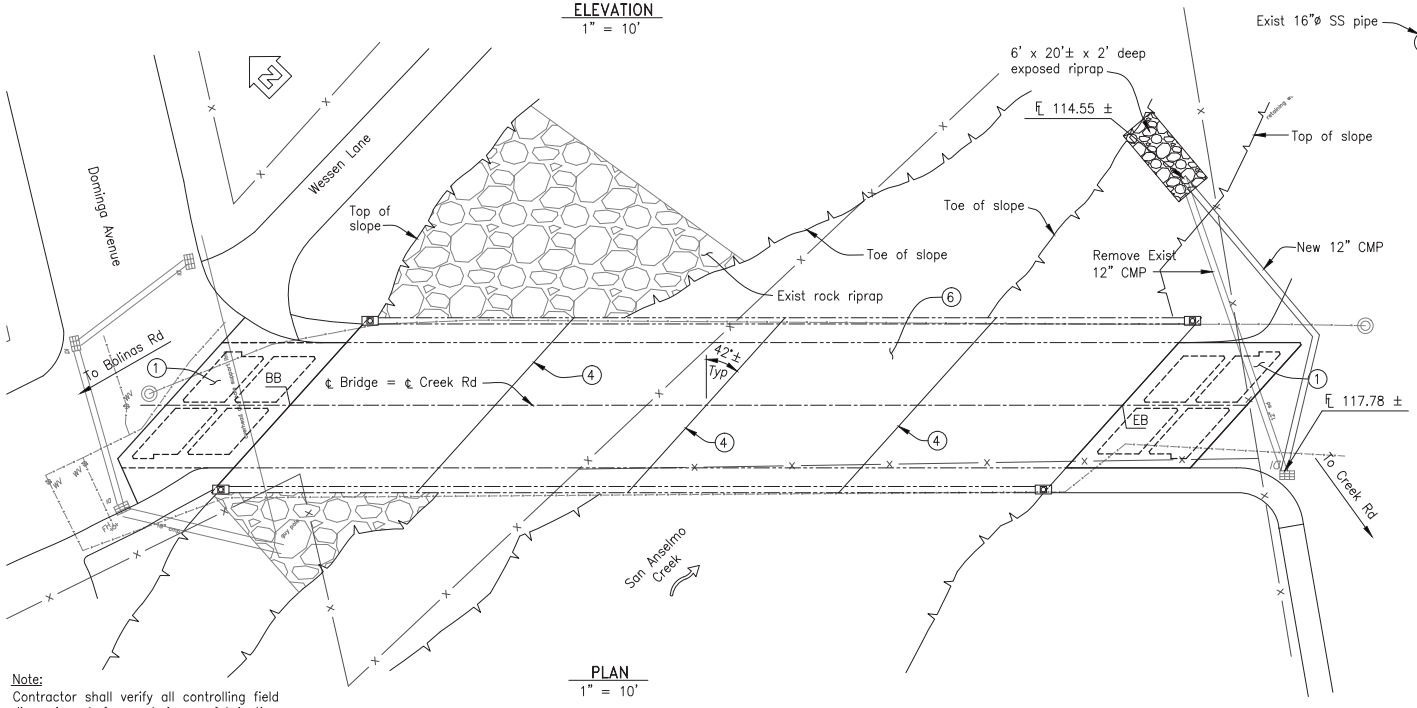
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — NADER TAMANNAIE — NO. 37289 — EXP. 6/30/16 — CIVIL — STATE OF CALIFORNIA

930 ALHAMBRA BLVD. SUITE 220
SACRAMENTO, CA 95816

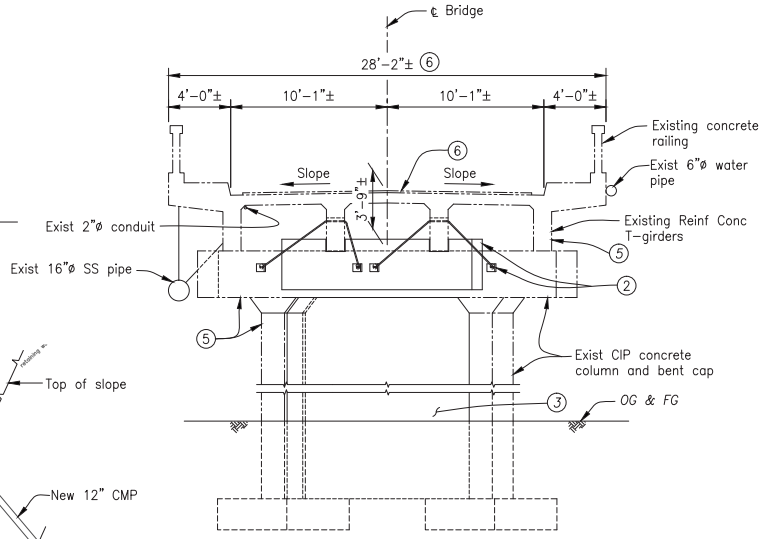


ELEVATION
1" = 10'



PLAN
1" = 10'

Note:
Contractor shall verify all controlling field dimensions before ordering or fabricating any material.



TYPICAL SECTION
1/4" = 1'-0"

RETROFIT LEGEND

1. Seismic Anchor Slab
2. Cable Restrainers and Transverse Shear Key
3. Bent Retrofit with Infill Walls
4. Repair Expansion Joint
5. Repair Spalls on Super- and Substructure
6. Remove AC and Seal with Methacrylate

Note: For Index to Plans and General Notes, see "Index to Plans" sheet.

SYMBOLS

- Indicates Existing Structure
- Indicates New Construction
- Indicates Right-of-Way Limits

DESIGN OVERSIGHT	DESIGN	BY D. Vang	CHECKED	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 AND PERMIT DESIGN VEHICLE		PREPARED FOR THE TOWN OF FAIRFAX DEPARTMENT OF PUBLIC WORKS
SIGNOFF DATE	DETAILS	BY D. Vang	CHECKED	LAYOUT	BY N. Tamannaie	CHECKED	
	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

Nader Tamannaie, PE
PROJECT ENGINEER

BRIDGE No.	EARTHQUAKE RETROFIT PROJECT
27C-0144	CREEK RD BRIDGE OVER SAN ANSELMO CREEK
POST MILE	GENERAL PLAN
--	

DS OSD 2138 (CADD 4/89)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF

\Projects\2022 Town of Fairfax\Creek Road Bridge\Project Design Plans\Creek Rd - General Plan.dwg, 11/18/2015 5:21:02 PM

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need to be accessed. Access to the creek would be by lowering equipment, containers and materials from the bridge deck using a crane. Construction equipment would include smaller wheeled vehicles and hand-held devices. A crane, pickup trucks, dump trucks, concrete delivery trucks, small loaders, excavators and generators would be present at the project site on a daily basis. The construction vehicles would be in and out of the work area on a steady basis, but may not all be present at the same time. Storage of constructions materials, tools and vehicles would be limited to Wessen Lane and locations within the BSA. Worker access to the creek would be over a footpath from the creek bank at either abutment. The approved retrofit strategy requires bridge construction elements as follows:

1. Construction duration would include one permissible dry season (usually April 15 through October 15) for work in the creek, when the flows are minimal, plus possibly a few weeks at each end of this period for the work above at the street level. The work on items 2-4 described below must take place concurrently for the in-creek work to be finished within the dry season period. Some dewatering and creek low-flow diversion through the site may be necessary. At the end of the dry season all equipment, materials and temporary access ramps would be removed from the creek and the banks and creek would be restored.
2. Close the bridge for the duration of construction and detour the traffic to other access routes. Detours to and away from the bridge site would be available via Dominga Avenue or Creek Road in the direction away from the bridge toward Bolinas Road.
3. Construct infill walls between each pair of columns at each of the three bridge bents in the creek as follows:
    a. A dewatering plan that protects aquatic resources would be required of the contractor, reviewed and implemented. Where needed, the flow would be diverted around the work area by building a cofferdam upstream of the location and bypassing flowing water through a diversion pipe, keeping turbidity to a minimum. Best Management Practices (BMPs) would be implemented to avoid the migration of the sediments or contaminants into the water flow areas or drainage systems.
    b. The soils excavated at the bridge supports (Bents 2-4), and used for backfill later on, would be lifted and stored above at the project site, likely on Wessen Lane, and not allowed to remain on the creek bed. Ground water intrusion into the work area would be pumped out into special containers, filtered and placed back in the creek. Bent excavations around the columns to cast infill walls between them would differ at each of the three locations, as follows:
        i. For Bent 4, excavate a trench to the top of the exiting footings with approximate dimensions of 16’ (length) by 6‘(width) by 5’ (depth below the general creek bed). This trench would need to be fully shored on all four sides. The alternative to full shoring would be to maintain shoring facing Abutment 5 side only and lay back the other three excavated sides from the bottom up at ½:1 (horizontal to vertical) slope. In this case, the total footprint of the excavation at Bent 4 would be approximately 8’ wide by 23’ at the top. The choice of shoring vs. sloped sidewalls would be the Contractor’s, so one may count on the larger excavation footprint.
        ii. Each of Bent 2 and 3 would have riprap embedded around them

below surface, requiring a different excavation scheme. At Bent 2, the fully shored excavated footprint would be approximately 30' by 10' and its bottom would be approximately 5' below the creek bed. Not fully shored but with the side facing Abutment 1 shored, the excavation area would be approximately 35' x 15', which should be the footprint assumed since it is larger.

iii. At Bent 3, the fully shored excavation would be approximately 34' by 10' and 5' feet deep below the creek bed level. The fully unshored excavation, allowed at this bent, would be approximately 40' by 15', which again may be the exposed footprint to count on. At each of Bent 2 and Bent 3 the backfill would start with a 2.5-foot thick layer of half-ton rock at the bottom and all the way to the excavation lines, and finished to the top with native materials excavated originally and stored on Wessen Lane.

c. Drill holes in the sides of each pair of the columns facing one another within the bent. The holes would be spread out from the footings to the tops of the columns at a certain spacing. Epoxy steel rebar dowels in the holes and tie horizontal bars to the dowels spanning the space between the pair of columns at each bent. Tie vertical bars to the horizontal ones, create a "cage," place forms on each side of the cage and pour a concrete infill wall between each pair of columns from the top of the footings to the bottom of the bent cap beam. No discharge into the creek or contact between the ground water and concrete would be allowed. This transforms the 2-column bents to walls. The walls would be recessed since they are 1.5 feet thick while the existing columns are 2 feet wide. Once the infill wall concrete has cured and the forms are removed, backfill the remaining space in the trench at Bents 2 and 3 with a 2 ½-foot layer of rock riprap at the base, topped with a 2 ½-foot layer of the native soils left over from excavation work, up to the current surface of the creek bed. At Bent 4 the trench would be backfilled with soil from the bottom all the way to the creek bed. This retrofit would address the seismic brittleness of the cap beams and the columns when the structure moves sideways during the MCE.

d. At each bent, drill horizontal holes into the vertical superstructure diaphragms that connect the ends of the girders and sit atop the bent cap beams. Drill horizontal holes through the vertical faces of the bent cap beam as well. Place steel restrainer cables through both sets of drilled holes, wrap them around the cap beam and anchor the ends of the cables against the cap beam. This would tie the super- and substructure together and prevent the unseating of the former during the MCE.

e. New concrete stoppers would be attached to the face of each bent cap with epoxied into drilled holes, reinforced with steel rebars. This would not only stop the superstructure from sliding sideways (transversely) on the bent caps, but also act as a belt-and-suspender system in conjunction with the cable restrainers to limit the longitudinal movements of the girders and prevent their unseating.

4. Repair the concrete spalls on the underside of the bridge deck slab, the girders, the columns and the bent cap beams. In many of such spots the concrete has either spalled off or cracked and flaked, leaving the reinforcement exposed and rusted. The repairs entail removing the unsound concrete at these locations,

cleaning the rust on the reinforcement and covering the exposed area with special grout. This work would be primarily done on scaffolding and from lifts placed on the creek bed. Grout or concrete used for this operation would be contained and prevented from contact with the creek bed or water flow.

5. At each of the two abutment locations, excavate the approach roadways three feet deep and for a distance of 20 feet away from the ends of the bridge, with a width matching the bridge width. Place formwork in each excavated area to create a 4-cell "waffle" configuration with an overall shape of a parallelogram once the concrete is poured. Backfill the spaces within the waffle structure with soil, tamp the soil to 95% relative compaction and anchor the ends of the bridge to the slab with cables or other hardware before topping the waffle with a 9"-thick slab to serve as the riding surface. This waffle slab configuration would act as an anchor system to keep both the transverse and longitudinal seismic movements of the bridge and its abutments in check.

   An existing 6" waterline at the east abutment, and possibly a 4" PVC waterline at the west abutment, may interfere with these waffle slabs. In this case, these utilities would be relocated by Marin Municipal Water District (MMWD). Also, a 12"-diameter corrugated metal pipe (CMP) storm drain pipe, crossing Creek Road and daylighting at the south creek bank slightly downstream of the bridge, interferes with the south abutment's waffle slab and would be redirected around the slab. This would take place by abandoning the current pipe, excavating a sloped trench in the street and the adjacent creek bank and placing a new length of 12" CMP below the surface to daylight at the current location. The trench would be covered back up and the street pavement restored. Where the existing pipe daylights currently, the creek bank has been eroded. A 6' wide by approximately 20' long by 2' deep course of riprap would be placed flush with the surface of the creek bank just below where the flows exits the pipe in order to stop and prevent further bank erosion.

6. Remove the asphalt on the bridge deck's travel surface using a special grinding machine, clean the deck, patch the unsound concrete spots and seal the deck with methacrylate to fill all the cracks. Replace the expansion joint seals at the three existing bridge deck joints at the bents.

This bridge has more than adequate waterway opening for the design floods. The above construction work may reduce the current bridge opening slightly but would not result in measureable water surface elevation rise up- or downstream of the bridge.

The footprint of the bridge and approach roadways would not change in the process of seismic retrofit and no new right-of-way for this work would be needed. However, the bridge currently appears to occupy a narrow strip of land from an adjacent property on the upstream side. The existing easement documents, if any, for this piece of property would be reviewed and, if needed, a new easement agreement would be drawn up and executed.

Upon the completion of the work in the creek, plant restoration and mitigation work would be implemented. Vegetation disturbed by or removed for construction would be replaced. The approach roadways pavement excavated for waffle slab construction would be tidied up and restriped and the road would be opened for travel.

Chapter 2 – Study Methods

The Town's consultants Micki Kelly, PWS, plant ecologist of Kelly Biological Consulting and WRA fish and wildlife biologists Dan Chase, Nick Brinton and Patricia Valcarcel conducted biological resources studies in the Spring/Summer of 2015 including a biological resources assessment, special-status plant surveys, and a delineation of Section 404 jurisdictional areas within the Creek Road Bridge Seismic Retrofit Project Biological Study Area (BSA) in the Town of Fairfax, Marin County, California. The BSA was examined on foot to determine (1) vegetation communities present, (2) if existing conditions provide suitable habitat for any special-status plant or wildlife species that have a potential to occur within the vicinity of the BSA, and (3) the presence of potential jurisdictional wetlands and "other waters" within the BSA. The BSA and impact areas are shown in Figures 3a and 3b. The special-status species that are known to occur in the vicinity of the Biological Study Area are listed in Table 1 and mapped in Figures 4 and 5. The regulatory framework under which the assessment was conducted and the methods used to conduct the assessment are described in the following section.

Regulatory Requirements

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 provides a framework which federal agencies must follow in evaluating environmental impacts of their actions. Actions by federal agencies must "use all practicable means and measures" to avoid or lessen impacts to the environment. In 2007, formal guidance for the continuation of a pilot program was issued which allows Caltrans to assume all of the Federal Highway Administration (FHWA) environmental responsibilities under NEPA and other environmental laws (NEPA Delegation). This delegation authority is limited to highway projects, including Local Assistance Federal Aid projects, and specific projects within the State or a programmatic delegation. Therefore, Caltrans must ensure joint projects with FHWA or projects funded with Federal Aid are in compliance with NEPA.

WETLAND AND WATERS

Section 10 of Rivers and Harbors Act of 1899

The Rivers and Harbors Act requires permits in navigable waters of the U.S. for all structures such as riprap and activities such as dredging. The term navigable waters of the United States and all other terms relating to the geographic scope of jurisdiction are defined at 33 CFR part 329. Generally, they are those waters of the United States that are subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or are presently used, or have been used in the past, or may be susceptible to use to transport interstate or foreign commerce. The United States Army Corps of Engineers (USACE) grants or denies permits based on the effects on navigation. San Anselmo creek is a tributary to Corte Madera Creek, which is only considered navigable below the College of Marin, approximately 4 miles downstream of the site (http://www.spn.usace.army.mil). Therefore this creek is not considered a navigable water subject to the Rivers and Harbors Act.

Clean Water Act (CWA)

The CWA provides guidance for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters. Section 404 identifies the USACE jurisdiction over fill materials in essentially all water bodies, including wetlands. All federal agencies are required to avoid impacts to wetlands whenever there is a practicable alternative. Section 404 established a permit program administered by USACE regulating the discharge of dredged or fill material into Waters of the US (including wetlands).

Section 401of the CWA requires that an applicant for a federal license or permit that allows activities resulting in a discharge to Waters of the U.S., obtain a state certification that the discharge complies with other provisions of CWA. The Regional Water Quality Boards (RWQCB) administers the certification program in California. The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Executive Order 11990 – Protection of Wetlands

This order established a national policy to avoid adverse impacts to wetlands whenever there is a practicable alternative. The U. S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts to wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific Wetlands Only Practicable Alternative Finding. An additional requirement is to provide early public involvement in projects affecting wetlands. FHWA provides technical assistance (Technical Advisory 6640.8A) and reviews environmental documents for compliance.

California Porter-Cologne Water Quality Control Act

This regulatory law is becoming more prominent on projects involving impacts to isolated Waters of the State (non-404/401 waters). The RWQCB is increasingly requiring Waste Discharge Requirement (WDR) permits for impacts to Waters of the State.

Streams, Lakes, and Riparian Habitat in California

Streams and lakes, as habitat for fish and wildlife species, are subject to the jurisdiction of California Department of Fish and Wildlife (CDFW) under Sections 1600-1616 of California Fish and Game Code. Alterations to, or work within or adjacent to streambeds or lakes generally require a 1600 series Lake and Streambed Alteration Agreement. The term “stream”, which includes creeks and rivers, is defined in the California Code of Regulations (CCR) as “a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life [including] watercourses having a surface or subsurface flow that supports or has supported riparian vegetation” (14 CCR 1.72). In addition, the term “stream” can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife (CDFG 1994). “Riparian” is defined as “on, or pertaining to, the banks of a stream.” Riparian vegetation is defined as “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself” (CDFG 1994). Removal of riparian vegetation also requires a Lake and Streambed Alteration Agreement from CDFW.

INVASIVE SPECIES

Executive Order 13112 – Invasive Species

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council (Cal-IPC 2015) to define the invasive plants that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project. Under the EO, federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

PROTECTED SPECIES

Special-Status Species

Special-status species include those plants and wildlife species that have been formally listed, are proposed as endangered or threatened, or are candidates for such listing under the federal Endangered Species Act or California Endangered Species Act. These acts afford protection to both listed and proposed species. In addition, California Department of Fish and Wildlife Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are all considered special-status species. Although CDFW Species of Special Concern generally have no special legal status, they are given special consideration under the California Environmental Quality Act (CEQA). In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, or young is illegal. Plant species on the California Native Plant Society (CNPS) Rare and Endangered Plant Inventory with California Rare Plant Rank of 1 or 2 are also considered special-status plant species and must be considered under CEQA. Rank 3 and Rank 4 species are afforded little or no protection under CEQA.

Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended (16 USC 1531 et seq.), was enacted to provide a means to identify and protect endangered and threatened species. Under Section 9 of the ESA, it is unlawful to take any listed species. “Take” is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting a listed species. “Harass” is defined as an intentional or negligent act or omission, which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, or sheltering. “Harm” is defined as an act which actually kills or injures fish or wildlife and may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing

essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Actions that may result in "take" of a federal-listed species are subject to USFWS or National Marine Fisheries Service (NMFS) permit issuance and monitoring. Section 7 of ESA requires federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat for such species. Any action authorized, funded, or carried out by a federal agency or designated proxy (e.g., Caltrans) which has potential to affect listed species requires consultation with the USFWS or the NMFS under Section 7 of the ESA.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

California Endangered Species Act

CDFW is responsible for administering California Endangered Species Act (CESA, CDFG Code §§2050, et seq.), which prohibits take of species that have been listed, or are considered for listing (candidate species) as threatened or endangered species within the State of California. CESA allows for incidental take of state listed species through issuance of an Incidental Take Permit, or through a Consistency Determination in coordination with a Biological Opinion issued by the USFWS (CDFW Code Section 2081). In contrast with federal law, the definition of "take" under CESA involves actual harm to one or more members of a listed species and does not extend to modification of habitat not involving direct take.

Migratory Bird Treaty Act

This treaty with Canada, Mexico and Japan makes it unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, or kill migratory birds. The law applies to the removal of nests (such as swallow nests on bridges) occupied by migratory birds during the breeding season. California Fish and Game Code (Sec 3500) also prohibits the destruction of any nest, egg, or nestling.

Other Sensitive Biological Communities

Other sensitive biological communities not discussed above include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by the CDFW. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB; CDFW 2016). Sensitive plant communities are also identified by CDFW. CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2010) methodology, with those alliances ranked globally (G) or statewide (S) as 1 through 3 considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, or regulations or those identified by the CDFW or USFWS must be considered and

evaluated under CEQA (CCR Title 14, Div. 6, Chap. 3, Appendix G). Specific habitats may also be identified as sensitive in city or county general plans or ordinances.

LOCAL POLICIES AND ORDINANCES

Tree Protection Ordinance

In 1973, the Town of Fairfax approved Ordinance No. 387 for trees. The purpose of the ordinance is to preserve the wide variety of local native trees and to protect the benefits they provide the citizens. Chapter 8.36.020 of the Town Code defines "altering" and "tree." A Tree Permit is required for removal or significant trimming of any tree, which has a circumference of 24 inches or more measured at 24 inches above the ground. In effect, this is a little less than an 8-inch diameter tree trunk.

Studies Required

The Town's consultants, Kelly Biological Consulting and WRA conducted field studies in the entire BSA to determine the presence of wetlands and "other waters", and to evaluate the presence or potential presence of special-status species and sensitive habitats. Methods used during the site visits to make determinations for this NES are described below.

Special-Status Species

Prior to the field site visits to the BSA, the following sources were reviewed to determine which special-status plant and wildlife species have been documented to occur in the vicinity of the BSA:

- California Natural Diversity Database (CNDDB) records for the Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, San Quentin U.S. Geological Service 7.5' Quadrangles (CDFW 2016)

- USFWS quadrangle and county species lists for the Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, San Quentin and Marin County U.S. Geological Service 7.5' Quadrangles (USFWS 2016)

- CNPS Inventory of Rare, Threatened, and Endangered Plants of California records for the Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, San Quentin U.S. Geological Service 7.5' Quadrangles (CNPS 2015)

- CDFG publication "California's Wildlife, Volumes I-III" (Zeiner et al. 1990)

- CDFG publication "Amphibians and Reptile Species of Special Concern in California" (Jennings 1994)

- A Field Guide to Western Reptiles and Amphibians (Stebbins 2003)

- University of California at Davis, Center for Watershed Sciences. Pisces: California Fish Data and Management Software (2015)

- NMFS Essential Fish Habitat Maps of California (2007)

- The Marin Breeding Bird Atlas (Shuford 1993)

Special-Status Species. During the March-May 2015 site visits, the Town's consultant, Kelly Biological Consulting completed floristic surveys for special-status plant species with flowering periods that overlapped with the timing of the visits. All habitats with potential to support special-status plant species were traversed on foot, and all plant species observed and identifiable were recorded. For special-status wildlife species, WRA biologists completed a survey to determine the potential for the BSA to support special-status species, but the studies did not constitute protocol level surveys. Habitat conditions observed in the BSA during the site visits were used to evaluate the potential for presence of special-status species based on these literature searches and the professional expertise of the investigating biologists. Table 1 presents the evaluation of habitat potential for each special-status plant and wildlife species documented to occur in the vicinity of the BSA based on the literature database search. A list of all plant and wildlife species observed during the site visit is provided in Appendix A. The USFWS official listing of special-status species with a potential to occur in the proposed project vicinity is provided in Appendix B.

Section 404 "Waters of the U.S." During the site visit, the BSA was evaluated for the presence of indicators of wetlands and "other waters". Section 328.3 of the Federal Code of Regulations defines wetlands as:

> *"Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*" EPA, 40 CFR 230.3 and CE, 33 CFR 328.3 (b)

The methods used to delineate potential jurisdictional wetlands and waters are based on the *U.S. Army Corps of Engineers Wetlands Delineation Manual* ("Corps Manual"; Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* ("Arid West Supplement"; USACE 2008). The routine method for wetland delineation described in the Corps Manual was used to identify areas potentially subject to Corps Section 404 jurisdiction within the BSA.

The BSA was evaluated for the presence or absence of indicators of the three wetland parameters described in the Corps Manual and Arid West Supplement. The three parameters are the presence of: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the Corps Manual, for areas not considered "problem areas" or "atypical situations":

> *"... [E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination."*

This study also evaluated the presence of unvegetated "other waters" potentially subject to Corps jurisdiction under Section 404 of the Clean Water Act. Besides wetlands, other areas subject to Corps jurisdiction include lakes, rivers and streams in addition to all areas below the high tide line (HTL) in areas subject to tidal influence. No tidally influenced areas are present in the BSA. Jurisdiction in non-tidal areas extends to the ordinary high water (OHW) mark defined as:

> "*...that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impresses on the bank, shelving, changes in the characteristics of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*" Federal Register Vol. 51, No. 219, Part 328.3 (e). November 13, 1986.

Identification of the ordinary high water mark at this site followed the Corps Regulatory Guidance Letter No. 05-05, *Ordinary High Water Mark Identification* (Corps 2005), which provides a list of indicators, such as shelving, natural lines impressed on the bank, wrack lines, scour, and sediment deposition. These indicators were used to map the location of the ordinary high water mark for "other waters" in the BSA.

Vegetation Communities and Sensitive Habitats. Vegetation communities present in the BSA were classified based on existing plant community descriptions described in *A Manual of California Vegetation, 2nd Edition* (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). However, in some cases it was necessary to identify variants of community types or to describe non-vegetated areas that are not described in the literature.

Biological communities were classified as sensitive or non-sensitive as defined by CEQA. Sensitive plant communities include habitats that fulfill special functions or have special values. Natural communities considered sensitive are those identified in local or regional plans, policies, regulations, or by CDFW. CDFW ranks sensitive communities as 'threatened' or 'very threatened' and keeps records of their occurrences in its CNDDB. Also, vegetation alliances are ranked 1 through 5 (Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). Alliances ranked globally (G) or statewide (S) as 1 through 3 are considered sensitive. Impacts to sensitive natural communities identified in local or regional plans, policies, regulations, or by CDFW or USFWS must be considered and evaluated under CEQA.

Personnel and Survey Dates

The Town's consultant, Micki Kelly, Certified Professional Wetland Scientist and plant ecologist with 25 years of experience, conducted the wetland delineation on May 22, 2015 and special-status plant surveys on March 16, April 1 & 17, and May 22, 2015. The Town's consultant, WRA biologists Patricia Valcarcel (wildlife biologist) and Nicholas Brinton (fisheries biologist) conducted the biological resource site visit on April 1, and May 22, 2015. Their qualifications are provided in Appendix C.

Agency Coordination and Professional Contacts

Pre-project Design Phase Geotech Bore. A one day geotech bore (4-inch diameter) was required as part of the initial design work in 2013-4. Permit applications were submitted to the regulatory agencies (Roberta Morganstern, USACE; Xavier Fernandez, RWQCB; Timothy S. Dodson, CDFW; Gary Stern, NMFS). On December 13, 2013, CDFW issued a letter saying that no Streambed Alteration Agreement was needed (file number 1600-2013-0446). On February 4, 2014, NMFS (NOAA) issued a concurrence letter for the work (file number WCR-2013-145). On February 14, 2014, the USACE authorized the work (file number 2014-02-14-093433). The RWQCB's approach was to let the 45-day window for responding expire, resulting in defacto authorization. The small geotech drilling hole was completed and backfilled on March 14, 2014. On May 16, 2014 a completion memo was submitted to the above agencies.

Current Phase. In June 2015, the USACE, RWQCB, and CDFW (the same individuals identified above) were sent an email asking if compensatory mitigation would be required for the permanent impacts to “other waters”. The RWQCB and CDFW responded that it would. There has been no additional agency coordination or professional contacts.

Limitations That May Influence Results

Most of the fieldwork was conducted in the spring of 2015. The region was in the fourth year of a drought. The creek and adjacent low areas may have higher surface water (or shallow ground water) levels and generally more mesic conditions during normal rainfall years. The site visits were conducted during daylight hours and consisted of an assessment of likely habitats for special-status plants and wildlife; it did not conform to specific USFWS or NMFS protocols for any species. No detailed fish studies were completed to identify and enumerate fish species present. Data and documents from previous studies in the area were relied upon to evaluate potential presence of fish species.

Chapter 3 – Results: Environmental Setting

This section describes the region in which the proposed project would occur. It is intended to provide description of the setting to explain context and the level of intensity of impacts. It includes a brief description of the area's topography, soils, habitat, watercourses, and level of human or natural disturbance.

Existing Biological and Physical Conditions

BIOLOGICAL STUDY AREA

The BSA is located on and around the Creek Road Bridge over San Anselmo Creek in the Town of Fairfax, Marin County, California. The BSA covers all areas where direct and indirect impacts would occur such as ground-disturbance, construction staging, access roads, and noise disturbances. The BSA is extended beyond areas of the proposed project footprint or direct impacts to ensure that key biological issues are addressed. Creek Road is a local road in a developed area. The adjacent land use is residential (single family homes). The BSA extends up and downstream from the bridge along the stream corridor covering the only natural area.

Site elevations range from approximately 100 to 150 feet NAVD88. The bridge is located on the San Rafael USGS 7.5-minute quadrangle map at latitude W37.585932, longitude N122.352612.

PHYSICAL CONDITIONS

Topography

Within the BSA the creek bends to the east forming an accretion area on the southeast side. Near the downstream (northeast) edge of the BSA the creek bends to the north. The channel is approximately 20 feet below the top of bank. The southeastern and north/northwestern banks are relatively steep. During the New Year's Eve flood of 2005, the bridge's west abutment experienced a major washout. The abutment was repaired and protected with rock riprap that extends along a portion of the northern bank. The southwestern bank is gently sloped. Adjacent to the top of bank, lands to the west are relatively flat. A ridge lies to the east.

Hydrology

The principal natural hydrological sources for the BSA are creek flows, direct precipitation and surface run-off from adjacent lands. San Anselmo Creek flows though the BSA towards the north/northeast. Just north of the BSA, Deer Creek joins San Anselmo Creek. Roughly one quarter of a mile to the north, it joins Fairfax Creek and turns east, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. In wet years, the creek at this location is perennial. At the time of the fieldwork, in a drought year, the flows were low.

Soils

The soils that occur in the BSA are Xerorthents-Urban land complex (0 to 9 percent slopes), which is on the western half of the site and Tocaloma-McMullin-Urban land complex (30 to 50 percent slopes), on the eastern half of the site (USDA NRCS 2015). The Tocaloma-McMullin-Urban land complex is a fine-loamy, mixed, mesic Typic

Haploxeroll. Its drainage class is well drained. Soil taxonomy information is not available on the Xerorthents-Urban land complex.

BIOLOGICAL CONDITIONS IN THE BSA

Riparian Woodland

The BSA consists of a mature closed canopy Riparian Woodland similar to California Bay (*Umbellularia Californica*) Forest Alliance (Sawyer, J. O., T. Keeler-Wolf, and J. Evens. 2009) (Figure 3a). Overstory species include native tree species such as big-leaf maple (*Acer macrophyllum*), California bay, and California walnut (*Juglans californica*). The understory is comprised mainly of California blackberry *(Rubus ursinus)*, Himalayan blackberry (*Rubus armeniacus*), English ivy (*Hedera helix*), and various grasses including panic veldtgrass (*Ehrharta erecta*) and wall barley (*Hordeum murinum* ssp. *murinum*). Several small diameter white alders (*Alnus rhombifolia*), big-leaf maples, a young buckeye (*Aesculus californica*), and some sparse arroyo willow (*Salix lasiolepis*) (planted during the 2005 bank work) make up the shrub and tree part of the understory.

Ruderal Disturbed/Developed

The Ruderal Disturbed/Developed portions of the BSA include the roadsides, landscaping, gravel and bare dirt areas, as well as paved areas and structures. Within the BSA, this plant community is predominately non-native herbaceous species commonly found in the region, such as sorrel (*Oxalis incarnata* and *O. pes-carpe*), narrow-leaved vetch (*Vicia sativa* ssp. *nigra*), various clovers (*Trifolium* spp.), wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), and Canary reed-grass (*Phalaris canariensis*). The roadside vegetation includes a small stand of coyote brush (*Baccharis pilularis*) on the northern top of bank.

Perennial Stream (Comprised of “Other Waters” and Wetlands)

San Anselmo Creek is a perennial creek with flows that vary with the rainfall patterns of a given season. The watershed that supports it is a local area, primarily the western part of the Town of Fairfax and adjacent open space lands. Flows within the creek at the time of the site visit in the spring of 2015 were low; only a few inches of water remained within a low flow channel that narrowed to several feet in places, though several deeper pools persist year-round in the BSA. Wrack observed at the edge of the creek bed was used as an indication of OHW mark. Creek substrate consists of small gravel to larger cobble. The channel width at the OHW mark was used to determine the “other waters” boundary shown on Figure 3a. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior.

A 7-foot by 3-foot wetland area occurs on a gravel bar within the creek bed. The dominant vegetation found here includes hoita (*Hoita macrostachya*) (OBL), fig (*Ficus carica*) (FACU), alder (*Alnus rhombifolia)* (FACW), and Himalayan (aka Armenian) blackberry (*Rubus armeniacus*) (FACU). The soils are silty sand with 1-3 inch cobble and a chroma of 10YR3/2.

Unvegetated Bank

The banks under the existing bridge are generally unvegetated. The western bank consists of rock riprap. The eastern bank is made up of exposed bedrock and bare dirt.

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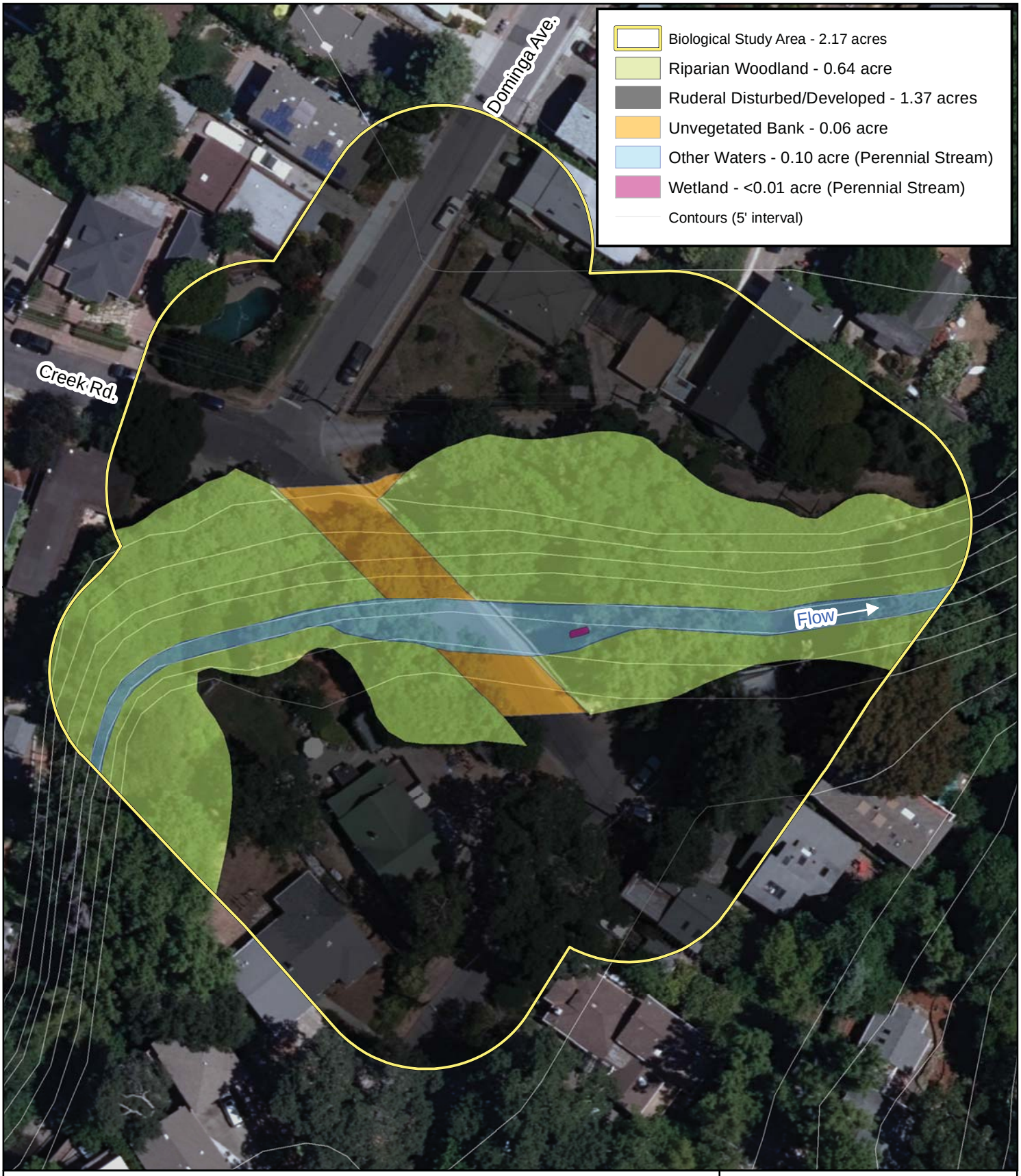


Figure 3a. Biological communities within the Biological Study Area

N
W E
S

0 25 50 100
Feet

Creek Road Bridge NES
Marin County, California

wra
ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 11/13/2015
Map Prepared By: dchan
Base Source: Marin County (2014)
Data Source(s): WRA

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Creek Road\NES\Fig3a_VegComms_20151110.mxd

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Wildlife Species in the BSA

Wildlife species common to the vicinity of the BSA include western scrub jay (*Aphelocoma californica*), acorn woodpecker (*Melanerpes formicivorus*) green heron (*Butorides virescens*), American crow (*Corvus brachyrhynchos*), and fox squirrel (*Sciurus niger*). The BSA is located above two partial fish passage barriers at Saunders Avenue and at Pastori Avenue. San Anselmo Creek is still considered anadromous because the barriers only deter passage during low flow portions of the year. Central California Coastal (CCC) steelhead (*Oncorhynchus mykiss*) are considered present within the watershed.

INVASIVE SPECIES

Federal Highway Administration guidance issued August 10, 1999, states that the State's invasive species list, maintained by the California Invasive Species Council be used to define the invasive plants. The California Invasive Plant Council (Cal-IPC) Inventory and CDFA maintain lists of invasive plant species. Cal-IPC list categorizes plants as High, Moderate, or Limited, reflecting the level of each species' negative ecological impact in California. Cal-IPC defines High as "species that have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically." (Cal-IPC 2015). The species found in the BSA that are listed on the Cal-IPC list as High are English ivy (*Hedera helix*), French broom (*Genista monspessulana*), and Himalayan blackberry.

During construction the several French broom individuals in the BSA would be removed. The English ivy and Himalayan blackberry would be more difficult to eradicate given that they are common outside the BSA in nearby areas and upstream. The proposed project would remove individuals of both of these species in areas where the vegetation is disturbed by construction activities; and replace them with California blackberry or other appropriate native species.

New Zealand mud snail (NZMS; *Potamopyrgus antipodarum*) are documented within San Anselmo Creek. Construction equipment such as pumps, tanks, or heavy equipment which operates within an infested aquatic environment is at risk for spreading NZMS. Snails survive in pooled water in pumps and tanks or in mud which remains attached to equipment. To prevent the spread of NZMS, all construction equipment would be thoroughly cleaned to remove all attached soil and all water within the compartments would be dried up. Pumps and tanks would be cleaned and must remain fully dried for 72 hours following cleaning before equipment may be used on another aquatic project. In addition, any measures required by the agencies will be implemented.

Regional Species and Habitats and Natural Communities of Concern

The species listed in the CDFW (2016), CNPS (2015), and USFWS (2016) records search results are discussed in Table 1. The printout of the USFWS list can be found in Appendix B. Figures 4 and 5 show the documented occurrences for special-status plant and wildlife species (respectively) in the vicinity of the BSA based on the CNDDB (CDFW 2016). A description of habitat requirements is provided for each special-status plant or wildlife species along with an evaluation of its potential to occur within the BSA. Potential for special-status species to occur in the BSA was determined according to the following criteria:

- Absent [A] - No habitat present and no further work needed.
- Habitat Present [HP] - Habitat is, or may be present. The species may be present.
- Present [P] - Species is present
- Critical Habitat [CH] – Proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is present.

Based on these results, it was determined that 76 special-status plant species and 101 special-status wildlife species have been documented from or have a range that occurs in the San Rafael, Bolinas, San Geronimo, Novato, Petaluma Point, San Quentin, San Francisco North, or Point Bonita 7.5-minute USGS quadrangles. Of these species, 31 special-status plant species and 13 special-status wildlife species have documented occurrences within 8 kilometers (5 miles) of the BSA.

Due to a lack of appropriate habitat elements (such as coastal salt marsh) and the presence of residential development in the surrounding landscape, it was determined that the BSA has the potential to support only 11 of the special-status plant species identified in Table 1. No special-status plants were observed in the BSA during the site assessments conducted for this report.

The BSA is designated as critical habitat for both CCC steelhead and Coho salmon (*O. kisutch*). Steelhead have been documented and is presumed present within this section of San Anselmo Creek (Brown and Moyle 1991). Coho salmon; however, is considered extirpated because they no longer spawn or occur within tributaries and waters of San Francisco Bay (NMFS 2012). The BSA is also listed as EFH for Coho salmon and Chinook salmon (*O. tshawytscha*); though neither species occurs in the watershed. In addition, based on habitat and conditions within the BSA and considering documented occurrences nearby, it was determined that the BSA has potential to support seven of the special-status wildlife species identified in Table 1.

The proposed project primarily involves short-term, temporary impacts and would not disrupt connectivity in the region. The creek channel would be restored to conditions similar to pre-project conditions which would allow for continued fish passage following the completion of work. Sensitive habitat within the BSA is limited to San Anselmo Creek which is a perennial waterway. San Anselmo Creek is subject to USACE, RWQCB, and the CDFW jurisdiction.

Table 1: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Birds					
tricolored blackbird	*Agelaius tricolor*	SC, BCC, SSC	(Nesting colony) highly colonial species, most numerous in Central Valley and vicinity. Largely endemic to California. Requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	A	The BSA does not contain any open waters such as ponds, lakes or marsh habitat that supports foraging or nesting by the colony. The blackberry shrubs located along the banks in the vicinity of the BSA are not sufficiently dense or large enough to support nesting by this species.
grasshopper sparrow	*Ammodramus savannarum*	SSC	Summer resident. Nests in open grassland habitats, generally with low- to moderate-height grasses and scattered shrubs. Nest typically placed on the ground and well-hidden. Secretive.	A	The BSA does not contain annual grassland that could support nesting or foraging by the species. Additionally the BSA is located within riparian woodland habitat which is not suitable for this species.
Bell's Sage Sparrow	*Amphispiza belli belli*	BCC, WL	(Nesting) Nests in chaparral dominated by dense stands of chamise. Found in coastal sage scrub in southern portions of range. Nests are typically located on the ground beneath a shrub or in a shrub 6 to 18 inches above ground. Territories about 50 yards apart.	A	The BSA is comprised of developed surfaces, riparian woodland, and a stream channel, it does not contain any chaparral or coastal sage scrub habitat. Additionally chamise, the preferred nesting habitat for this species is absent from the BSA.
golden eagle	*Aquila chrysaetos*	CFP, BCC, WL	Resident in rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also nests in large trees in open areas.	A	Areas within the BSA and immediately surrounding are low-density residential developments and comprised of riparian woodland which do not provide suitable nesting habitat for the species. The BSA also does not support habitat for the preferred prey species of golden eagle.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
great egret	*Ardea alba*	None	(Rookery) Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	A	Suitable rookery trees are absent from the BSA and immediate surrounds, however, this species may occasionally fly over the BSA.
great blue heron	*Ardea herodias*	None	(Rookery) Colonial nester in tall trees, cliffs, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	A	Suitable rookery trees are absent from the BSA and immediate surrounds, however, this species may occasionally fly over the BSA.
short-eared owl	*Asio flammeus*	SSC	(Nesting) Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. Lowland marshes, tule patches or tall grasslands that typically support nesting by the species do not occur in the BSA.
long-eared owl	*Asio otus*	SSC	Primarily a year-round resident. Inhabits riparian bottomlands to tall willows and cottonwoods; also, belts of live oak paralleling stream courses. Requires dense foliage cover within occupied tree stands, adjacent open land productive of mice for foraging, and the presence of old nests of other birds for nesting.	A	This species is a very rare breeder in Marin County. The only recorded occurrences of the species are near Bolinas and Drake's Bay, both locations are greater than 5 miles from the BSA (Shuford 1993). Areas within the BSA and immediately surrounding are low-density residential developments with constant levels of anthropogenic disturbance which make the area unsuitable for nesting by the species. Higher quality habitat is present in north-western Marin County.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
burrowing owl	*Athene cunicularia*	SSC, BCC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. The BSA does not contain short grasslands or other open areas containing burrows that could provide nesting or wintering habitat for this species.
oak titmouse	*Baeolophus inornatus*	BCC	Oak woodland and savannah, open broad-leaved evergreen forests containing oaks, and riparian woodlands. Associated with oak and pine-oak woodland and arborescent chaparral	P	Riparian woodland within and surrounding the BSA provides potential nest-trees and foraging habitat to support this species.
marbled murrelet	*Brachyramphus marmoratus*	FT, SE, WL	(Nesting) Feeds near shore; nests inland along the Pacific coast, from Eureka to Oregon border, and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands containing platform-like branches.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. Riparian forest surrounding the BSA is not old growth redwood which is required to provide the isolation and platform like structures required for nesting by the species.
Lawrence's goldfinch	*Carduelis lawrencei*	BCC	Resident to nomadic; inhabits oak woodlands, chaparral, riparian woodlands and other areas, often near water. Not known to breed in the vicinity of San Francisco Bay.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide suitable nesting habitat for the species. This species is a very rare breeder in Marin County and typically inhabits the dry southern portions of the county.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Vaux's swift	*Chaetura vauxi*	SSC	Summer resident, primarily in forested areas. Nests in tree cavities, favoring those with a large vertical extent. Also uses chimneys and other manmade substrates. Forages widely for aerial insects, often over or near rivers and lakes.	A	Trees surrounding the BSA are not adequate in size to provide suitable cavities that are required to support nesting by the species.
western snowy plover	*Charadrius alexandrinus nivosus*	FT, SSC, BCC	(Nesting) Federal listing applies only to the Pacific coastal population. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. Sandy beaches, salt flats or alkali lake flats that this species inhabits are absent from the BSA and immediate surrounds.
northern harrier	*Circus cyaneus*	SSC	(Nesting) Nests and forages in grassland habitats, usually in association with coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. Suitable mesic grasslands or marsh habitat are absent from the BSA and the immediate surrounding areas.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	FT, SE, BCC	Summer resident, breeding in dense riparian forests and jungles, typically with early successional vegetation present. Utilizes densely-foliaged deciduous trees and shrubs. Eats mostly caterpillars. Current breeding distribution within California very restricted.	A	Marin County is not within the documented breeding range of this species. Additionally, the extensive riparian woodland habitat that this species inhabits is absent from the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
olive-sided flycatcher	*Contopus cooperi*	SSC, BCC	Summer resident. Breeds in montane coniferous forests, as well as mixed forests along the coast. Often associated with edge habitats.	HP	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of habitats which do not provide nesting habitat for the species. The California bay dominated riparian habitat present within the BSA is not typically used for nesting, however, foraging may occur within the BSA.
black swift	*Cypseloides niger*	SSC, BCC	Summer resident with a fragmented breeding distribution; most occupied areas in California either montane or coastal. Breeds in small colonies on cliffs behind or adjacent to waterfalls, in deep canyons, and sea-bluffs above surf. Forages aerially over wide areas.	A	Marin County is not within the documented breeding range of this species. Additionally, the BSA does not contain cliffs or deep canyons capable of providing nesting habitat for this species.
snowy egret	*Egretta thula*	none	(Rookery) colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	A	Suitable rookery trees are absent from the BSA and immediate surrounds, however, this species may occasionally fly over the BSA.
white-tailed kite	*Elanus leucurus*	CFP	(Nesting) Year-long resident of open grasslands and agricultural areas. Preys on small diurnal mammals and occasional birds, insects, reptiles, and amphibians. Nests in tree-tops.	A	Areas within the BSA and immediately surrounding are low-density residential developments which largely comprised of riparian woodland and do not provide nesting habitat for the species. The BSA does not contain open areas such as agricultural fields, grasslands or marsh that are typically used by this species. Higher quality habitat is present in other portions of Marin County, including areas immediately south of the BSA. As a result, this species could occasionally be observed flying over the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
American peregrine falcon	*Falco peregrinus anatum*	FD, SD,CFP, BCC	Year-round resident and winter visitor in the region. Habitat variable, though usually associated with coasts, bays, marshes and other bodies of water. Nests on sheer, protected cliffs and also on manmade structures including buildings and bridges. Preys on birds, especially waterbirds. Forages widely.	A	High cliffs, and tall buildings typically used for nesting by this species are absent from the BSA and immediate surrounds. Large water-bodies which provide foraging habitat are absent from the BSA and immediate surrounds.
common loon	*Gavia immer*	SSC	Winter visitor; does not nest in the vicinity San Francisco Bay. Aquatic, generally found in large, deep water bodies with abundant fish.	A	Common loons do not nest in California. Furthermore, the BSA does not contain any open water habitat capable of supporting foraging by this species.
saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	SSC, BCC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	A	The BSA is not within the known breeding distribution of this species. Suitable salt marsh habitat which is required for nesting and foraging is absent from the BSA and immediate surrounds.
black oystercatcher	*Haematopus bachmani*	BCC	Resident on rocky shores of marine habitats along almost the entire California coast and adjacent islands. Breeds on undisturbed, rocky, open shores and cliffs.	A	The BSA is not within the known breeding distribution of this species. Rocky shoreline and marine habitats which support nesting and foraging by the species are absent from the BSA and immediate surrounds.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
bald eagle	*Haliaeetus leucocephalus*	FD, SE, CFP, BCC	Primarily a winter visitor in the region; small numbers are present year-round and breed. Favors areas near larger bodies of water with abundant fish: lakes and reservoirs, rivers, and the ocean. Nests in large, old-growth, or dominant live tree with open branchwork. Often roosts communally in winter.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. The forested portions of the BSA do not contain the tall open branch-work needed to support nesting. Additionally, suitable foraging habitat does not occur within 2 miles of the BSA.
Caspian tern	*Hydroprogne caspia*	BCC	Nests in small colonies inland and along the coast on sandy estuarine shores, levees, and salt ponds. Found in inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.	A	The BSA is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The BSA does not occur near marine environments to support foraging.
yellow-breasted chat	*Icteria virens*	SSC	Summer resident, utilizing riparian areas with an open canopy, very dense understory, and trees for song perches. Nests in thickets of willow, blackberry, and wild grape.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland with minimal understory which do not provide nesting habitat for the species. The BSA lacks the dense riparian understory that this species requires. Furthermore, it is not known to nest within 10 miles of the BSA. .

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
loggerhead shrike	*Lanius ludovicianus*	SSC, BCC	Primarily a year-round resident in open habitats including woodland, grassland, savannah and agricultural areas. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in a densely-foliaged shrub or tree.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. The BSA does not contain open areas such as agricultural fields, grasslands or marsh that are typically used by this species.
California black rail	*Laterallus jamaicensis coturniculus*	ST, CFP, BCC	Resident in marshes (saline to freshwater) with dense vegetation below four inches in height. Prefers larger, undisturbed marshes close to a major water source.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any marsh habitat that this species requires for nesting and foraging.
Samuel's song sparrow	*Melospiza melodia samuelis*	SSC, BCC	Resident of salt marshes along the north side of San Francisco and San Pablo Bays. Inhabits tidal sloughs in the *Salicornia* marshes; nests in *Grindelia* bordering slough channels.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any marsh habitat that this species requires for nesting and foraging.
long-billed curlew	*Numenius americanus*	BCC, WL	Winter visitor to large coastal estuaries, upland herbaceous areas, and agricultural lands. Within California, nests only in the northeastern portion of the state in wet meadow habitat.	A	Long-billed curlew does not nest in Marin County. The BSA lacks beach, agricultural or herbaceous upland habitat capable of supporting nesting by this species.
black-crowned night heron	*Nycticorax nycticorax*		(Rookery) colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	A	Suitable rookery trees are absent from the BSA and immediate surrounds, however, this species may occasionally fly over the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Bryant's savannah sparrow	*Passerculus sandwichensis alaudinus*	SSC	Year-round resident subspecies, associated with the coastal fog belt. Occupies upper tidally-influenced habitats and moist grasslands, often occurring where wetland communities merge into grassland. Nests in vegetation on or near the ground.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland which do not provide nesting habitat for the species. The BSA lacks the tidally influenced habitats or grasslands that this species requires.
American white pelican	*Pelecanus erythrorhynchos*	SSC	(Nesting colony) colonial nester on large interior lakes. Nests on large lakes, providing safe roosting and breeding places in the form of well-sequestered islets. Winter visitor to the San Francisco Bay Area.	A	American white pelican does not nest in Marin County. Additionally, suitable foraging habitat does not occur within 2 miles of the BSA.
California brown pelican	*Pelecanus occidentalis californicus*	FD, SD, CFP	(Nesting colony) colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators.	A	California brown pelican does not nest in Marin County. Additionally, suitable foraging habitat does not occur within 2 miles of the BSA.
short-tailed albatross	*Phoebastria albatrus*	FE, SSC	Highly pelagic; comes to land only when breeding. Nests on remote Pacific islands. A rare non-breeding visitor to the eastern Pacific.	A	Short-tailed albatross does not nest in Marin County. Additionally, suitable marine foraging habitat does not occur within 5 miles of the BSA.
Nuttall's woodpecker	*Picoides nuttallii*	BCC	Resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks.	P	Riparian woodland habitat within and surrounding the BSA may provide suitable nest-trees and foraging habitat which may support this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
purple martin	*Progne subis*	SSC	Summer resident. In northwestern California, typically breeds in coniferous forest and woodlands. Nest in tree cavities, usually high off the ground, and in the cavities of manmade structures (e.g. bridges, utility poles). Forages for aerial insects.	HP	Riparian woodland habitat within and surrounding the BSA may provide suitable nest-trees and foraging habitat which may support this species.
California clapper rail	*Rallus longirostris obsoletus*	FE, SE, CFP	Resident in tidal marshes of the San Francisco Bay Estuary. Requires tidal sloughs and mud flats for foraging, and dense vegetation for nesting. Associated with abundant growth of cordgrass and pickleweed. Largest populations in south San Francisco Bay.	A	The BSA is not within the known breeding distribution of this species. The BSA lacks any salt marsh habitat which this species requires for nesting and foraging.
bank swallow	*Riparia riparia*	ST	Migrant in riparian and other lowland habitats in western California. Colonial nester in riparian areas with vertical cliffs and bands with fine-textured or fine-textured sandy soils near streams, rivers, lakes or the ocean.	A	Bank swallow does not nest in Marin County. The BSA lacks any cliff habitat which this species requires for nesting. The species may pass through the BSA on migration.
Allen's hummingbird	*Selaphorus sasin*	BCC	Breeds along the California coastline in habitats including mixed evergreen, Douglas fir, redwood and Bishop pine forests, riparian woodlands, nonnative eucalyptus and planted cypress groves, and occasionally live oak woodlands and coastal scrub with at least a scattering of trees, such as on north-facing slopes	HP	Riparian woodland habitat within and surrounding the BSA may provide suitable nest-trees and foraging habitat which may support this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
rufous hummingbird	*Selasphorus rufus*	BCC	Spring migrant; does not breed in California. Favors habitats rich in nectar-producing flowers. Nests in berry tangles, shrubs, deciduous forests and conifers. Favors habitats rich in nectar-producing flowers.	A	The BSA is outside of the known breeding range for this species, but rufous hummingbird may be observed during migration seasons.
California least tern	*Sternula antillarum browni*	FE, SE, CFP	Colonial breeder on barren or sparsely vegetated, flat substrates near water. Breeding colonies in San Francisco Bay along estuarine shores and in abandoned salt ponds.	A	The BSA is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The BSA does not occur near marine environments to support foraging.
northern spotted owl	*Strix occidentalis caurina*	FT, SP, SSC	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. Prefers high, multistory canopy dominated by big trees, trees with cavities or broken tops, woody debris and space under canopy.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland habitats. Riparian woodland does not typically support the species or its preferred prey. This species has been recorded within 1 mile of the BSA, however observations are in areas of forest which are less developed and border expanses of undeveloped forest habitat.
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC	Migrant and local summer resident. Nests colonially in freshwater emergent wetlands with dense vegetation and deep water, often along borders of lakes or larger ponds. Forages primarily on large aquatic insects during the breeding period.	A	The BSA does not contain any open waters such as ponds, lakes or marsh habitat that supports foraging or nesting by the colony. The shrubs located along the banks in the vicinity of the BSA are not sufficiently dense or large enough to support nesting by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Mammals					
pallid bat	*Antrozous pallidus*	SSC, WBWG: High	Found in deserts, grasslands, shrublands, woodlands, and forests. Most common in open, forages along river channels. Roost sites include old ranch buildings, rocky outcrops and caves within sandstone outcroppings. Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	A	Areas within the BSA and immediately surrounding are low-density residential developments with no rock outcroppings or ranch type buildings to provide roosting sites. The bridge has no exposed cracks or seams and is regularly disturbed by vehicles and pedestrians, making the structure and the surrounding area unsuitable for the species.
Point Reyes mountain beaver	*Aplodontia rufa phaea*	SSC	The Point Reyes mountain beaver is only known to occur in western Marin County, almost entirely within Point Reyes National Seashore. It occurs on cool, moist, north-facing slopes in moderately dense coastal scrub. Burrows are typically constructed in dense thickets or in forest openings; and it feeds on coyote brush, sword fern, cow parsnip, black berries, poison oak, California nettle, and thistle.	A	The BSA is not within the known breeding distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and primarily comprised of riparian woodland habitats. The BSA does not contain any coastal scrub habitat which is required by the species.
Guadalupe fur seal	*Arctocephalus townsendi*	FT, ST, CFP	Breed on Isla de Guadalupe off the coast of Mexico, occasionally found on San Miguel, San Nicolas, and San Clemente islands. Prefers willow, nearshore island water with cool and sheltered rocky areas for haul-outs.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
sei whale	*Balaenoptera borealis*	FE	Inhabits oceans and adjoining seas, and prefers deep offshore waters. Avoids polar and tropical waters and semi-enclosed bodies of water. Migrates annually from cool and sub-polar waters in summer to winter in temperate and subtropical waters.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
blue whale	*Balaenoptera musculus*	FE	Lives in open oceans occasionally swimming in small groups but usually alone or in pairs. Often spend summers feeding in polar waters and migrate to equatorial regions during winter.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
finback (=fin) whale	*Balaenoptera physalus*	FE	Found in deep, offshore waters of open oceans, primarily in temperate to polar latitudes.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
ringtail (ring-tailed cat)	*Bassariscus astutus*	CFP	Is widely distributed throughout most of California, but absent from some portions of the Central Valley and northeastern California. The species is nocturnal, primarily carnivorous and is associated with a mixture of dry forest and shrubland in close association with rocky areas and riparian habitat, using hollow trees and cavities for shelter.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are primarily comprised of open understory riparian woodland habitats. Anthropogenic disturbances in the area and an absence of suitable trees to provide cavities make the species unlikely to occur.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Townsend's big-eared bat	*Corynorhinus townsendii*	SC (T), SSC, WBWG: High	This species is associated with a wide variety of habitats from deserts to mid-elevation mixed coniferous-deciduous forest. Females form maternity colonies in buildings, caves and mines and males roost singly or in small groups. Foraging occurs in open forest habitats where they glean moths from vegetation.	A	Areas within the BSA and immediately surrounding are low-density residential developments. Buildings in the area are maintained and do not provide suitable roosting habitat. Additionally, there are no caves, mines or suitable openings in the bridge structure to support roosting by the species within the BSA.
southern sea otter	*Enhydra lutris nereis*	FT, MMC: SSC, CFP	Nearshore marine environments from about Año Nuevo, San Mateo County to Point Sal, Santa Barbara County.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
right whale	*Eubalaena (=Balaena) glaciali*	FE	Primarily occurs in coastal or shelf waters. For much of the year, their distribution is strongly correlated to the distribution of their prey.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
steller (=northern) sealion	*Eumetopias jubatus*	FD, MMC: SSC	Breeds on Año Nuevo, San Miguel and Farallon islands, Point Saint George, and Sugarloaf.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
western red bat	*Lasiurus blossevillii*	SSC, WBWG High	This species is typically solitary, roosting primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (willows, cottonwoods, and sycamore).	A	Areas within the BSA and immediately surrounding are low-density residential developments. The riparian habitat within the BSA has been modified by previous projects. In addition the complexity of edge habitats required by the species are not present within the BSA. More suitable habitat with the required habitat components occurs approximately 0.25 miles southeast of the BSA. Due to the proximity to suitable habitat the species may fly over the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
hoary bat	*Lasiurus cinereus*	WBWG: Medium	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	A	Areas within the BSA and immediately surrounding are low-density residential developments. The BSA does not provide suitable open foraging habitat which is required by the species. Habitat mosaics with access to open grassland for foraging, suitable trees for roosting and water occur 0.25 miles southeast of the BSA.
San Pablo vole	*Microtus californicus sanpabloensis*	SSC	Saltmarshes of San Pablo Creek, on the south shore of San Pablo Bay. Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland habitats which do not provide nesting habitat for the species. Salt marshes that typically support nesting by the species do not occur within or adjacent to the BSA.
fringed myotis	*Myotis thysanodes*	WBWG High	Associated with a wide variety of habitats including mixed coniferous-deciduous forest and redwoods/sequoia groves. Buildings, mines, and large snags are important day and night roosts.	A	Areas within the BSA and immediately surrounding are low-density residential developments. In addition, there are no snags present in or adjacent to the BSA to provide roosting habitat. The bridge structure has no suitable seams, cracks or crevices that might provide roosting habitat for the species. Due to the proximity of the BSA to suitable habitat, the species may occasionally fly through or forage over the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
long-legged myotis	*Myotis volans*	WBWG High	Typically occupies mountainous or relatively rugged areas, dry coniferous forests, and sometimes oak or streamside woodlands, and deserts. Large hollow trees, rock crevices and buildings are important day roosts. Other roosts include caves, mines and buildings.	A	Areas within the BSA and immediately surrounding are low-density residential developments. The BSA does not contain mines abandoned buildings or snags for roosting. There are no suitable openings in the bridge structure such as seams or cracks to allow bats to roost. Due to the proximity of the BSA to more suitable habitat, the species may occasionally fly through or forage over the BSA.
sperm whale	*Physeter catodon (=macrocephalus)*	FE	Tend to inhabit areas with a water depth of 1968 feet (600 m) or more, and are uncommon in waters less than 984 feet (300 m) deep.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species.
salt-marsh harvest mouse	*Reithrodontomys raviventris*	FE, SE, CFP	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for flood escape.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are largely comprised of riparian woodland habitats. Salt marshes that are required to support nesting by the species do not occur in the BSA.
Suisun shrew	*Sorex ornatus sinuosus*	SSC	Tidal marshes of the northern shores of San Pablo and Suisun Bays. Require dense low-lying cover and driftweed and other litter above the mean high tide line for nesting and foraging.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are largely comprised of riparian woodland habitats. Marshes and tidal marine environments that are required to support nesting by the species do not occur in the BSA.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
salt-marsh wandering shrew	*Sorex vagrans halicoetes*	SSC	Confined to small remnant stands of salt marsh found around the southern arm of the San Francisco Bay in San Mateo, Santa Clara, Alameda and Contra Costa counties. Inhabits salt marshes that provide dense cover with driftwood and other debris.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are largely comprised of riparian woodland habitats. Salt marshes that are required to support nesting by the species do not occur in the BSA.
American badger	*Taxidea taxus*	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Requires friable soils and open, uncultivated ground. Preys on burrowing rodents.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are largely comprised of riparian woodland habitats. Friable soils which support the preferred prey for badgers and badger dens do not occur within the BSA.
Point Reyes jumping mouse	*Zapus trinotatus orarius*	SSC	Bunch grass marshes on the uplands of Point Reyes in areas safe from continuous inundation. Builds grassy nests on ground under vegetation, burrows in winter.	A	Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The BSA lacks marsh or grasslands that this species requires for nesting and foraging.
Amphibians and Reptiles					
California tiger salamander	*Ambystoma californiense*	FT, ST, SSC	Populations in Santa Barbara and Sonoma counties currently listed as endangered. Inhabits grassland, oak woodland, ruderal and seasonal pool habitats. Seasonal ponds and vernal pools for breeding and uplands for refugia.	A	Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The BSA does not support ponds or vernal habitats which are necessary for the species to support breeding. The BSA and immediate surrounds do not support grasslands or burrowing mammals which provide estivation habitat.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
loggerhead turtle	*Caretta caretta*	FT	Loggerheads occupy three different ecosystems during their lives: beaches, open water and nearshore coastal areas. Occurring throughout the temperate and tropical regions of the Pacific.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any beach or marine habitat which is required by this species.
green sea turtle	*Chelonia mydas*	FT (west coast popu-lations)	Found in fairly willow waters inside reefs, bays and inlets with marine grass and algae. Open beaches with a sloping platform and minimal disturbance for nesting.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any beach or marine habitat which is required by this species.
leatherback turtle	*Dermochelys coriacea*	FE, NMFS	Pelagic, living in the open ocean and occasionally entering the shallower water of bays and estuaries. Nesting beaches are sandy with a gradual slope and a deep water approach.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any beach or marine habitat which is required by this species.
western pond turtle	*Actinemys marmorata*	SSC	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nests sites may be found up to 0.5 kilometers from water.	A	There are no known occurrences of this species in the watershed or vicinity. The BSA is over 2 miles from the nearest documented occurrence in a different watershed.
olive (=Pacific) ridley sea turtle	*Lepidochelys olivacea*	FT	Primarily a pelagic sea turtle. Known to inhabit coastal areas, including bays and estuaries. In the Pacific, they occur from Southern California to Northern Chile.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any beach or marine habitat which is required by this species.
Alameda whipsnake	*Masticophis lateralis euryxanthus*	FT, ST	Inhabits chaparral and foothill-hardwood habitats in the eastern Bay Area. Prefers south-facing slopes and ravines with rock outcroppings where shrubs form a vegetative mosaic with oak trees and grasses.	A	The BSA is not within the known distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland. The BSA does not have grassland or chaparral habitat that supports the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
foothill yellow-legged frog	*Rana boylii*	SSC	Found in or near rocky streams in a variety of habitats. Prefers partly-shaded, willow streams and riffles with a rocky substrate; requires at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis. Feeds on both aquatic and terrestrial invertebrates.	A	Areas within the BSA and immediately surrounding are low-density residential developments. In addition, the species has not been documented within the watershed. The species has been documented in nearby watersheds within 5 miles of the BSA.
California red-legged frog	*Rana draytonii*	FT, SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of inundation for larval development. Must have access to estivation habitat.	A	Areas within the BSA and immediately surrounding are low-density residential developments. No ponds or lakes exist nearby that could provide adequate still water habitat to support breeding by the species.
Fishes					
green sturgeon	*Acipenser medirostris*	FT, SSC	Spawn in the Sacramento River and the Klamath River. Spawn at temperatures between 8-14 degrees C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine habitat which is required by this species for foraging.
tidewater goby	*Eucyclogobius newberryi*	FE, SSC	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in willow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any lagoon habitat which is required by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
delta smelt	*Hypomesus transpacificus*	FT, SE, RP	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun Bay, Carquinez Strait and San Pablo Bay.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any brackish water habitat which is required by this species.
Tomales roach	*Lavinia symmetricus* ssp. *symmetricus*	SSC	Habitat generalists. Tolerant of relatively high temperatures and low oxygen levels, however unable to tolerate very saline water. Tributaries to Tomales Bay.	A	The BSA is not within the known breeding distribution of this species.
Coho salmon - central California coast	*Oncorhynchus kisutch*	FE, SE	State listing is limited to Coho south of San Francisco Bay. Federal listing is limited to naturally spawning populations in streams between Humboldt County and Santa Cruz County. Spawn in coastal streams 4-14C. Prefer beds of loose, silt-free, coarse gravel and cover nearby.	HP, CH	The creek is designated as critical habitat for the species. However, the species is considered extirpated from the waters of San Francisco Bay (NMFS 2012).
steelhead - central California coast	*Oncorhynchus mykiss*	FT	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating downstream to the ocean.	P, CH	The creek is designated as critical habitat for the central California coastal DPS of this species. Though two barriers to anadromy exist downstream of the BSA, the species is considered present within the creek.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
steelhead - central valley	*Oncorhynchus mykiss irideus*	FT	The Central Valley DPS includes all naturally spawned populations (and progeny) in the Sacramento and San Joaquin Rivers and tributaries, excluding San Francisco and San Pablo bays and their tributaries.	A	The creek is designated as critical habitat for the central California coastal DPS steelhead. This DPS of steelhead only spawns within the Sacramento and San Joaquin Rivers but not within other tributaries of San Francisco Bay. Therefore, the BSA occurs outside of the known range of the species.
chinook salmon – Sacramento River winter-run	*Oncorhynchus tshawytscha*	FE, SE, RP	Occurs in the Sacramento River below Keswick Dam. Spawns in Sacramento River but not in tributary streams. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams.	A	The BSA is not within the known breeding distribution of this species. This species is only known to spawn in the Sacramento River. Additionally, The BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
chinook salmon - Central Valley spring-run	*Oncorhynchus tshawytscha*	FT,ST	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams.	A	The BSA is not within the known breeding distribution of this species. This species is only known to spawn in the Sacramento River. Additionally, The BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
chinook salmon - California coastal ESU	*Oncorhynchus tshawytscha*	FT, RP	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sacramento splittail	*Pogonichthys macrolepidotus*	SSC	Endemic to California's Central Valley and the Sacramento-San Joaquin Delta. Primarily freshwater fish, but are tolerant of moderate salinity. Spawn on submerged vegetation in temporarily flooded upland and riparian habitat.	A	The BSA is not within the known breeding distribution of this species. The BSA does not contain any flooded upland or slow slough like habitat which this species requires for spawning.
longfin smelt	*Spirinchus thaleichthys*	FC, ST, SSC	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
eulachon	*Thaleichthys pacificus*	FT, SSC	Occur in nearshore ocean waters and to 1,000 feet (300 m) in depth, except for the brief spawning runs into their natal (birth) streams. Ranges from northern California to southwest Alaska and southeastern Bering Sea.	A	The BSA is not within the known breeding distribution of this species. Additionally, The BSA lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
Invertebrates					
Conservancy fairy shrimp	*Branchinecta conservatio*	FE, RP, SSI	Endemic to the grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools located in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	A	The BSA is not within the known range of this species. The BSA does not contain any grassland or vernal pool features that can support the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Tomales isopod	*Caecidotea tomalensis*	SSI	Inhabits localized fresh-water ponds or streams with still or near-still water in several San Francisco Bay Area counties.	A	Areas within the BSA and immediately surrounding are low-density residential developments and largely comprised of riparian woodland habitats. The creek which flows through the BSA is a flowing creek which does not provide the still water or pond habitat required by the species.
Marin blind harvestman	*Calicina diminua*	SSI	Occurs in mesic habitats, but are absent from situations where soils are saturated or periodically inundated. Most species occur under medium to large undisturbed rocks that are in contact with the soil.	A	Areas within the BSA and immediately surrounding are low-density residential developments which are largely comprised of riparian woodland habitats. The rock rip rap is a recent addition and is primarily dry throughout the year.
San Bruno elfin butterfly	*Callophrys mossii bayensis*	FE, SSI	Inhabits coastal mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium.*	A	The BSA is not within the known breeding distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The BSA contains no grassland that may support the host plants required by the species.
monarch butterfly	*Danaus plexippus*	SSI	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, Monterey cypress), with nectar and water sources nearby.	A	Roost sites for monarchs in the areas surrounding the BSA are primarily in groves along the coast. No groves used as roost sites have been recorded within 7 miles of the BSA. Because of the locations of recorded groves to the east and west of the BSA, the species may migrate through the area in route to roost sites.
black abalone	*Haliotes cracherodii*	FE, SSI	Generally occur in areas of moderate to high surf in mid to low rocky intertidal areas.	A	The BSA is not within the known breeding distribution of this species. The BSA does not contain any intertidal shores or marine environments which are required to support the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
white abalone	*Haliotis sorenseni*	FE, SSI	Rocky pinnacles and deep reefs in southern California; especially those off the Channel Islands. Live at depths from 80 to 200 feet.	A	The BSA is not within the known breeding distribution of this species. The BSA does not contain any intertidal shores or marine environments which are required to support the species.
Ricksecker's water scavenger beetle	*Hydrochara rickseckeri*	SSI	Aquatic; known only from pond habitats scattered around the San Francisco Bay area.	A	Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The creek within the BSA does not provide pond habitat which is required to support the species.
mission blue butterfly	*Icaricia icarioides missionensis*	FE, RP, SSI	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons, L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	A	The BSA is not within the known breeding distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The BSA does not contain grassland required to support the host plants of the species.
Callippe silverspot butterfly	*Speyeria callippe*	FE, SSI	Restricted to the northern coastal scrub of the San Francisco peninsula. Host plant is Viola pedunculata. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	A	The BSA is not within the known breeding distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The BSA does not contain grassland required to support the host plants of the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE, RP, SSI	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval food plant thought to be Viola adunca.	A	The BSA is not within the known breeding distribution of this species. Areas within the BSA and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The BSA does not contain grassland to support the host plants or foraging by the species.
California freshwater shrimp	*Syncaris pacifica*	FE, SE, RP, SSI	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Willow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	A	The BSA is not within the known breeding distribution of this species. Suitable habitat for the species is primarily found within northern Marin County along the border with Sonoma County. This species has not been documented in San Anselmo Creek.
Plants and Sensitive Natural Communities					
Sensitive Natural Communities					
Coastal Brackish Marsh, Coastal Terrace Prairie, Northern Coastal Salt Marsh, Serpentine Bunchgrass	NA	NA	NA	A	The BSA does not contain any of these habitats. No further actions are recommended for these Sensitive Natural Communities.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sensitive Plants					
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	FE, CNPS 1B.1	Freshwater marsh and swamp, and riparian scrub. 5-360 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal freshwater marsh and swamp, and riparian scrub. The BSA lacks sufficiently mesic suitable habitat. No further actions are recommended for this species.
Napa false indigo	*Amorpha californica* var. *napensis*	CNPS 1B.2	Broadleaf upland forest, chaparral, cismontane woodland; openings in forest, woodland, and chaparral. 120-2,000 m. Flowers April-July.	HP	Woodland habitat within the BSA could support this species, however, this woody perennial was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Bent-flowered fiddleneck	*Amsinckia lunaris*	BLMS, CNPS 1B.2	Cismontane woodland, valley and foothill grassland. 5-500 m. Flowers March-June.	HP	Woodland habitat within the BSA could support this species, however, it may be too shady. This perennial species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Franciscan manzanita	*Arctostaphylos franciscana*	FE, CNPS 1B.1	Serpentinite outcrops in chaparral. 60-300 m. Flowers January-April.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine substrates. The BSA lacks suitable serpentine soils and chaparral habitat. No manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.
Mt. Tamalpais manzanita	*Arctostaphylos montana* ssp. *montana*	CNPS 1B.3	Generally serpentinite soil, valley and foothill grassland. 160-760 m. Flowers February-April.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine substrates. The BSA lacks suitable serpentine soils; and no manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Presidio manzanita	*Arctostaphylos montana* ssp. *ravenii*	FE,SE, CNPS 1B.1	Serpentinite soil, chaparral, coastal prairie, coastal scrub. 20-215 m. Flowers February-April.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine substrates. The BSA lacks suitable serpentine soils and chaparral habitat. No manzanitas (a woody perennial) were observed in the BSA. No further actions are recommended for this species.
Marin manzanita	*Arctostaphylos montana* ssp. *virgata*	CNPS 1B.2	Broad-leaved upland forest, closed cone coniferous forest, chaparral, north coast coniferous forest, generally on sandstone or granitic soil. 160-760 m. Flowers December-March.	A	Limited, low quality, habitat occurs in the BSA. No manzanitas (a woody perennial) were observed. No further actions are recommended for this species.
Marsh sandwort	*Arenaria paludicola*	FE, SE, CNPS 1B.1	Freshwater marsh. 10-170 m. Flowers May-August.	A	No suitable habitat. No further actions are recommended for this species.
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	BLMS, CNPS 1B.2	Coastal salt marshes, coastal dunes, coastal scrub, stream sides. 0-30 m. Flowers April-October.	A	No suitable habitat. No further actions are recommended for this species.
Alkali milk-vetch	*Astragalus tener* var. *tener*	CNPS 1B.2	Alkali playa, valley and foothill grassland, vernal pools. 1-170 m. Flowers March-June.	A	No suitable habitat. No further actions are recommended for this species.
Tiburon mariposa lily	*Calochortus tiburonensis*	FT, ST, CNPS 1B.1	Serpentinite soil, valley and foothill grassland. Open rocky, serpentine. 50-150 m. Flowers March-June.	A	No suitable habitat. No further actions are recommended for this species.
Seaside bittercress	*Cardamine angulata*	CNPS 2B.1	North coast coniferous forest, lower montane coniferous forest, wet places. 65-951 m. Flowers April-June.	A	No suitable habitat. No further actions are recommended for this species.
Bristly sedge	*Carex comosa*	CNPS 2B.2	Marshes and swamps, lake margins, wet places.5-1,005 m. Flowers July-September.	A	Closest known occurrence was in 1866 in the Delta. No suitable habitat. No further actions are recommended for this species.
Lyngbye's sedge	*Carex lyngbyei*	CNPS 1B.1	Brackish or freshwater marshes. 0-10 m. Flowers May-August.	A	Closest known occurrence was in 1927 in Stinson Beach. No suitable habitat. No further actions are recommended for this species.
Tiburon Indian paintbrush	*Castilleja affinis* ssp. *neglecta*	FE, ST, CNPS 1B.2	Rocky serpentinite soil, valley and foothill grassland. 75-400 m. Flowers April-June.	A	No suitable habitat. No further actions are recommended for this species.
Mason's ceanothus	*Ceanothus masonii*	CNPS 1B.2	Dry rocky areas, chaparral. 230-500 m. Flowers March-April.	A	No suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Point Reyes bird's beak	*Chloropyron maritimum* ssp. *palustre*	BLMS, CNPS 1B.2	Coastal salt marsh. 0-10 m. Flowers June-October.	A	No suitable coastal salt marsh habitat. No further actions are recommended for this species.
Soft bird's beak	*Chloropyron molle (previously Cordylanthus mollis* ssp. *mollis)*	FE, SR CNPS 1B.2	Marshes and swamps (coastal salt). 0-10 m. Flowers July-November.	A	No suitable habitat. No further actions are recommended for this species.
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	CNPS 1B.2	Sandy soil, coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. 3-250 m. Flowers April-August.	A	No suitable habitat. No further actions are recommended for this species.
Franciscan thistle	*Cirsium andrewsii*	CNPS 1B.2	Moist places in broadleafed upland forest on the coast, coastal bluff scrub, coastal prairie, and coastal scrub. 0-150 m. Flowers March-July.	A	No suitable habitat. No further actions are recommended for this species.
Mt. Tamalpais thistle	*Cirsium hydrophilum* var. *vaseyi*	CNPS 1B.2	Moist places in broadleafed upland forest, chaparral, meadows and seeps. Serpentine streams. 240-620 m Flowers May-August.	A	No suitable serpentine habitat. No further actions are recommended for this species.
Presidio clarkia	*Clarkia franciscana*	FE, SE, CNPS 1B.1	Serpentinite soil, valley and foothill grassland. 25-335 m. Flowers May-July.	A	No suitable serpentine habitat. No further actions are recommended for this species.
Round-headed Chinese houses	*Collinsia corymbosa*	CNPS 1B.2	Coastal dunes.0-20 m. Flowers April-June.	A	No suitable dune habitat. No further actions are recommended for this species.
San Francisco collinsia	*Collinsia multicolor*	CNPS 1B.2	Closed-cone coniferous forest, coastal scrub, on decomposed shale in humus. 30-250m. Flowers March-May.	A	No suitable habitat. No further actions are recommended for this species.
Robust spineflower	*Chorizanthe robusta* var. *robusta*	FE, Rank 1B.1	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub, sandy or gravelly.3-300 m. Flowers April-September.	A	All known occurrences of this species in the vicinity of the BSA are associated with sandy/gravelly soils in coastal habitat. The BSA lacks suitable sandy/gravelly soils in coastal habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Sonoma spineflower	*Chorizanthe valida*	FE, SE, Rank 1B.1	Sandy coastal prairie. 10-305 m. Flowers June-August.	A	All known occurrences of this species in the vicinity of the BSA are associated with sandy soils in coastal prairie habitat. The BSA lacks suitable sandy coastal prairie habitat. No further actions are recommended for this species.
Golden larkspur	*Delphinium luteum*	FE, SR, CNPS 1B.1	Chaparral, coastal prairie, coastal scrub/rocky. 1-100 m. Flowers March-May.	A	The BSA is not in the critical habitat area and lacks suitable chaparral, coastal prairie habitat. No further actions are recommended for this species.
Western leatherwood	*Dirca occidentalis*	CNPS 1B.2	Mesic sites, broadleafed upland forest, closed-cone conifer forest, chaparral, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. 25-425 m. Flowers January- April.	HP	Woodland habitat within the BSA may support this species. This perennial woody shrub species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Tiburon buckwheat	*Eriogonum luteolum* var. *caninum*	CNPS 1B.2	Serpentinite soil, chaparral, coastal prairie, valley and foothill grassland. 0-700 m. Flowers June-September.	A	No suitable habitat. No buckwheats were observed during surveys. No further actions are recommended for this species.
Koch's cord moss	*Entosthodon kochii*	CNPS 1B.3	Cismontane woodland and valley foothill grassland. Know from Plumas NF on serpentine river bank. 500-1,000 m. Flowers N/A.	A	No suitable serpentine habitat. No further actions are recommended for this species.
Minute pocket moss	*Fissidens pauperculus*	USFSS, CNPS 1B.2	North coast coniferous forest. On damp soil on the coast and in dry streambeds and banks. 10-100 m. Flowers N/A (best observed during the wet season).	HP	Mesic substrates within the BSA may have the potential to support this species. Though the site is not in a coniferous forest, which typically has an acidic soil. This species was not observed during the field surveys, which occurred during the wet season. No further actions are recommended for this species.
Marin checker lily	*Fritillaria lanceolata* var. *tristulis*	CNPS 1B.1	Coastal bluff scrub, coastal prairie, coastal scrub. Canyons and riparian areas and rocky outcrops. 15-150 m. Flowers February-April.	HP	Though not coastal, there is riparian habitat within the BSA. No *Fritillaria* were observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Fragrant fritillary	*Fritillaria liliacea*	USFSS, CNPS 1B.2	Coastal scrub, valley and foothill grassland, coastal prairie. Usually on clay soils, often on serpentine in grassland.3-410 m. Flowers February- April.	A	No suitable habitat. No further actions are recommended for this species.
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	CNPS 1B.1	Coastal dunes, coastal scrub. Elevation range: 2-180 m. Flowers April-July.	A	The BSA lacks suitable coastal dune and scrub habitat. No further actions are recommended for this species.
Woolly-headed gilia	*Gilia capitata* ssp. *tomentosa*	CNPS 1B.1	Rocky serpentine outcrops in coastal bluff scrub and valley and foothill grassland. 10-220 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine soils in coastal bluff scrub and valley and foothill grassland. The BSA lacks suitable serpentine soils in coastal bluff scrub and valley and foothill grassland habitat. No further actions are recommended for this species.
Dark-eyed gilia	*Gilia millefoliata*	CNPS 1B.2, BLMS	Coastal dunes. 2-30 m. Flowers April-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal dunes. The BSA lacks suitable coastal dune habitat. No further actions are recommended for this species.
Diablo helianthella	*Helianthella castanea*	CNPS 1B.2, BLMS	Broadleaved upland forest, chaparral, coastal scrub, cismontane woodland, riparian woodland, valley and foothill grassland. 25-1150 m. Flowers April to June.	HP	The BSA is disturbed, though has low quality habitat present. No *Helianthella* were observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
White seaside tarplant	*Hemizonia congesta* ssp. *congesta (Hemizonia congesta* ssp. *leucocephala)*	CNPS 1B.2	Coastal scrub, valley and foothill grassland; located in grassy valleys, hills, and fallow fields. 20-550 m. Flowers April-November.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal scrub and valley and foothill grassland. Surveys were conducted during the flowering period. The BSA lacks suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Marin western flax	*Hesperolinon congestum*	FT, ST, CNPS 1B.1	Serpentinite soil, chaparral, valley and foothill grassland. Known only from Marin, San Francisco, and San Mateo counties. In serpentine barrens and in serpentine grassland chaparral. 5-370 m. Flowers April-July.	A	The BSA lacks suitable habitat for this species. No further actions are recommended for this species.
Water star-grass	*Heteranthera dubia*	CNPS 2B.2	Requires a pH of 7 or higher, usually in slightly eutrophic waters. Marshes and swamps (alkaline, still or slow-moving water). 30-1495 m. Flowers July-October.	A	The BSA lacks suitable habitat for this species. No further actions are recommended for this species.
Santa Cruz tarplant	*Holocarpha macradenia*	FT, CE, CNPS 1B.1	Coastal prairie, coastal scrub, Valley and foothill grassland, often clay. 10-20 m. Flowers June-October.	A	The BSA lacks suitable habitat for this species. No further actions are recommended for this species.
Kellogg's horkelia	*Horkelia cuneata* var. *sericea*	CNPS 1B.2, BLMS	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub, openings, sandy/gravelly. 10-200 m. Flowers April-Sept.	A	The BSA lacks suitable habitat for this species. No further actions are recommended for this species.
Thin-lobed horkelia	*Horkelia tenuiloba*	CNPS 1B.2, BLMS	Broadleaf upland forest, chaparral, valley and foothill grassland/mesic openings, sandy. 50-500 m. Flowers May-July.	HP	Mesic soils within the BSA are in the creek bed. They provide limited habitat for this species. It was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Small groundcone	*Kopsiopsis hookeri*	CNPS 2.3	North coast coniferous forest, generally on salal (*Gaultheria willon*) and *Vaccinium*. 90-885 m. Flowers April-August.	A	The BSA lacks suitable habitat for this species. No further actions are recommended for this species.
Contra costa goldfields	*Lasthenia conjugens*	FE, CNPS 1B.2	Cismontane woodland, playas (alkaline), valley and foothill grassland, vernal pools. 0-470 m. Flowers March-April.	A	The streambed does not provide suitable habitat. The rest of the BSA is too dry for this species. This species was not observed during the surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Beach layia	*Layia carnosa*	FE, SE, CNPS 1B.1	Sandy soil, coastal dunes, coastal scrub. 0-60 m. Flowers March-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal scrub and dunes. The BSA lacks suitable habitat. No further actions are recommended for this species.
Rose leptosiphon	*Leptosiphon rosaceus*	CNPS 1B.1	Coastal bluff scrub. 0-100 m. Flowers April-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal bluff scrub. The BSA lacks suitable coastal bluff scrub habitat. No further actions are recommended for this species.
San Francisco lessingia	*Lessingia germanorum*	FE, SE, CNPS 1B.1	Coastal scrub (remnant dunes) 25-110 m. Flowers June-November.	A	The BSA lacks suitable habitat. No further actions are recommended for this species.
Tamalpais lessingia	*Lessingia micradenia var. micradenia*	CNPS 1B.2	Chaparral, valley and foothill grassland; usually located on serpentine substrate, often roadsides. 10-500 m. Flowers June-October.	A	The BSA lacks serpentine and suitable habitat. No further actions are recommended for this species.
Pitkin Marsh lily	*Lilium pardalinum ssp. pitkinense*	FE, SE, CNPS 1B.1	Cismontane woodland, meadows and seeps, marshes and swamps (freshwater), mesic and sandy. 35-65 m. Flowers June-July.	A	Known only from near Sebastopol. The mesic area in the BSA does not provide appropriate habitat. This species was not observed during the field surveys, which was conducted during the flowering period. No further actions are recommended for this species.
Sebastopol meadowfoam	*Limnanthes vinculans*	FE, SE, CNPS 1B.1	Meadows and seeps, valley and foothill grassland, vernal pools, vernally mesic. 15-305 m. Flowers April-May.	A	The BSA lacks suitable grassland and vernal pool habitat. No further actions are recommended for this species.
Tidestrom's lupine	*Lupinus tidestromii*	FE, SE, CNPS 1B.1	Coastal dunes. 0-100 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with coastal dunes. The BSA lacks suitable coastal dune habitat. No further actions are recommended for this species.
Marsh microseris	*Microseris paludosa*	CNPS 1B.2	Moist places, closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. 5-300 m. Flowers April-June.	HP	The BSA provides marginal disturbed habitat for this species, however, this species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Elongate copper moss	*Mielichhoferia elongata*	CNPS 2B.2	Cismontane woodland/ metamorphic, rock, usually vernally mesic. 500-1300 m.	A	The BSA lacks suitable metamorphic rock. This species was not observed during the field surveys. No further actions are recommended for this species.
Marin County navarretia	*Navarretia rosulata*	CNPS 1B.2	Rocky serpentinite soil, closed-cone coniferous forest, chaparral. 200-635 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentinite soil in closed-cone coniferous forest, chaparral. The BSA lacks suitable habitat. No further actions are recommended for this species.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	FE, SE, CNPS 1B.1	Valley and foothill grassland, coastal scrub, coastal prairie, open dry rocky areas, often serpentine. 35-620 m. Flowers March-May.	A	The BSA lacks suitable dry rocky habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Choris' popcorn-flower	*Plagiobothrys chorisianus* var. *chorisianus*	CNPS 1B.1	Moist places, coastal prairie, coastal scrub, chaparral, seasonal marsh. Known only from San Francisco southward. 60-485 m. Flowers March-June	A	The BSA lacks suitable habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
San Francisco popcorn-flower	*Plagiobothrys diffusus*	SE, CNPS 1B	Seasonally moist places, coastal prairie, valley and foothill grassland. Known only from San Francisco southward. 0-100 m. Flowers April-June.	A	The BSA lacks suitable habit. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Hairless popcorn-flower	*Plagiobothrys glaber*	CNPS 1A	Alkaline meadows and seeps, coastal salt marshes.0-100 m. Flowers March-May	A	Historically occurred on grassy slopes with marine influence. The BSA lacks suitable habit. This species was not observed during the field surveys. No further actions are recommended for this species.
North coast semaphore grass	*Pleuropogon hooverianus*	BLMS, ST, CNPS 1B.1	Moist, open to shaded areas, broadleafed upland forest, meadows and seeps, north coast coniferous forest. Marshy areas.10-1,150 m. Flowers May-August.	HP	Limited suitable habitat for this species may be present in the BSA, however, this species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Oregon polemonium	*Polemonium carneum*	CNPS 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. 0-1,830m. Flowers April-September.	A	The BSA lacks suitable habitat. This species was not observed during the field surveys, which was conducted during the flowering period. No further actions are recommended for this species.
Hickman's potentilla	*Potentilla hickmanii*	FE, SE, CNPS 1B.1	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps (vernally mesic), marshes and swamps (freshwater). 10-149 m. Flowers April-August.	A	The closest known occurrence is south of San Francisco. The BSA lacks suitable habitat. No further actions are recommended for this species.
Tamalpais oak	*Quercus parvula* var. *tamalpaisensis*	CNPS 1B.3	Lower montane coniferous forest. 100-750 m. Flowers March-April.	HP	Suitable habitat for this species may be present in the BSA. This species is a woody shrub, which if present, would have been observed during the field surveys. No further actions are recommended for this species.
Adobe sanicle	*Sanicula maritima*	USFSS, SE, CNPS 1B.1	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland, often clay and serpentine. 30-240 m. Flowers February-May.	A	Suitable clay and serpentine habitat for this species is not present in the BSA. The closest known occurrence is a population believed to be extinct, south of San Francisco. No further actions are recommended for this species.
Point Reyes checkerbloom	*Sidalcea calycosa* ssp. *rhizomata*	CNPS 1B.2	Freshwater marshes and swamps near the coast. 3-75 m. Flowers April-September.	A	All known occurrences of this species in the vicinity of the BSA are associated with marsh habitat. The BSA lacks suitable marsh habitat. No further actions are recommended for this species.
Marin checkerbloom	*Sidalcea hickmanii* ssp. *viridis*	CNPS 1B.3	Chaparral; located on serpentine or volcanic substrate; often observed following burns. 50-425 m. Flowers May-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine or volcanic substrates. The BSA lacks suitable serpentine or volcanic substrate habitat. No further actions are recommended for this species.
San Francisco campion	*Silene verecunda* ssp. *verecunda*	CNPS 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland, often mudstone, one on serpentine. 30-645 m. Flowers March-August.	A	All known occurrences of this species in the vicinity of the BSA are associated with mudstone or serpentine in coastal scrub or bluff scrub, chaparral, coastal prairie or valley and foothill grassland. The BSA lacks suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Santa Cruz microseris	*Stebbinsoseris decipiens*	CNPS 1B.2	Open areas in broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. 30-645 m. Flowers April-May.	HP	Limited suitable habitat for this species may be present in the BSA, however, this species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Tamalpais jewel-flower	*Streptanthus batrachopus*	CNPS 1B.3	Serpentinite soil, chaparral, closed-cone coniferous forest. 305-650 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine outcrops or openings. The BSA lacks suitable habitat. No further actions are recommended for this species.
Mt. Tamalpais bristly jewel-flower	*Streptanthus glandulosus* ssp. *pulchellus*	CNPS 1B.2	Serpentinite soil/talus, chaparral, valley and foothill grassland. 150-800 m. Flowers May-July.	A	All known occurrences of this species in the vicinity of the BSA are associated with serpentine outcrops or openings. The BSA lacks suitable habitat. No further actions are recommended for this species.
Tiburon jewel-flower	*Streptanthus glandulosus* ssp. *niger (previously Streptanthus niger)*	FE, SE, CNPS 1B.1	Serpentinite soil, valley and foothill grassland. 30-150 m. Flowers May-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with willow rocky serpentine soil. The BSA lacks suitable habitat. No further actions are recommended for this species.
Suisun Marsh aster	*Symphyotrichum lentum*	CNPS 1B.2	Brackish and freshwater marshes and swamps.0-3 m. Flowers May-November.	A	All known occurrences of this species in the vicinity of the BSA are found along seasonally wet sloughs and marshes. The BSA lacks suitable habitat. No further actions are recommended for this species.
Showy rancheria clover	*Trifolium amoenum*	FE, CNPS 1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite), open sunny sites.5-415 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are found in open sunny sites in chaparral and grassland. The BSA has limited suitable habitat. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Saline clover	*Trifolium hydrophilum (*syn. *Trifolium depauperatum var. hydrophilum)*	CNPS 1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. 0-300 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the BSA are associated with alkaline or saline wetlands. The BSA lacks suitable habitat. No further actions are recommended for this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
San Francisco owl's-clover	*Triphysaria floribunda*	CNPS 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland, generally serpentinite soil.10-160 m. Flowers April-June.	A	The BSA does not provide suitable habitat. This species was not observed during the field surveys, which were conducted during the flowering period. No further actions are recommended for this species.
Coastal triquetrella	*Triquetrella californica*	CNPS 1B.2	Coastal prairie, coastal scrub. Grows within 30 meters of the coast on gravelly rocky soil. 30-150 m. Flowers May-June.	A	Known in CA from fewer than ten small coastal occurrences, and in in OR from only one occurrence. The BSA does not provide suitable habitat. No further actions are recommended for this species

* Key to status codes:

FE	Federal Endangered
FT	Federal Threatened
FD	Federal Delisted
FC	Federal Candidate
BCC	USFWS Birds of Conservation Concern
MMPA	Species protected under the Marine Mammal Protection Act
SE	State Endangered
ST	State Threatened
SR	State Rare
SSC	CDFW Species of Special Concern
CFP	CDFW Fully Protected Animal
WBWG	Western Bat Working Group (High or Medium) Priority species
BLMS	Bureau of Land Management Sensitive Species
USFSS	U.S. Forest Service Sensitive Species
CNPS 1A	CNPS Rare Plant Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CNPS 1B	CNPS Rare Plant Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
CNPS 2A	CNPS Rare Plant Rank 2A: Plants presumed extirpated in California, but more common elsewhere
CNPS 2B	CNPS Rare Plant Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
CNPS 3	CNPS are Plant Rank 3: Plants about which more information is needed – a review list
CNPS 4	CNPS Rare Plant Rank 4: Plants of limited distribution – a watch list

CNPS Rare Plant Threat Ranks

0.1-Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2-Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3-Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

*Presence:
Absent [A] - no habitat present and no further work needed.
Habitat Present [HP] -habitat is, or may be present. The species may be present.
Present [P] - the species is present.
Critical Habitat [CH] - proposed project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is *present.*

Chapter 4 – Results: Biological Resources, Discussion of Impacts and Mitigation

Habitats and Natural Communities of Special Concern

Habitats are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals occurring on site. Three natural communities of special concern found to be present in the BSA, Riparian Woodland, Perennial Stream (comprised of "Other Waters" and Wetlands), and Unvegetated Bank. The Unvegetated Bank is included in the table below solely because it is considered part of the federal-designated Critical Habitat for two species, CCC steelhead and Coho salmon. These communities are summarized in Table 2 and discussed below, and shown on the Biological Communities Map Figure 3a. The "other waters" and wetlands are also considered sensitive by both federal and state agencies, due to the regulatory and jurisdictional aspects discussed in more detail within the Jurisdictional Delineation Report.

Figure 3b shows the areas of the proposed project's impacts. The following sections present a discussion of the impacts and mitigation for each natural community of special concern. Permanent impacts are a conversion of a natural community to structures such as, bridge support or to an area of engineered slope stabilization. Temporary impacts are disturbances to existing natural communities that would be restored to the same natural community type following construction (such as dewatering).

Table 2: Direct Impacts of the Proposed Project to Natural Communities of Special Concern.

Natural Community of Special Concern	Permanent Impacts	Temporary Impacts
Riparian Woodland	0.003 acre (121 ft^2)	<0.001 acre (35 ft^2)
Perennial Stream		
"Other Waters"	<0.001 acre (20 ft^2)/ 25 linear feet	0.075 acre (3,265 ft^2)/ 275 linear feet
Wetlands	0.0 ft^2	<0.001 acre (22 ft^2)
Unvegetated Bank (included here because it is considered part of the federal-designated Critical Habitat for CCC steelhead and Coho salmon.)	0.001 acre (58 ft^2)	0.010 acre (416 ft^2)
Total (and Total for Critical Habitat for CCC steelhead and Coho salmon.)	0.005 acre (199 ft^2)	0.086 acre (3,738 ft^2)

Table 3: Direct Impacts of the Proposed Project to Jurisdictional Areas by Agency.

Agencies Jurisdiction	Permanent Impacts	Temporary Impacts
CDFW (Riparian woodland, unvegetated bank, and creek bed)	0.005 acre (199 ft^2)	0.086 acre (3,738 ft^2)
USACE and RWQCB (creek bed)	<0.001 acre (20 ft^2)	0.075 acre (3,287 ft^2)
NMFS (Riparian woodland, unvegetated bank, and creek bed because of critical habitat)	0.005 acre (199 ft^2)	0.086 acre (3,738 ft^2)

RIPARIAN WOODLAND

Riparian Woodland Survey Results

Upland plant communities in the BSA are comprised of Ruderal Disturbed/Developed, which is not a habitat of concern and Riparian Woodland, which is discussed here. The Riparian Woodland is similar to California Bay Forest Alliance (G4, S3, Sawyer, J., T. Keeler-Wolf and J. Evens. 2009). The Riparian Woodland community is ranked S3, it is considered a natural community of special concern (sensitive). California bay forest/woodlands are common in the vicinity of the BSA. The overstory consists of native tree species (such as big-leaf maple, California bay, and California walnut). Within the BSA there are several small scattered alders and willows, which are indicative of a riparian community. In the BSA the community would be considered a woodland rather than a riparian zone because of the scattered and sparse occurrence of these species. The area of Riparian Woodland impacted by the proposed project is minor in the context of the surrounding landscape and relative abundance of this community in Marin County. Approximately 0.64 acre of Riparian Woodland is present in the BSA (Figure 3a).

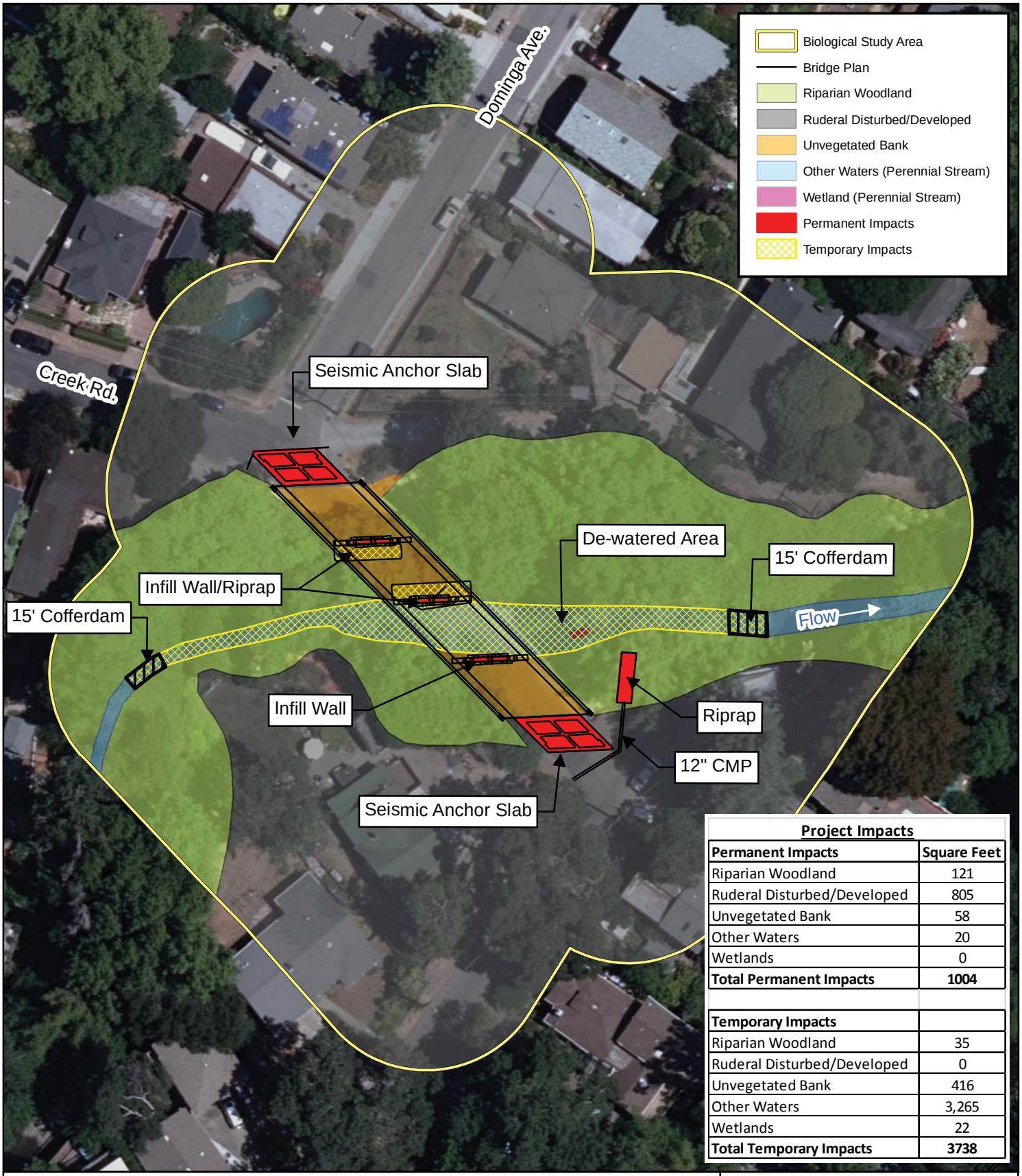
Riparian Woodland Avoidance and Minimization Efforts

The following avoidance and minimization measures would be employed to avoid or minimize impacts to the greatest extent possible:

- The proposed project has been designed to minimize impacts to trees to the maximum extent feasible.
- Temporarily impacted areas in this habitat would be revegetated with native, non-invasive plants suitable for the soil and site conditions.
- Silt fencing or other approved sediment trapping would be installed down gradient of the work site to minimize off-site transport of sediments.
- Exclusion fencing would be installed along the limits of clearing and grubbing to prevent encroachment into undisturbed habitats.

Riparian Woodland Project Impacts

As summarized in Table 2 above, 0.003 acre of permanent impacts and <0.001 acre of temporary impacts to riparian woodland are unavoidable as a result of proposed project construction. Temporary direct impacts to Riparian Woodlands would result from tree trimming, if needed, for construction access. These areas would be revegetated following construction activities. Minor temporary indirect impacts to Riparian Woodlands would result from



Project Impacts

Permanent Impacts	Square Feet
Riparian Woodland	121
Ruderal Disturbed/Developed	805
Unvegetated Bank	58
Other Waters	20
Wetlands	0
Total Permanent Impacts	**1004**

Temporary Impacts	
Riparian Woodland	35
Ruderal Disturbed/Developed	0
Unvegetated Bank	416
Other Waters	3,265
Wetlands	22
Total Temporary Impacts	**3738**

Figure 3b. Biological Communities Impacted within the Biological Study Area

N
W E
S

0 25 50 100
Feet

Creek Road Bridge NES
Marin County, California

wra
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Map Prepared Date: 11/23/2015
Map Prepared By: dchan
Base Source: Marin County (2014)
Data Source(s): WRA

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construction activities including increased dust deposition on adjacent vegetation. Permanent impacts would occur when the stormdrain outfall is replaced and stabilized with rock.

Riparian Woodland Compensatory Mitigation

Areas of temporary impacts to this natural community will be revegetated following construction. To the extent feasible areas amid or adjacent to the rock used to stabilize the stormdrain will be revegetated with appropriate native species. There is one small (<6" DBH) alder near the rock work. The alder would be avoided if possible. If it must be removed, it will be replaced on-site. No other permanent direct or indirect, or temporary direct or indirect impacts to alders or willows are proposed.

Riparian Woodland Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. Therefore, cumulative effects are not anticipated for this proposed project.

PERENNIAL STREAM ("OTHER WATERS" AND WETLANDS)

Perennial Stream ("Other Waters"and Wetlands) Survey Results

San Anselmo Creek supports the Perennial Stream Biological Community, which is comprised of approximately 0.10 acre (375 linear feet) of "other waters" and less than 0.001 acre (22 square feet) of wetlands. Flows vary with the rainfall patterns of a given year. The watershed that supports it is a local area, primarily the western part of the Town of Fairfax and adjacent open space lands. Flows within the creek at the time of the site visits in the spring of 2015 were low; only a few inches of water remained within a low flow channel that narrowed to several feet wide in places, though one or two deeper pools are likely to persist year-round in the BSA. Wrack observed at the edge of the creek bed was used as an indication of OHW. Creek substrate consists of small gravel to larger cobble. The area below the OHW mark is "other waters". Its boundary is shown on Figure 3a.

A 7-foot by 3-foot wetland area occurs on a low gravel bar within the creek bed. The dominant vegetation found here includes hoita (*Hoita macrostachya*) (OBL), fig (*Ficus carica*) (FACU), alder (*Alnus rhombifolia)* (FACW), and Armenian blackberry (*Rubus armeniacus*) (FACU). The soils are silty sand with 1-3 inch cobble and a chroma of 10YR3/2.

Pursuant to the Clean Water Act Section 404 and 401 the creek below OHW including the wetland would be within the USACE and RWCQB jurisdiction. It would also be protected by Porter Cologne (RWQCB). There are no areas in the BSA that would be considered Waters of the State that are not Waters of the US. The portion of the creek channel that is vegetated with hydrophytic species is a jurisdictional wetland the rest is "other waters".

Perenial Stream and Wetlands Avoidance and Minimization Efforts

The following measures are included to avoid and/or minimize and restore potential impacts to creek habitat resulting from the use of mechanical equipment in the creek bed.

- The primary construction would be completed during the dry season, between April 15 and October 15.

- Final grading in the creek bed would conform to the existing creek channel both downstream and upstream, and existing bed materials would be replaced with similar sized materials.

- Regulatory approval would be obtained for all work within potentially jurisdictional areas, including approval from the USACE, RWQCB, CDFW, and NMFS. All work within these areas will conform to any conditions imposed by the regulating agencies.

- Prior to any clearing, grubbing, pruning, or groundbreaking activity, the limits of construction would be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas, including all riparian or wetland vegetation and prevent any equipment from unnecessarily extending the work area or entering the wetted channel. In addition, silt fencing would be installed at the base of the construction fencing to prevent debris from entering the creek. All fencing would be removed upon proposed project completion.

- Prior to construction, the contractor would be required to prepare an Accidental Spill Prevention and Cleanup Plan. This plan would include required spill control absorbent material, for use beneath stationary equipment, to be present on-site and available at all times.

- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material would be in place underneath this equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, would occur outside the creek's top-of-bank. Any hazardous chemical spills would be cleaned immediately.

- All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, refueling and maintenance, would occur outside the creek channel. No equipment would be washed where runoff could enter the creek.

- No motorized equipment is to be left within the channel (top of bank to top of bank) overnight, unless a container or similar method is securely placed beneath the equipment to catch any fluid leakage. All contained fluids would be disposed of in a permitted manner.

- The contractor would be required to use a drilling mud and slurry seal that is nontoxic to aquatic life if there are drilling activities related to construction of the proposed project. All drilling muds and fluid would be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities would be collected and not allowed to flow into the creek.

- No equipment, including concrete trucks, would be washed within the channel of the creek, or where wash water could flow into the channel. Prior to proposed project construction, the contractor would establish a concrete washout area for concrete trucks in a location where wash water would not enter the creek or adjacent areas. The washout area would follow the practices outlined in the San Francisco Bay Regional Water Quality Control Board Erosion and Sediment Control Field Manual (page 107-108, July 1999) or equivalent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of the Town of Fairfax.

- All water that comes in contact with wet concrete must be pumped directly into tanks and disposed of at a permitted location.

- If work is to occur on the roadway and bridge approaches during the period October 15 to June 15, all drainage inlets within the proposed project site would be protected from

receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.

- Water encountered during construction of the bridge foundations would be managed in accordance with an approved dewatering plan.

- All workers would ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the BSA are deposited in covered or closed trash containers. The trash containers would not be left open and unattended overnight.

- The Town of Fairfax will require that all disturbed areas around the bridge bents and abutments be re-graded to match the surrounding topography by October 15. Seed and certified weed-free straw will be placed on disturbed areas in the proposed project site (with the exception of the lower creek banks, creek bed, and areas below the OHW mark). A jute mesh type or equivalent matting will be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the Town of Fairfax.

- After construction, the project site would be inspected following the first heavy rain, during the middle of the rainy season and at the end of the rainy season. During each visit areas of significant erosion or erosion control device failure would be noted and appropriate remedial actions taken.

With the implementation of these measures, it is expected that the proposed project would not result in substantial adverse impacts to creek habitat.

Perenial Stream and Wetlands Project Impacts

As summarized in Table 2 above, <0.001 acre (20 square feet, approximately 25 linear feet) of permanent impacts and 0.075 acre (3,265 square feet, approximately 275 linear feet) of temporary impacts to potentially jurisdictional "other waters" (creek bed) are proposed. The proposed project would result in less than 0.001 acre (22 ft^2) of temporary impacts and no permanent impacts to wetlands.

Temporary, direct impacts to the creek would occur as a result of temporary trenching within the creek bed for modifying bent footings and during dewatering. Cofferdams would be constructed in the creek to temporarily dewater the proposed project area. Infill walls would be constructed between each pair of columns at each of the bridge bents. Infill walls would result in the permanent fill within the creek bed.

Temporary, indirect impacts may occur if construction-related sediment enters creeks within the BSA. However, implementation of construction BMPs described above would ensure such impacts are avoided.

Perenial Stream and Wetlands Compensatory Mitigation

All proposed project activities would adhere strictly to avoidance and minimization measures detailed above. Because the infill walls would result in the permanent fill of <0.001 acre (20 square feet, approximately 25 linear feet) within the creek bed, "other waters" compensatory mitigation would be required. The proposed project would not result in a permanent loss of wetlands which would require wetland mitigation.

Perenial Stream and Wetlands Cumulative Impacts

No future public or private activities are known to be planned or reasonably foreseen for the BSA vicinity. The proposed project would result in minimal permanent changes to the creek bed and no impacts to wetlands. Therefore, cumulative effects are not anticipated for this project.

Special-Status Plant Species

Based upon a review of the resources and databases discussed in Section 2, 76 special-status plant species have been documented in the vicinity of the BSA. Figure 4 shows special-status plant species within 8 kilometers (5 miles) of the BSA documented in CNDDB (CDFW 2016). No special-status plant critical habitat exists within the proposed project area. Table 1 discusses the potential for each of the special-status plant species to occur in the BSA. Suitable habitat is present in the BSA for 11 of the species. Key points regarding those species are summarized here.

- Napa false indigo (*Amorpha californica var. napensis,* CNPS 1B.2). Woodland habitat within the BSA could support this species. However, this shrub species, which is easily identifiable, was not observed during the field surveys.

- Bent-flowered fiddleneck (*Amsinckia lunaris,* BLMS, CNPS 1B.2). Woodland habitat within the BSA could support this species. However, it may be too shady. No *Amsinckia* species were observed in the BSA. If this perennial species was present, it would have been identified during the field surveys, which were conducted during the flowering period.

- Western leatherwood (*Dirca occidentalis,* CNPS 1B.2). Woodland habitat within the BSA could support this species. However, this woody perennial species, which is typically over 3 feet tall was not observed during the field surveys.

- Minute pocket moss (*Fissidens pauperculus,* USFSS, CNPS 1B.2). Mesic substrates within the BSA could support this species. However, the site is not in coniferous forest, a typical requirement for this species. This species was not observed during the field surveys which occurred during the appropriate wet season.

- Marin checker lily (*Fritillaria lanceolata* var*. tristulis,* CNPS 1B.1). Though not coastal, there is riparian habitat within the BSA. No *Fritillaria* (a perennial bulbiferous herb) were observed during the field surveys, which were conducted during the flowering period.

- Diablo helianthella (*Helianthella castanea,* CNPS 1B.2, BLMS). The BSA is disturbed, though has low quality habitat present. This perennial herb is more prevalent in the East Bay, than in Marin. No *Helianthella* were observed during the field surveys, which were conducted during the flowering period.

- Thin-lobed horkelia (*Horkelia tenuiloba,* CNPS 1B.2, BLMS). The only mesic soils within the BSA are at edge of the creek bed or on the gravel bar. These areas provide limited habitat for this species. Though high flows would likely damage plants. This species was not observed during the field surveys, which were conducted during the flowering period.

- Marsh microseris (*Microseris paludosa,* CNPS 1B.2). Typically this species occurs in closed cone coniferous forest or cismontane woodland in mesic areas. The BSA provides marginal disturbed habitat. However, this perennial herbaceous species was not observed during the field surveys, which were conducted during the flowering period.

- North coast semaphore grass (*Pleuropogon hooverianus,* BLMS, ST, CNPS 1B.1). This species occurs in moist, open to shaded areas, broadleafed upland forest in wet areas. The site provides marginal habitat, but high creek flows and seasonal drying of the creek bed limit the

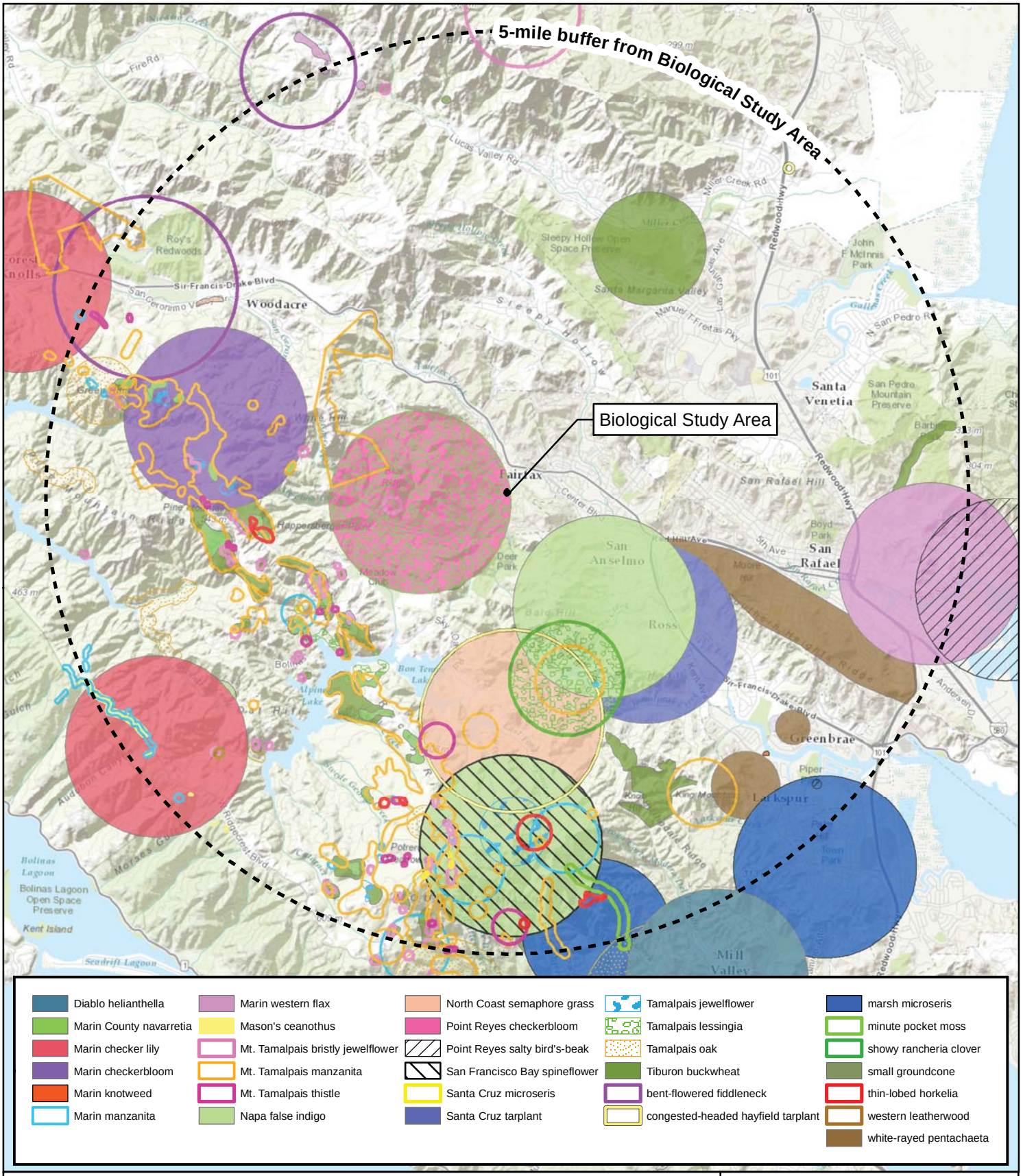


Figure 4: Special-Status Plant Species within 8 kilometers (5 miles) of the Biological Study Area

N
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Creek Road Bridge NES
Marin County, California

0 1 2 4
Miles

Map Prepared Date: 6/1/2015
Map Prepared By: dchan
Base Source: ESRI/National Geographic
Data Source(s): WRA, CNDDB

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habitat. This species was not observed during the field surveys, which were conducted during the flowering period.

- Tamalpais oak (*Quercus parvula* var. *tamalpaisensis,* CNPS 1B.3). Though, the BSA provides woodland habitat, this species is a woody shrub, which would have been identifiable during the site visits. No shrubby oaks were observed during the field surveys.

- Santa Cruz microseris (*Stebbinsoseris decipiens,* CNPS 1B.2). This species occurs in open areas in broadleafed upland forest and other habitats. The only open area is the top of the bank, which is heavily disturbed. Most of the vegetation found there was ruderal and non-native. This species was not observed during the field surveys, which were conducted during the flowering period.

The remaining special-status plant species documented in the vicinity are unlikely to occur in the BSA based on lack of suitable habitats (such as coastal dunes, coastal prairie, coastal salt marsh or vernal pools) or specific substrates (i.e. serpentine, volcanic rock). The BSA is in a residential area, with structures (houses, sheds, etc.), fenced backyards, and landscape areas extending to the top of bank. Most of the creek bank (below the top of bank) is densely vegetated with English ivy, California blackberry, and Himalayan blackberry. The areas that are not vegetated, are bare dirt or covered with large rock riprap. With the exception of one small gravel bar, the creek bed is generally unvegetated.

No special-status plant species were observed in the BSA during floristic surveys completed during the appropriate flowering periods. No effects on special-status plant species are anticipated and no further discussion of special-status plant species is necessary.

Special-Status Wildlife Species

One hundred-one special-status wildlife species have been documented in the CNDDB and USFWS records as potentially occurring in the quadrangles or noted in a review of other resources as having overlapping ranges and habitat requirements (Table 1 and Appendix B). Fifteen of these special-status wildlife species have been documented in CNDDB within 8 kilometers (5 miles) of the BSA (Figure 5). During the site assessment, two special-status wildlife species, Nuttall's woodpecker (*Picoides nuttallii*) and oak titmouse (*Baeolophus inornatus*), were observed foraging in the BSA.

The segment of San Anselmo Creek which runs through the BSA is designated critical habitat for both Coho salmon (64 FR 24049, 73 FR 7816) and steelhead (70 FR 52488, 70 FR 52630), and EFH for Pacific Salmonids. Coho salmon are considered extirpated from San Francisco Bay and all of its tributaries, thus they would not be affected by the proposed project (NMFS 2012, Brown and Moyle 1991). However, steelhead are presumed present in San Anselmo Creek. Following the implementation of avoidance and minimization measures outlined in the section below, the proposed project is anticipated to have no permanent adverse effect on steelhead, critical habitat, or EFH.

Of the 101 special-status wildlife species documented to occur in the vicinity, six species have a moderate or high potential to occur. The remaining 95 species identified in Table 1 are unlikely to occur within the BSA because of existing conditions within and surrounding the BSA. Roadways, residential development, and various anthropogenic disturbances greatly reduce the amount of available breeding, rearing, and foraging habitat for most special-status species. Several habitat types or habitat conditions which are required to support special-status wildlife species are also absent from the BSA, such as marsh, open grassland, coniferous forests, and serpentine habitats.

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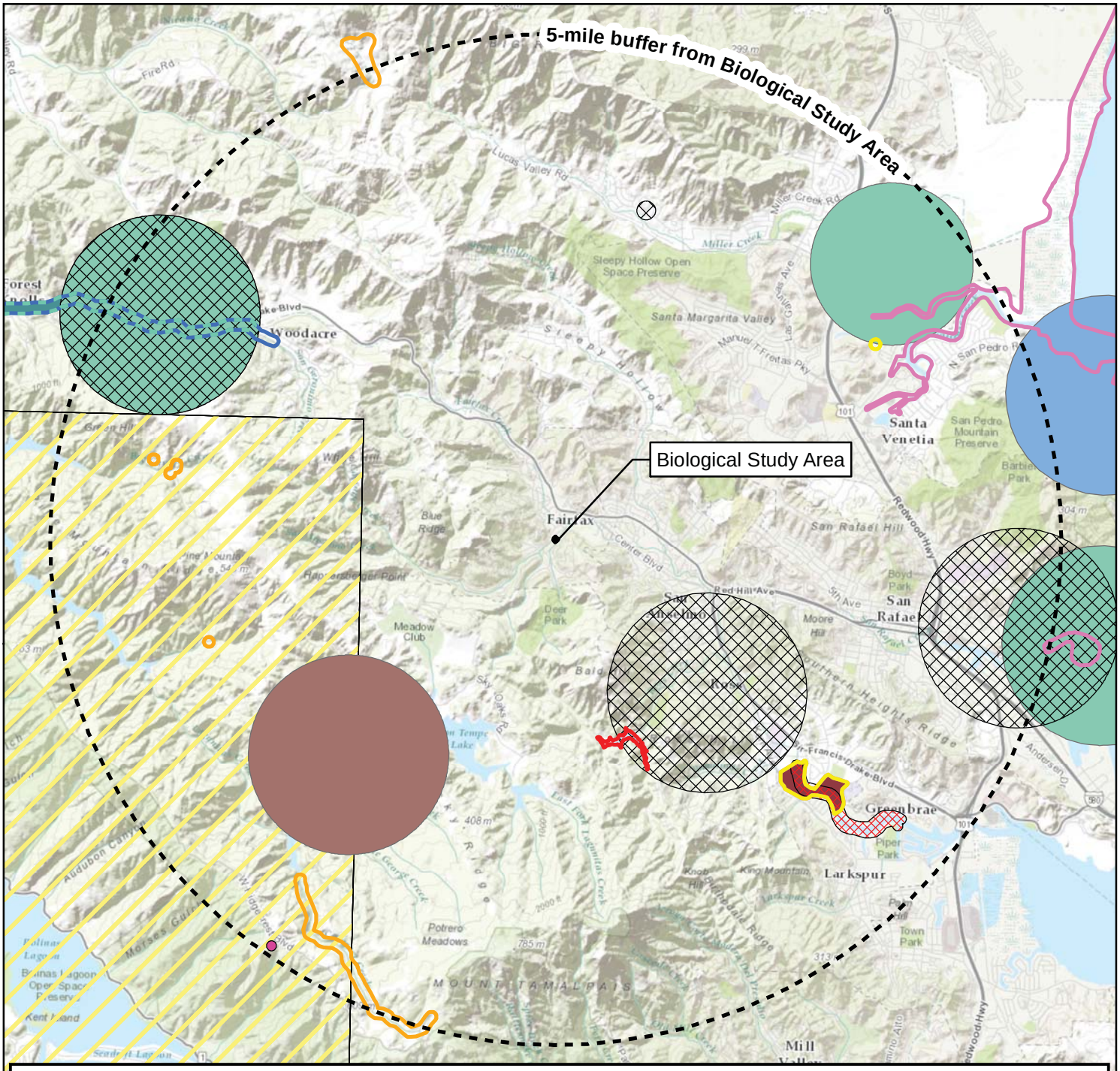


Figure 5: Special-Status Wildlife Species within 8 kilometers (5 miles) of the Biological Study Area

Creek Road Bridge NES
Marin County, California

0 1 2 4
Miles

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 6/3/2015
Map Prepared By: dchan
Base Source: ESRI/National Geographic
Data Source(s): WRA, CNDDB

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Northern spotted owls (*Strix occidentalis caurina*), Federal Threatened and State Candidate Threatened, are documented within 0.75 mile of the BSA. However, northern spotted owls require undisturbed fir or redwood forests for foraging and nesting. These forests types and coniferous trees are not present within or adjacent to the BSA. Typical disturbance buffers for northern spotted owl are 0.25 mile. The nearest potential nesting habitat and nearest documented occurrences are both greater than 0.25 mile from the BSA; therefore, the proposed project is not anticipated to disturb northern spotted owl nesting in the region. The absence of fir and redwood forest within the BSA, distance to suitable habitat, and baseline levels of anthropogenic disturbance from surrounding residential development reduce the potential for northern spotted owl to be present near the BSA or disturbed by proposed project activities. In addition, no trees are to be removed by the proposed project. Therefore, the proposed project would have no effect on northern spotted owl.

Trees within the BSA are primarily California bay and do not provide cavities or complex foliage required to support tree roosting bats. The underside of the bridge structure is also solid with no gaps, openings, or seams which could potentially be used by roosting bats. The BSA also receives a high level of human disturbance from the residences and traffic in the vicinity further reducing the potential for special-status bat species such as Townsend's big-eared bat (*Corynorhinus townsendii*) or western red bat (*Lasiurus blossevillii*) to occur within the BSA. Both of these species are highly sensitive to disturbance at roost sites. The absence of roost sites and other habitat features within the BSA makes the presence of special-status bats or other bat species unlikely. Therefore, the proposed project would have no effect on roosting bats.

Special-status amphibian and reptile species such as foothill yellow-legged frog (*Rana boylii*), California red-legged frog (*Rana draytonii*), and Pacific pond turtle (*Actinemys marmorata*) are also unlikely to occur. No occurrences of these species have been documented within the watershed, and California red-legged frog is not known within this portion of Marin County nor documented within 5 miles of the BSA. Nearby occurrences of foothill yellow-legged frog and Pacific pond turtle are located outside the watershed and greater than 1.25 miles from the BSA. In addition, the BSA lacks suitable pool habitat and sufficient water levels during the breeding season for foothill yellow-legged frog; therefore, it does not contain suitable breeding habitat for this species. The BSA also lacks suitable basking and upland habitats for Pacific pond turtle. The lack of nearby occurrences and suitable habitat within the BSA make it unlikely special-status amphibian and reptile species would occur within the BSA; thus, the proposed project would have no effect on foothill yellow-legged frog, California red-legged frog, or Pacific pond turtle.

Based on the habitat conditions present on the BSA and documented range and occurrence information for special-status wildlife species (CDFW 2016), it was determined that in addition to steelhead, the BSA contains potential habitat for six other special-status or protected wildlife species including: Allen's hummingbird (*Selasphorus sasin*), rufous hummingbird (*Selasphorus rufus*), purple martin (*Progne subis*), olive-sided flycatcher (*Contopus cooperi*), oak titmouse (*Baeolophus inornatus*), and Nuttall's woodpecker (*Picoides nuttallii*). The BSA also has potential to support non-special-status breeding birds. These species and their potential for occurrence in the BSA are discussed in further detail below.

STEELHEAD, CRITICAL HABITAT, AND FISH PASSAGE

The CCC steelhead Distinct Population Segment (DPS) is federally threatened. This steelhead DPS includes all naturally spawned populations of steelhead and their progeny in California streams from the Russian River to Aptos Creek and the drainages of the San Francisco and San Pablo bays eastward to and including the Napa River, excluding the Sacramento-San Joaquin River Basin.

Steelhead typically migrate to marine waters after spending 2 years (although up to 7) in freshwater. They then reside in marine waters for 2 to 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Steelhead adults typically spawn between December and June. In California, females generally spawn two times before they die. Preferred spawning habitat for steelhead is composed of perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast-flowing water. Abundant riffle areas with gravel or cobble substrate for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. The resident life form of steelhead is called rainbow trout, and are also protected in anadromous streams.

Survey Results

San Anselmo Creek is a tributary of the San Francisco Bay and is designated as critical habitat for both Coho salmon and the Central California Coast Steelhead DPS (70 FR 52488). Currently, Coho salmon are considered extirpated from the waters and tributaries of San Francisco Bay, therefore the species is not present within San Anselmo Creek (Brown and Moyle 1991, NMFS 2012). Steelhead are considered present within San Anselmo Creek and may be present throughout the year, in all life stages.

Within the BSA, San Anselmo Creek is primarily slow riffle habitat with substrate composed of gravels and cobble. During the April 1, 2015 site visit, depths of the creek averaged approximately 3-5 inches and widths varied from 2-10 feet. Channel slope in the BSA is gradual and no deep pools are present. However, deep pools are present at the upstream and downstream end of the BSA, greater than 50 feet from the proposed project impacts and footprint. Pool habitat above and below the BSA was approximately 12-30 inches deep at the time of the site visit. No impediments to fish passage such as plunge pools, culverts, structures or large substrate were present within the BSA.

Fish passage downstream of the BSA has been improved in recent years with the retrofit of the Center Avenue box culvert in 2012 (CEMAR 2012). However, two barriers remain downstream in the form of sub-standard Denil fish ladders. In 2006, Ross Taylor and Associates performed a functional analysis of the ladders at Saunders Avenue and Pastori Avenue. The ladder at Saunders Avenue was classified as a total barrier, while Pastori was classified as a partial barrier. The ladder at Saunders Avenue does not meet required Denil fish ladder criteria and has a 42 foot long concrete flume below the ladder which impedes the approach to the ladder (Taylor and Associates 2006). The ladder at Pastori was determined to have a flow capacity and ladder slope which make the ladder unusable by fish during many flow conditions (Taylor and Associates 2006). The combination of these two barriers limits fish passage below the BSA. Assessments for the removal or modification of both of these barriers have been completed and await funding and permitting through the group, Friends of Corte Madera Creek (FOCMCW 2015). San Anselmo Creek is still considered anadromous because the barriers only prevent passage during portions of the year when flows are inappropriate for fish passage.

Avoidance and Minimization Efforts

Habitat in the BSA is within critical habitat for both Coho salmon and steelhead. As mentioned above, while Coho salmon are considered extirpated, steelhead are considered present. In addition to the measures identified for the Perennial Stream Biological Community; the following measures would be implemented to avoid and minimize potential proposed project impacts to steelhead, critical habitat for steelhead and Coho Salmon, and EFH.

- Consultation with NMFS will be conducted to ensure proposed project design would not result in a permanent adverse effect to steelhead or critical habitat.

- Work within the channel would be conducted during the dry season (June 1 through October 31) to avoid disrupting the adult migration cycle. Work outside of this period will require consultation with NMFS.
- Work should be conducted in isolation from flowing water. Prior to the start of construction activities, the work area should be isolated, and flowing water should be diverted around the isolated area.
- A fish salvage plan will be developed prior to the onset of any in-water work. The plan will be implemented by a qualified biologist during dewatering activities in San Anselmo Creek. The fish salvage plan will include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish salvage during dewatering activities.
- The creek banks would be restored to pre-project conditions following the completion of work.
- The creek channel would be restored to the original grade using native cobble, gravel, and soils in appropriate ratios to mimic pre-project conditions.

Project Impacts

As summarized in Table 2 above, 0.005 acre (199 square feet) of permanent impacts and 0.086 acre (3,738 square feet) of temporary impacts to steelhead, critical habitat, and EFH. Critical habitat and EFH are considered Riparian Woodland, Perennial Stream, and Unvegetated Bank habitats within the BSA. Temporary, direct impacts to the creek would occur as a result of temporary dewatering and trenching within the creek bed for modifying bent footings. Infill walls would be constructed between each pair of existing columns at each of the bridge bents. Infill walls would result in the permanent fill of 0.002 acre (78 square feet) of Unvegetated Bank and Perennial Stream habitats.

Proposed project construction would result in temporary impacts to steelhead; however, no permanent adverse impacts are anticipated. The proposed project is scheduled during the time steelhead are least likely to be present and passing through the BSA, and fish salvage would be conducted to relocate any steelhead present during proposed project de-watering activities. The bridge work would add material to the existing structures but would not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream. Riprap would be placed within the riparian woodland habitat to prevent further erosion of the banks at the stormdrain outfall, and would not enter the creek bed. The stream channel and banks would be restored to near pre-project conditions following the completion of bridge work, recreating the gradient which currently exists. Restoration would use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation including creek gradient. As such, the proposed project would not change fish passage conditions and is not anticipated to impact spawning habitat. The proposed project would however result in a minor loss of habitat for this species and temporary impacts to steelhead are anticipated during project activities. Therefore, the proposed project **may affect, likely to adversely affect** steelhead and critical habitat.

The proposed project would not result in any changes to existing land use; and the BSA would be restored to conditions similar to those before the project. Therefor no indirect effects are expected.

Cumulative Impacts

No cumulative effects are anticipated from the proposed project. Downstream fish passage improvements have been recently made and the Lansdale crossing and future improvements to the Saunders and Pastori Avenue crossings are planned (FOCMCW 2015). The improvement of these structures will remove and/or improve passage over the partial barriers which currently impede anadromy during certain flow conditions. The proposed project would restore the BSA

to near pre-project conditions and allow continued fish passage. Restoration to near pre-project conditions would ensure that no barriers are created to fish passage during proposed project activities, and any improvements to downstream fish passage would not be hindered by the proposed project.

SPECIAL-STATUS AND NON-SPECIAL-STATUS NESTING BIRDS

Five special-status species of birds including: Allen's hummingbird, purple martin, olive-sided flycatcher, oak titmouse and Nuttall's woodpecker, have potential to nest within the BSA. A brief discussion on these species is provided below. In addition to the special-status bird species, non-special-status birds have the potential to nest within the BSA. Most native birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act of 1918. Under this legislation, destroying active nests, eggs, or young is illegal.

- Allen's hummingbird (*Selasphorus sasin*, USFWS Bird of Conservation Concern). Allen's hummingbird is found in a wide variety of habitats that provide nectar-producing flowers. The species is considered a common breeder throughout much of the San Francisco Bay area.

- Purple martin (*Progne subis*, CDFW Species of Special Concern). The purple martin is an uncommon summer resident in California, occurring in woodlands and low-elevation hardwood and coniferous forest. It usually feeds on insects captured in flight 100-200 feet above ground. The purple martin nests in cavities often located in tall, isolated trees or snags in open forest or woodland.

- Olive-sided flycatcher (*Contopus cooperi*, CDFW Species of Special Concern, USFWS Bird of Conservation Concern). This species if found within the coniferous forest biome, most often associated with forest openings, forest edges near natural openings (e.g. meadows, canyons, or rivers) or human-made openings (e.g., harvest units), or open to semi-open forest stands (Altman, 2000).

- Oak titmouse (*Baeolophus inornatus*, USFWS Bird of Conservation Concern). This relatively common species is year-round resident throughout much of California including most of the coastal slope, the Central Valley and the western Sierra Nevada foothills. Its primary habitat is woodland dominated by oaks. Local populations have adapted to woodlands of pines and/or junipers in some areas (Cicero 2000). The oak titmouse nests in tree cavities, usually natural cavities or those excavated by woodpeckers, though they may partially excavate their own (Cicero 2000). Seeds and arboreal invertebrates make up the birds' diet.

- Nuttall's woodpecker (*Picoides nuttallii*, USFWS Bird of Conservation Concern). Nuttall's woodpecker typically reside in lowland woodlands throughout California, west of the Sierra Nevada. This species is associated with intact oak and riparian woodlands, rarely in conifers, and is a primary cavity nester.

Survey Results

Vegetation within and surrounding the BSA may provide potential nest sites or foraging habitat for Allen's hummingbird, purple martin, olive-sided flycatcher, oak titmouse, and Nuttall's woodpecker. In addition, the bridge structure and low lying brush may support non-special-status bird nesting. Nuttall's woodpecker and oak titmouse were observed during the site visit on April 1, 2015, and one active black phoebe (*Sayornis nigricans*) nest was observed during the May 22, 2015 site visit.

Avoidance and Minimization

Although potential nesting habitat for breeding birds would not be lost as a result of the proposed project, construction could disturb active nests. The following measures would be implemented to avoid and minimize potential impacts to special-status, and non-special-status nesting bird species:

- If proposed project activities begin between February 15 and August 31, pre-construction surveys would be conducted by a qualified biologist prior to ground disturbance to determine whether active nests containing eggs, chicks, or young are present beneath the bridge and in the surrounding riparian area. Pre-construction surveys for active nests would be conducted no more than 14 days prior to ground disturbing activities.

- If active nests containing eggs, chicks, or young are not observed during pre-construction surveys, construction can proceed.

- If active nests containing eggs, chicks, or young are observed, ground-disturbing activities would be avoided within a 25- to 100-foot exclusion zone for passerine birds and a 200- to 500-foot exclusion zone for raptors and special-status species. Exclusion size would be dependent upon species and nest location. Appropriate exclusion distances will be determined by a qualified biologist based on the species present and location of the nest relative to construction activities (e.g., the nest is sufficiently shielded from construction to avoid disturbance). Construction within this buffer will be prohibited until the qualified biologist determines that the nest is no longer active. If an active nest is found after the completion of the pre-construction surveys or after construction begins, all construction activities would stop until a qualified biologist has evaluated the nest and determined an appropriate buffer to be placed around the nest. If avoidance of a buffer zone is not feasible, CDFW and/or the USFWS will be contacted to coordinate an appropriate course of action.

Project Impacts

The BSA contains potential nesting habitat for special-status and non-special-status breeding birds. Although this habitat would not be lost as a result of the proposed project, construction activities could result in direct impacts to active nests, and construction noise could result in indirect impacts to active nests. The BSA would be restored to pre-project conditions, and as such, no permanent direct impacts to nesting birds are expected.

The proposed project would not result in any changes to existing land use and the BSA would be restored to pre-project conditions; therefore, no indirect effects are expected.

Cumulative Impacts

No future public or private activities are known to be planned and or reasonably foreseen for the BSA. Therefore, cumulative effects on special-status and non-special-status nesting birds are not anticipated for this proposed project.

Chapter 5 – Conclusions and Regulatory Determinations

Federal Endangered Species Act Consultation Summary

In an email to Hugo Ahumada (Caltrans) dated June 9, 2016, Darren Howe (Natural Resource Management Specialist, NMFS North Central Coast Office) stated:

"Yes, we would expect consultation for this project type and for this reach. Reach-specific information is mixed. If you expect the reach to be wet and expect fish handling and relocation, we would expect Caltrans to request formal consultation. If you expect the reach to be dry and do not expect fish handling and relocation, we would expect Caltrans to request informal consultation."

The proposed project may affect, likely to adversely affect CCC steelhead, a federally threatened species, and designated critical habitat for CCC steelhead and Coho salmon. Therefore formal consultation is required from NMFS to assess impacts of the proposed project as well as avoidance and minimization measures used to negate impacts on steelhead and designated critical habitat for steelhead and Coho salmon. This may include establishment of work windows, a review of the proposed project design by NMFS for fish passage consideration, and compensatory mitigation. A Biological Assessment and a request for letter of concurrence will be submitted to NMFS as part of the consultation process.

The proposed project is anticipated to have no effect on northern spotted owl, a federally threatened species, or its habitat; therefore, no consultation is necessary with USFWS. Coho salmon are considered extirpated from San Francisco Bay (NMFS 2012, Brown and Moyle 1991); therefore the proposed project would have no effect on Coho salmon and consultation is not required.

Essential Fish Habitat Consultation Summary

As discussed in the previous section, the proposed project may affect designated critical habitat for steelhead and Coho salmon. Coho salmon are covered by EFH in California; however, this species is extirpated from the tributaries of San Francisco Bay and are therefore not present within San Anselmo Creek. Although no species covered under EFH are anticipated to occur, the BSA still contains habitat identified as Pacific Salmon EFH. No loss of habitat function or value is anticipated from the proposed project. The proposed project is not anticipated to adversely affect EFH and permanent project impacts would be negligible.

California Endangered Species Act Consultation Summary

California state-listed species do not have potential to occur within the BSA. No take of state-listed species is anticipated to occur during the proposed project; therefore, consultation in relation to the California Endangered Species Act is not necessary for this proposed project.

Wetlands and Other Waters Coordination Summary

As summarized in Table 2 above, less than 0.001 acre (20 square feet, approximately 25 linear feet) of permanent impacts and 0.075 acre (3,265 square feet, approximately 275 linear feet) of temporary impacts to potentially jurisdictional "other waters" (creek bed) are proposed. Less than 0.001 acre (22 ft^2) of temporary impacts and no permanent impacts to wetlands are proposed. A preliminary Jurisdictional Determination will be submitted to the USACE for verification. The permits that will be required include a Streambed Alteration Agreement (CFGC 1602), CWA 401 certification (RWQCB), and CWA 404 Nationwide Permit 3 (Maintenance) or

14 (Linear Transportation Projects) (USACE). In June 2015, CDFW and RWQCB indicated that compensatory mitigation would be required. The USACE will likely agree that it is required.

Invasive Species

With implementation of the avoidance and minimization efforts in Section 3, the proposed project would not result in severe infestations of invasive plant species or spread of the New Zealand mud snail.

Other

Migratory Bird Treaty Act. Although potential nesting habitat for breeding birds would not be lost as a result of the proposed project, construction could result in temporary impacts if active nests are disturbed. Measures including preconstruction surveys and establishment of buffers if active nests are found will ensure that the proposed project would not affect nesting birds.

Chapter 6 – References

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Appendix A – Plant and Wildlife Species Observed during the Site Visits

Appendix B: Plant and Wildlife Species Observed During the Creek Road Bridge Fieldwork on November 17, 2014, and January 16, March 16, April 1, and April 17, 2015 at the BSA

Family	Scientific Name	Common Name
Other		
moss	*Syntrichia princeps*	prince of mosses
Polypodiaceae	*Polypodium californicum*	California polypody
Pteridaceae	*Adiantum jordanii*	California maidenhair fern
Woodsiaceae	*Athyrium filix-femina*	lady fern
Eudicots		
Anacardiaceae	*Toxicodendron diversilobum*	poison oak
Apiaceae	*Foeniculum vulgare*	fennel
Apiaceae	*Scandix pectin-veneris*	Venus' needle
Apocynaceae	*Vinca major*	big leaf periwinkle
Araliaceae	*Hedera helix*	English ivy
Asteraceae	*Baccharis pilularis*	coyote brush
Asteraceae	*Carduus pycnocephalus*	Italian thistle
Asteraceae	*Cirsium vulgare*	bull thistle
Asteraceae	*Helminthotheca echioides*	bristly ox-tongue
Asteraceae	*Taraxacum officinale*	common dandelion
Betulaceae	*Alnus rhombifolia*	white alder
Boraginaceae	*Myosotis latifolia*	broadleaf forget me not
Caryophyllaceae	*Stellaria media*	common chickweed
Cucurbitaceae	*Marah fabacea*	California man-root
Euphorbiaceae	*Euphorbia peplus*	petty spurge
Fabaceae	*Genista monspessulana*	French broom
Fabaceae	*Hoita macrostachya?*	leather root
Fabaceae	*Lathyrus sp. (hirsutus?)*	pea
Fabaceae	*Trifolium dubium*	little hop clover
Fabaceae	*Vicia sativa* ssp. *nigra*	narrow leaved vetch
Geraniaceae	*Erodium botrys*	storks bill
Geraniaceae	*Erodium cicutarium*	storks bill
Geraniaceae	*Erodium moschatum?*	California filigree
Geraniaceae	*Geranium dissectum*	cut leaf geranium
Juglandaceae	*Juglans californica*	CA black walnut
Lamiaceae	*Mentha spicata*	spearmint
Lamiaceae	*Stachys rigida* var. *querectorum*	hedge-nettle
Lauraceae	*Umbellularia californica*	California bay
Montiaceae	*Claytonia perfoliata*	miners lettuce
Moraceae	*Ficus carica*	edible fig

Family	Scientific Name	Common Name
Oxalidaceae	*Oxalis incarnata*	crimson wood sorrel
Oxalidaceae	*Oxalis pes-carpe*	Bermuda buttercup
Papaveraceae	*Fumaria capreolata*	white ramping fumitory
Phrymaceae	*Mimulus guttatus*.	monkeyflower
Plantaginaceae	*Plantago lanceolata*	English plantain
Polygonaceae	*Rumex obtusifolius* (?)	bitterdock
Rosaceae	*Amelanchier utahensi*s	service berry
Rosaceae	*Malus* sp.	apple
Rosaceae	*Prunus* sp.	prunus
Rosaceae	*Pyracantha* sp.	firethorn
Rosaceae	*Rosa* sp.	rose (escaped landscape planting?)
Rosaceae	*Rubus armeniacus*	Himalayan blackberry
Rosaceae	*Rubus ursinus*	California blackberry
Rubiaceae	*Galium aparine*	goosegrass
Salicaceae	*Salix lasiolepis*	arroyo willow
Sapindaceae	*Acer macrophyllum*	big leaf maple
Sapindaceae	*Aesculus californica*	buckeye
Scrophulariaceae	*Scrophularia californica*	bee plant
Urticaceae	*Urtica dioica*	stinging nettle
Verbenaceae	*Phyla nodiflora*	lippia
Monocots		
Alliaceae	*Allium triquetrum*	Three-cornered leek
Araceae	*Zantedeschia aethiopica*	calla-lily
Cyperaceae	*Carex nudata*	torrent sedge
Cyperaceae	*Cyperus eragrostis*	tall flat sedge
Iridaceae	Chasmanthe aethiopica	coral lily (landscape plant)
Juncaceae	*Juncus articus* var. *balticus*	Baltic rush
Poaceae	*Avena fatua*	wild oat
Poaceae	*Bromus* sp.	brome
Poaceae	*Bromus diandrus*	ripgut brome
Poaceae	*Ehrharta erecta*	panic veldtgrass
Poaceae	*Hordeum murinum* sp. *murinum*	wall barley
Poaceae	*Phalaris canariensis*	canary reedgrass
Poaceae	*Festuca myuros*	rattail grass
Poaceae	*Festuca perennis*	perennial ryegrass
Wildlife		
Birds	*Melanerpes formicivorus*	acorn woodpecker
Birds	*Butorides virescens*	green heron

Family	Scientific Name	Common Name
Birds	*Sayornis nigricans*	black phoebe
Birds	*Baeolophus inornatus*	oak titmouse
Birds	*Aphelocoma californica*	Western scrub jay
Birds	*Corvus brachyrhynchos*	American crow
Birds	*Picoides nuttallii*	Nuttall's woodpecker
Mammals	*Sciurus griseus*	Western gray squirrel
Mammals	*Odocoileus hemionus columbianus*	black-tail deer
Mammals	*Felis catus*	feral cat
Invertebrates	*Potamopyrgus antipodarum*	New Zealand mud snail

Appendix B – USFWS Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
FEDERAL BUILDING, 2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
PHONE: (916)414-6600 FAX: (916)414-6713

Consultation Code: 08ESMF00-2016-SLI-1747 June 28, 2016
Event Code: 08ESMF00-2016-E-03796
Project Name: Creek Road Bridge Seismic Retrofit Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2)

of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

Official Species List

Provided by:

Sacramento Fish and Wildlife Office
FEDERAL BUILDING
2800 COTTAGE WAY, ROOM W-2605
SACRAMENTO, CA 95825
(916) 414-6600

Consultation Code: 08ESMF00-2016-SLI-1747
Event Code: 08ESMF00-2016-E-03796

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Name: Creek Road Bridge Seismic Retrofit Project
Project Description: Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek, in the Town of Fairfax, California was constructed in 1929. The bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the Maximum Credible Earthquake (MCE), potentially resulting in the loss of life. Retrofit concepts and costs to address the bridge's seismic deficiencies were presented in a Seismic Retrofit Report submitted to Caltrans. For retrofit repairs, Caltrans approved Alternate 2 of the Seismic Retrofit Strategy Report. Retrofit work involves construction of infill walls, repairing columns and bent caps, repairing of the deck surface, and abutment stabilization from the roadway side of the bridge (outside of the creek bed). Work will be conducting during one dry season only (April 15 - October 15).

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-122.59118914604186 37.98331859179023, -122.59099602699278 37.98307335691309, -122.59051859378816 37.9831663771354, -122.59060442447662 37.98334818904755, -122.59118914604186 37.98331859179023)))

Project Counties: Marin, CA

Endangered Species Act Species List

There are a total of 18 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Amphibians	**Status**	**Has Critical Habitat**	**Condition(s)**
California red-legged frog *(Rana draytonii)* Population: Entire	Threatened	Final designated	
Birds			
California Clapper rail *(Rallus longirostris obsoletus)* Population: Entire	Endangered		
California Least tern *(Sterna antillarum browni)*	Endangered		
Marbled murrelet *(Brachyramphus marmoratus)* Population: CA, OR, WA	Threatened	Final designated	
Northern Spotted owl *(Strix occidentalis caurina)* Population: Entire	Threatened	Final designated	
Short-Tailed albatross *(Phoebastria (=diomedea) albatrus)* Population: Entire	Endangered		

western snowy plover *(Charadrius nivosus ssp. nivosus)* Population: Pacific coastal pop.	Threatened	Final designated	
Fishes			
Delta smelt *(Hypomesus transpacificus)* Population: Entire	Threatened	Final designated	
steelhead *(Oncorhynchus (=salmo) mykiss)* Population: Northern California DPS	Threatened	Final designated	
Tidewater goby *(Eucyclogobius newberryi)* Population: Entire	Endangered	Final designated	
Flowering Plants			
Marin dwarf-flax *(Hesperolinon congestum)*	Threatened		
Santa Cruz tarplant *(Holocarpha macradenia)*	Threatened	Final designated	
Showy Indian clover *(Trifolium amoenum)*	Endangered		
White-Rayed pentachaeta *(Pentachaeta bellidiflora)*	Endangered		
Insects			
Mission Blue butterfly *(Icaricia icarioides missionensis)* Population: Entire	Endangered		
Myrtle's Silverspot butterfly *(Speyeria zerene myrtleae)*	Endangered		

Population: Entire			
San Bruno Elfin butterfly *(Callophrys mossii bayensis)* Population: Entire	Endangered		
Mammals			
Salt Marsh Harvest mouse *(Reithrodontomys raviventris)* Population: wherever found	Endangered		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix C – Preparers Qualifications

Kelly Biological Consulting
5San Anselmo, CA 94960
(415) 482-9703

P.O. Box 1625
Truckee, CA 96160
(530) 582-9713

CAPABILITIES

Kelly Biological Consulting is a WBE certified, small business experienced in conducting wetland delineations and special status plant surveys, creating vegetation maps, preparing permits, mitigation plans, and the vegetation sections of CEQA and NEPA environmental documents. The firm's primary goals are responding to client needs and providing top quality work using the knowledge that comes from years of experience. Kelly Biological Consulting subcontracts wildlife and fisheries biologists to offer a full range of biological services.

PRINCIPAL

Micki Kelly, Principal, Plant Ecologist
Professional Wetland Scientist (Certification #001007)

- Experienced in conducting plant surveys and wetland delineations in a wide variety of habitats.
- Managed the wetland permitting tasks for construction of a gas transmission line that crossed over 200 wetlands and "other waters" in California, Oregon, and Nevada. Negotiated with 3 U.S. Army Corps of Engineers Districts, 5 Regional Water Quality Control Boards, and other agencies pursuant to the Clean Water Act Sections 401, 402, and 404, and the Porter Cologne Act.
- Taught plant identification and ecology for the U.S. Army Corps of Engineers wetland delineation 40-hour training program. Also taught a class in Sierra Nevada flora and special status plants.
- Designed and implemented a monitoring plan that provided accurate comprehensive data while controlling costs for the 230-mile Tuscarora Gas Transmission Line and the 164-mile Alturas Intertie Project.
- Developed and implemented two large-scale off-site wetland mitigation areas.
- Received written commendation from the U.S. Army Corps of Engineers and California Department of Fish and Wildlife on a wetland permit and mitigation plan for a project in the Sierra foothills involving a Section 7 consultation.

Ms. Kelly has 25 years of relevant experience, successfully managing multi-faceted projects with wetland and endangered species issues, supervising staff and subcontractors. She completes projects on time and within budget. She studied plant ecology, taxonomy, and statistics at the University of Michigan, San Francisco State University, and the University of California, Berkeley. She has taught plant identification and ecology for the U.S. Army Corps of Engineers wetland delineation 40-hour training program. Prior to establishing Kelly Biological Consulting in 1994, she worked as a plant ecologist for WRA, CH2MHill, and Harding Lawson Associates.

Ms. Kelly has conducted sensitive plant species surveys and written impact and mitigation texts for California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents and as well as baseline information on restoration sites. She is experienced in designing sensitive plant surveys in accordance with the current California Native Plant Society and the California Department of Fish and Wildlife guidelines. She has conducted vegetation studies in habitats ranging from coastal salt marsh to foothill riparian and montane meadows in California and Nevada. She has extensive experience in designing suitable search patterns based on the desired level of intensity. Ms. Kelly has prepared biological assessments and developed special status plant mitigation and monitoring plans requiring substantial understanding of plant ecology.

Ms. Kelly has performed wetland assessments and delineations on numerous projects including complex filled and excavated problem wetlands, montane areas, farmed wetlands, two diked historic salt marshes that were over 1,000 acres, numerous small emergent wetlands, several 2,000+ acre sites in the Sierra Nevada, alkali playas, foothill riparian zones, and coastal salt marsh restoration sites. Ms. Kelly has expertise in Army Corps of Engineers approved sampling techniques and the data analysis that is used in performing routine and comprehensive delineation. She has developed and implemented wetland monitoring plans using the techniques currently known to be the most successful in wetland mitigation design and construction.

Ms. Kelly has extensive experience in the legal aspects of sensitive species and wetland protection. She has authored Army Corps of Engineers Permits involving Section 7 consultations, one of which received written commendation from the Army Corps of Engineers and Department of Fish and Game.

EDUCATION

BS Botany, University of Michigan
Graduate studies, University of California Berkeley and San Francisco State University

PROFESSIONAL SOCIETIES

Society of Wetland Scientists, Certified Professional Wetland Scientist
California Native Plant Society, Past Marin Chapter Board Member (8 years)
Society for Ecological Restoration
California Botanical Society
California Native Grass Association
California Invasive Plant Council (Cal-IPC)

REPRESENTATIVE PROJECTS

Project: Central Marin Police Station, Larkspur, CA
Client: Central Marin Police Authority

The Twin Cites Police Authority was planning to rebuild their police station when concerns about the existing storm drain outfalls and bank stability arose. Initial building construction was pending. Therefore, the first challenge was obtaining the federal and state permits quickly, even though sensitive brackish marsh habitat was adjacent to the site. Kelly Biological Consulting was able to conduct the wetland delineation and special status species surveys, and expedite the permits within the project deadlines. The second challenge was the site constraints (physical and biological). The site is on the outside bank of a ninety-degree bend in the creek, at the junction of freshwater and tidal flows. It is subject to large hydraulic forces in the winter and high salinity in the summer. In conjunction with the project geotechnical firm and the engineers, Ms. Kelly developed a restoration

design that successfully addressed the difficult site conditions. Ms. Kelly is currently conducting the wetland monitoring.

Project: Doherty Drive, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works rebuilt Doherty Drive and replaced storm drain outfall structures to address flood control and other road problems. In addition, they incorporated an NTTP bike path. One of the challenges of the project was dealing with construction within brackish marsh habitat where special status species are known to occur, while working within a tight schedule. Kelly Biological Consulting conducted a wetland delineation and botanical studies. The firm prepared the permit applications, and negotiated with the regulatory agencies with the goal of constructing the outfalls in a timely, cost effective manner. Construction was completed with positive reviews from the agencies.

Project: Alexander Avenue Bridge Retrofit/Rehabilitation, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works retrofitted and rehabilitated the Alexander Ave. Bridge. Kelly Biological Consulting provided pre-construction monitoring which was conducted by WRA as a subcontractor. Ms Kelly also negotiated with California Department of Fish and Wildlife regarding tree removal and planted acorns as mitigation for tree removal.

Project: Doherty Drive Bridge Replacement, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works replaced Doherty Drive Bridge. The project required construction within brackish marsh habitat and a creek where special status species are known to occur. Kelly Biological Consulting provided construction monitoring with WRA as a subcontractor. Due to schedule issues, the project required working within protected species work windows. Ms Kelly negotiated with the regulatory agencies with the goal of completing construction to avoid the additional impacts to the community that would have occurred had construction been halted until the following season.

Project: Highway Interchange, San Benito, CA
Client: Subcontractor to WRA

A proposed project required the evaluation of potential interchange alternatives. The site was near the Pajaro River. Kelly Biological Consulting conducted the special status plant surveys and contributed to preparation of the NES.

Project: Caltrans Marin Narrows Road Widening, Marin County, CA
Client: Subcontractor to WRA

Kelly Biological Consulting conducted a wetland delineation for the proposed Highway 101 widening in Marin as a subcontractor to WRA and CH2MHill. Work included field analysis, report and map preparation, and supervising WRA and CH2MHill staff. The most challenging element of the work was addressing SWANCC and Rapanos issues along a highway that had highly altered hydrology.

Project: U.S. Army Corps of Engineers Wetland Training Class, CA
Client: San Francisco State University

Ms. Kelly has taught the plant ecology portion of a wetland delineation class. The students learned the basic elements of plant identification, methods for determining wetland status, dominant species, and the wetland-upland boundary.

Information on additional projects available on request.



DANIEL CHASE, MS

Associate
Fisheries Biologist
chase@wra-ca.com
o: 415.524.7252
c: 707.363.5045

Years of Experience: 10

Education

MS, Physiology and Behavioral Biology, San Francisco State University, 2014

BS, Conservation and Resource Studies, University of California, Berkeley, 2005

Professional Affiliations/ Certifications

USFWS Recovery Permit for Tidewater Goby (TE-237061)

CDFG Scientific Collectors Permit (#8472)

Transportation Worker Identification Credential (TWIC)

American Association for the Advancement of Science

Specialized Training

40-Hour HAZWOPER Training

Fish Passage Design & Engineering Workshop, CDFG, NOAA Fisheries

Backpack Electrofishing: Principles and Practices

Freshwater Fish Identification – Biology, Ecology & Morphology

During his time with WRA, Dan has managed and worked on a diversity of fisheries and wildlife related projects including permitting, endangered species consultation, protocol level surveys, habitat evaluation and assessments, rescue and relocation, and monitoring. He has extensive experience with fisheries related issues throughout California, and currently holds a Recovery Permit from the U.S. Fish and Wildlife Service (USFWS) for tidewater goby. His technical expertise includes fisheries ecology, fish passage evaluation, geomorphic surveying, special status species surveys, habitat assessments, and eelgrass surveys. Dan's environmental work experience prior to starting with WRA includes fisheries and wildlife work in southern California, eelgrass work in Washington, and oil spill response in the Gulf of Mexico.

Dan has experience with environmental permitting including Endangered Species Act Section 7 and Essential Fish Habitat consultation, California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreements, CDFW Incidental Take Permits (2081), and biological resource assessments prepared for the California Environmental Quality Act (CEQA). His experience includes the preparation of technical documents and implementation of permit compliance, mitigation, and monitoring requirements for these permits. Dan has experience with special status species including: longfin smelt, tidewater goby, steelhead, Chinook salmon, Santa Ana sucker, unarmored threespine stickleback, California red-legged frog, California tiger salamander, burrowing owl, clapper rail, black rail, Swainson's hawk, Bay checkerspot butterfly, Callippe silverspot butterfly, pool fairy shrimp, and tadpole shrimp.

Representative Projects

County of Santa Clara, Bridge Scour Natural Environmental Studies, Santa Clara County, California

Twelve bridge locations within Santa Clara County were identified by Caltrans as having critical abutment scour necessitating repair. The Santa Clara County Roads and Airports Department, with funding from Caltrans, is completing the repairs, working with the Caltrans Office of Local Assistance. To complete these repairs, each bridge site was required to complete a Natural Environment Study (Minimal Impact) (NES MI) to evaluate the potential for impacts to biological resources, analyze permit requirements, and describe avoidance, minimization, and mitigation measures. Dan served as a lead biologist and his project work included site visits, design of mitigation and avoidance measures, and agency coordination in the preparation of the documents. Once permits were issued, including a National Marine Fisheries Service Biological Opinion, he lead fish salvage crews during dewatering activities.

Old Canyon Road Bridge Scour Repair Biological Surveys and Permitting, Fremont, California
WRA is teaming with David J. Powers & Associates and Schaaf & Wheeler to complete the environmental review and permitting studies necessary to repair scour on a bridge across Alameda Creek in Fremont, California. Alameda Creek is not currently an anadromous fish stream, but restoration will begin in 2014 to construct fish ladders and return anadromous steelhead to Alameda Creek. The Old Canyon Road Bridge currently presents a low-flow fish passage barrier due to the presence of poured concrete in the creek bed beneath the bridge. The bridge scour repair will remove the concrete and install rock protection around the bridge abutments. WRA prepared Caltrans biological resources documentation for the project and engaged with the National Marine Fisheries Service in a Technical Assistance for concurrence that the design would not be detrimental to fish passage once the downstream fish ladders had been completed. WRA worked with the project engineers to assess potential fish passage issues at the bridge and to develop plans for fish passage that meet the National Marine Fisheries Service and California Department of Fish and Wildlife standards for fish passage. Dan was the project lead fisheries biologist for WRA and was involved in the preparation of environmental documentation and resource agency permit applications.

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California
Marine vessels and barges are brought to the dry docks at the former Mare Island Naval Shipyard to be serviced and repaired. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to salvage (rescue) stranded fish from the dry dock. Dan serves as project manager and lead fisheries biologist. He is responsible for leading field crews, coordinating with resource agency personnel, ensuring permit compliance, and authoring technical reports following each salvage event. He has also led consultation meetings, prepared biological assessments for the NMFS and USFWS permits, and assisted with amending an existing CDFW permit to reduce mitigation requirements for the dry dock. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, Chinook salmon and green sturgeon at this site. This project is ongoing.

Pastori Avenue Bridge Outfall, Marin County, California
Dan served as the lead fisheries biologist for a bank stability and outfall project in San Anselmo Creek within the town of Fairfax. Project work included a multi-day fish rescue and relocation under the authorization of a NMFS Biological Opinion. Several juvenile steelhead were successfully relocated out of the work area prior to the initiation of construction. During project work, Dan identified the invasive New Zealand mudsnail in the creek, which had previously not been documented for this watershed. NMFS and CDFW were notified of the occurrence.

Caltrans Southern California Lagoon Study, San Diego County, California
California Department of Transportation is analyzing impacts and potential sources of mitigation for sensitive species and habitat for the Interstate 5 widening in San Diego County. As part of an analysis for increases in tidal inundation, Dan participated in wetland assessments and led field crews in biological assessments and topographic surveys within six coastal lagoons in northern San Diego County. During the biological assessments, several coastal California gnatcatcher pairs were identified and suitable breeding habitat for the species was mapped. The second phase of this project, which involves computer based simulation and analysis of increased tidal inundation, is ongoing.

Salmonid Habitat Assessment and Relocation in California
Dan has worked on several projects designed to assess potential habitat for salmonid species. Survey techniques include CDFG protocol level stream habitat assessment, red and carcass spawning surveys, substrate composition and permeability sampling, geomorphic surveys, water quality sampling and analysis, various forms of netting and trapping, and snorkel surveys for identification purposes. Survey work has been conducted in Napa, Sonoma, Shasta, Santa Clara, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Kern Counties.

Permanente Quarry Aquatic Baseline, Santa Clara County, California
Permanente Quarry is a 3600 acre property located in western Santa Clara County at the northern extent of the Santa Cruz Mountains. As part of the quarry's planned expansion, Dan designed and implemented a study of the habitat and aquatic fauna of two headwater creeks on the property. The following field studies were completed as part of this work: fish were surveyed by seine and visually to determine species composition, distribution and relative abundance; nocturnal time-constraint visual encounter surveys were employed to document amphibian species composition, distribution and relative abundance; benthic macroinvertebrates (BMI) were sampled at eight representative locations in accordance with the California Stream Bioassessment Procedure (CSBP). The collected BMIs were sorted by taxa and the data analyzed according to accepted metrics; and a detailed physical habitat study was conducted to quantify the condition and value of the current aquatic habitat. A technical report was completed that will serve as a baseline of the available habitat and existing fauna within the two watersheds.

Grady Ranch Creek Restoration and Permitting, Marin County, California
As part of a proposed Grady Ranch Development in Marin County, a large scale creek restoration and fish passage improvement was designed and permitted. WRA provided biological services which included fish passage assessment, habitat mapping, fisheries surveys, California red-legged frog protocol level surveys, design review, agency consultation, permitting, and the preparation of long term monitoring plans. Dan served as the lead fisheries biologist for the project, and was involved with biological surveys, fish passage assessments, habitat mapping, consultation, and prepared a biological assessment to support the projects permits. While the project never went to construction, the restoration design was the process of receiving approval from the resource agencies.

Fish Passage Assessment in California
Dan has worked with several teams on the identification and assessment of fish passage barriers for anadromous species, which involved onsite qualitative habitat analysis and quantitative data collection utilizing a Total Station Survey Instrument. His survey work and professional assessments have been used as supplemental components to technical reports and as part of a state wide database that is in process for Caltrans. Fish passage assessments have been performed in various watersheds of Marin, Contra Costa, Monterey, Santa Barbara, Ventura and Los Angeles Counties.

Santa Clara River Estuary Habitat Restoration and Enhancement Feasibility Study, Ventura County, California
A Fisheries Restoration Grant Program through CDFW funded a feasibility study and conceptual design development for the restoration of estuarine fish habitat along the Santa Clara River Estuary. Following the preparation of an existing conditions technical report, stake holder outreach and restoration designs were crafted to focus on the conversion of an existing developed campground back to higher quality estuarine habitat. The campground would then be relocated from its current footprint. Dan served as the project manager and lead biologist. His work included a habitat assessment, report preparation, design review, participation in outreach meetings, and team management. The final feasibility report for the preferred concept will be released in 2015.

Napa Dry Bypass Flood Control, Napa County, California
As part of a comprehensive flood control program for Napa County, a high flow bypass channel and creek restoration at the confluence of Napa Creek and Napa River was constructed in downtown Napa. Dan served as the project's lead fisheries biologist, which involved fish rescue and relocation, otter trawl fish sampling, fish exclusion, pile driving monitoring, and daily construction checks. He also assisted Napa County Flood Control District with a permit amendment to the project's CDFW Incidental Take Permit. The completion of the dry bypass project resulted in increased flood capacity and improved habitat conditions for special-status fish including steelhead and longfin smelt.

Marin County Public Works Fisheries Services, Marin County, California
Marin County Department of Public Works (MCDPW) underwent maintenance sediment removal at multiple culverts in West Marin. WRA provided biological support services for the sediment removal, which included pre-construction California red-legged frog surveys, environmental training, fish rescue and relocation and biological monitoring. During fish relocation, tidewater goby was encountered in an area they had not previously been documented to occur. Following the project work, WRA prepared a supplemental biological assessment of tidewater goby addressing sediment removal activities for MCDPW. Dan served as the project manager, lead fisheries biologist, and authored the supplemental biological assessment.

Callippe Preserve, Pleasanton, California
The Callippe Preserve was established as mitigation for the construction of the Pleasanton Municipal (Callippe) Golf Course. As a component of the wildlife management plan and USFWS Biological Opinion, Dan has conducted hydrological monitoring, annual sampling for California Tiger Salamander, and required predator monitoring and removal within the Preserve Conservation Areas. In 2009, Dan discovered a new population of California red-legged frog within a Preserve Conservation Area pond. Predator removal via hand capture, hook and line, gigging, shooting, and dipnet capture continued throughout 2009 and 2010. Successful breeding of California red-legged frog was confirmed in 2010. In October 2010, Dan, with approval of the USFWS and the landowner, dewatered the pond using a gasoline-powered trash-pump to rid it of bass and bullfrogs. Monitoring is ongoing, however California red-legged frog breeding success is expected to improve in 2012. In the fall of 2013, non-native predatory fish were detected in the golf course irrigation ponds. Dan assisted with draining the ponds and eradicate the fish in compliance with the USFWS Biological Opinion and associated management plans. Dan assisted with the captured and retention of 22 CRLF during the dewatering. CRLF were released back into the irrigation ponds as soon as refilling resumed.

Frenchman's Creek Water District, San Mateo County, California
Frenchman's Creek Water District (FCWD) is a small water service provider located north of Half Moon Bay along coastal San Mateo County. A CDFW 1602 permit allows for the temporary installation of a flashboard dam and water withdrawal from the system. Dan serves as the fisheries biologist for this project and the FCWD, which involves monitoring flow and habitat conditions during the diversion period, permit compliance, and annual reporting. This project is currently ongoing.

Potrero Creek Restoration Carmel, California
Dan helped design, manage and implement the restoration of Potrero Creek, in the Carmel Valley, California. A large landslide altered the existing channel and was undermining a road. Dan aided with the design to restore the previous channel alignment and use the altered channel as a high water channel which would provide rearing habitat for steelhead and California red-legged frog. He conducted environmental training for the workers, pre and post restoration geomorphic surveys, served as the onsite biological monitor and restoration manager during construction, and assisted with the permitting of the project.

Draper Inverness Dock Permitting, Marin County, California
In accordance with permit requirements of USFWS and NMFS, Dan performed pre-construction eelgrass surveys at a dock replacement project in Tomales Bay. Dan also performed daily construction monitoring for all inwater work, conducted environmental sensitivity training to on-site construction staff, and monitored environmental permit compliance for the project. Construction involved removal of creosote piles and installation of eelgrass friendly deck grating that allows light to penetrate beneath it. Following the construction of the dock, Dan led annual monitoring work to document the project effect on the eelgrass bed. Monitoring was completed in 2012 when the eelgrass bed was confirmed to have recovered to pre-construction conditions.



PATRICIA VALCARCEL, MS

Wildlife Biologist

valcarel@wra-ca.com

o: 415.454.8868 x1220

Years of Experience: 9

Education

MS, Wildlife Sciences, Oregon State University, 2011

BA, Environmental Sciences, Northwestern University, 2003

Professional Affiliations/ Certifications

USFWS Recovery Permit for giant gartersnake and San Francisco gartersnake (TE-64146A)

California Department of Fish and Wildlife Scientific Collecting Permit

The Wildlife Society

Specialized Training

- Biology and Management of the Alameda Striped Racer, Alameda County Conservation Partnership, May 2014
- San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques, Central Coast Chapter of The Wildlife Society, Summer 2013
- Swainson's Hawks in California's Central Valley, Sacramento-Shasta Chapter of The Wildlife Society, Spring 2012
- Workshop on the Biology and Conservation of the California Tiger Salamander, Alameda County Conservation Partnership, June 2012
- Amphibian Inventory and Monitoring Protocol, Northwest Partners in Amphibian and Reptile Conservation, Spring 2011

Patricia Valcarcel earned a MS in Wildlife Sciences while conducting research on the spatial ecology of the threatened giant gartersnake. She has worked on a variety of field research projects ranging from animal movements to behavior and reproduction. She has presented her work at many conferences and published in peer-reviewed journals.

Patricia has extensive experience working with giant gartersnakes in the Sacramento Valley and assisted with mark-recapture surveys for San Francisco gartersnakes in San Mateo County. She has performed surveys and other activities related to California red-legged frog in Alameda, San Mateo, Los Angeles, Solano, and Sonoma Counties. Patricia also has extensive experience throughout California's Central Valley including protocol-level surveys for Swainson's hawk, burrowing owl, and assessments for San Joaquin kit fox and blunt-nosed leopard lizard. In addition, she has conducted observations and coordinated compliance for Pacific herring spawning in San Francisco Bay.

Patricia's primary responsibilities are to conduct surveys, habitat assessments, and write associated biological assessment and technical reports for special-status wildlife species. She has experience with the San Joaquin County Multi-Species Habitat Conservation Plan as one of the on-call biologists for the San Joaquin Council of Governments. In addition, Patricia is involved in environmental permitting, permit compliance, and mitigation and monitoring efforts associated with these permits.

Representative Projects

East Bay Municipal Utility District Mokelumne Aqueduct Project, San Joaquin County, California 2012 – 2013

Recoating of the Mokelumne Aqueduct Phase 8 – Slough Crossing Project will be conducted at four project sites located in San Joaquin and Contra Costa counties. In accordance with permits, a USFWS-approved giant gartersnake biologist is needed to perform pre-construction surveys and compliance monitoring. Patricia holds a USFWS Recovery Permit for giant gartersnake and was approved to perform the pre-construction surveys. She also monitored a Swainson's hawk nest within the Project Area to confirm nesting status of the pair and EBMUD compliance with avoidance measures.

San Joaquin Council of Governments, San Joaquin County, California 2012 – Present

WRA is contracted for on-call services related to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). Patricia has performed pre-construction surveys and recommended avoidance and minimization measures to ensure participants are in compliance with the SJMSCP. Wildlife species and habitats Patricia has encountered as part of this work include burrowing owl, California tiger salamander, and Swainson's hawk. In addition, Patricia prepared and consulted with the California Department of Fish and Wildlife on a burrowing owl exclusion plan. Following approval by CDFW, Patricia implemented the exclusion and monitoring plan.

Ridge Top Ranch Wildlife Conservation Bank, Solano County, California 2012 – 2015
WRA and Ridge Top Ranch, LLC (RTR) are in the process of developing over 280 acres of high quality California red-legged frog and callippe silverspot butterfly mitigation habitat located within Solano County, California. WRA, in consultation with the USFWs and under 10(a)(1)(A) Recovery Permit TE-212445-0, successfully translocated California red-legged frogs to created habitat within the RTR Wildlife Conservation Bank. WRA has been involved throughout the process, from selecting donor sites and planning habitat creation, to translocation of egg masses and monitoring the frogs to ensure that establishment at the receiving site was successful. Through the monitoring phase, Patricia assisted permit-holder Rob Schell in survey efforts, which included egg mass surveys at the donor site, visual counts at the receiving ponds, as well as the capture and handling of juvenile red-legged frogs to measure and install PIT tags. She also conducted a Callippe silverspot butterfly survey as part of annual monitoring efforts. Monitoring at this site is ongoing, and the Conservation Bank is in the final permitting stages.

Napa Valley Marina Permitting and Dredge Monitoring, Napa, California 2012 – Present
The Napa Valley Marina is an active recreational marina along the Napa River near Bull Island. Maintenance dredging of the Marina is necessary for boat access to and from the Napa River. Patricia is involved with a variety of environmental consulting services for the maintenance dredging including preparation of applications for the Dredged Materials Management Office (DMMO) and the California Department of Fish and Wildlife Streambed Alteration Agreement. Maintenance dredging permits included monitoring for special-status species and habitat conditions such as temperature and salinity monitoring for longfin smelt. Patricia oversees monitoring and compliance surveys for the multi-year maintenance dredging project.

Port of Richmond Inner Harbor Maintenance Dredging, Richmond, California 2014 – 2015
Maintenance dredging of the Port of Richmond Inner Harbor Channel was necessary to maintain passageways for the active port. The Pacific herring is a protected fishery, and dredging operations within the Pacific herring spawning season were unavoidable. Patricia was a California Department of Fish and Wildlife approved observer for the Project, and she coordinated a team of observers for the maintenance dredging Project. One spawning event occurred within the Project Area during dredging activities and Patricia consulted with CDFW to establish buffers. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

Bruno's Island Bridge Repair Project, Southwestern Sacramento County, California 2014
Bruno's Island is a small recreational boat harbor located off Andrus Island along the San Joaquin River in the western Delta. Bridge repair activities included sheathing piles within the channel and could potentially affect listed aquatic species. Patricia provided the hydroacoustic analysis and wrote the Section 7 Biological Assessment for Delta smelt, steelhead, and giant gartersnake. Through her work and advising on project design such as strike limits and use of bubble curtains outside of the work windows, a "Not Likely to Adversely Affect" was received from both NMFS and USFWS. This Project was completed in 2014.

12 Bridges, Santa Clara County, California 2012 – 2013
WRA was engaged by the County to prepare Natural Environment Study (Minimal Impact) reports, permitting documents, and Revegetation and Monitoring Plans for twelve bridges with critical abutment scour located throughout Santa Clara County, California. Patricia aided in the preparation of the Section 7 Biological Assessments for six of the bridges which incorporated California red-legged frog, California tiger salamander, Least Bell's vireo, and salmonid species. Based on those plans, she has conducted the pre-construction surveys and biological monitoring required by the U.S. Fish and Wildlife Service Biological Opinion in 2012 and 2013 work seasons.

Burrowing Owl Surveys and Passive Exclusion, Legacy on 101, San Jose, California 2014
The Legacy on 101 project is a 16.35 acre property in Santa Clara, California that is to be developed into two 6-story industrial park/office/R&D buildings. The area is known to support burrowing owl, and a series of take avoidance surveys was conducted from 2008 to 2014. Patricia observed one burrowing owl occupying the property in 2014. Patricia developed the exclusion and monitoring plan submitted to CDFW. During the non-nesting season, she passively excluded the owl and excavated all potential burrows at the site. Patricia conducted monitoring at the site every other week until construction activities were initiated and performed a pre-construction survey immediately prior to grading, per the exclusion plan.

Napa Dry Bypass, Napa, California 2014
The Napa Dry Bypass is designed to divert 100 year flows around the oxbow reach to avoid flooding the Soscol Gateway area in downtown Napa. Patricia is a CDFW-approved biologist for this Project, and Patricia has been involved with this project by monitoring compliance and construction activities during excavations of the new river channel, as well as assisting with fish rescues within the coffer dams. Project permits include Biological Opinions from National Marine Fisheries Service and California Department of Fish and Wildlife Incidental Take Permits for steelhead (Central California Coast DPS), Delta smelt, and longfin smelt.

Marin County Department of Public Works Flood Control Line Replacement, San Rafael, California 2013
The Marin County Department of Public Works manages flood control projects throughout the county, including the city of San Rafael. The project consists of replacing an aging flood diversion pipe in a low-lying residential area adjacent to the south fork of Gallinas Creek. The project area is located in a salt marsh slough and has known populations of California clapper rail and salt-marsh harvest mouse. Patricia was a USFWS-approved biological monitor for the project and has monitored construction to ensure compliance with the project's regulatory permits. Several California clapper rails were observed at short range and within the project area, and Patricia stopped work activities until the birds had safely left of the own volition.

Fitzgerald Marine Reserve Coastal Trail, San Mateo County, California 2012 – 2013
The Fitzgerald Marine Reserve project includes the design of a portion of the California Coastal Trail in San Mateo County, California. Major components of the project, in addition to the multi-use trail, included a free span pedestrian bridge and improved beach access and overlook. WRA provided environmental services in support of the proposed trail and public access improvements, and existing sensitive habitats were avoided to the extent possible in the public access design. WRA prepared the conceptual designs for the trail and improved access to the overlook and beach, performed wetland delineations, completed biological surveys, and prepared permit applications. As part of this process, Patricia was approved by the U.S. Fish and Wildlife Service under the Biological Opinion for the project to perform the pre-construction surveys and monitoring for San Francisco gartersnake and California red-legged frog. In addition, she provided advice on the design and materials for the wildlife exclusion fence, and oversaw its installation.



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Years of Experience: 3

Education
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Professional Affiliations/ Certifications

American Fisheries Society

Nick holds a B.S. degree in Wildlife, Fish and Conservation Biology from the University of California, Davis. His coursework included ichthyology, mammalogy, ornithology, waterfowl and wetland management, population dynamics and invasive plant ecology.

Prior to joining WRA, Nick worked as a biological monitor on a transmission line project where he gained experience working with California tiger salamander, western spadefoot toad and nesting birds. In addition, he worked for two years as a Fisheries Technician in both the private and public sector. His work primarily revolved around population monitoring, invasive species removal, water quality and habitat assessments. He has worked extensively with Lahontan cutthroat trout and native species of the Sierra Nevada Mountains. Nick has also worked with the UC Davis Museum of Wildlife and Fish Biology and performed a cursory study on small mammal distribution throughout the state of North Dakota. He conducted live-trapping and collected specimens for the museum. The data collected was presented to the museum and the Smithsonian Institute in support of follow-up studies.

With WRA, Nick conducts fish salvages, habitat assessments, biological monitoring, focused wildlife surveys, and writes biological assessment reports. He has trained with Rob Schell, a U.S. Fish and Wildlife Service Recovery Permit holder for California red-legged frog (CRLF); Jason Yakich, Recovery Permit holder for California clapper rail (CCR); and Kate Allan, Recovery Permit holder for salt marsh harvest mouse (SMHM).

Representative Projects

Amy's Kitchen, Rohnert Park, California, 2014 – Present
During construction of facilities for Amy's Kitchen in Rhonert Park, Nick was approved by CDFW as a biological monitor for California tiger salamander (CTS). During the course of the project, Nick monitored for environmental compliance at the site to assure that there was no take of covered species during construction. To date, no take of CTS has occurred.

Port of Richmond Inner Harbor Maintenance Dredging, Richmond, California 2014 – 2015
Maintenance dredging for the Port of Richmond Inner Harbor Channel was conducted in the winter of 2014 to maintain passageways for ships entering the port. Pacific herring is a protected fishery, and dredging operations within the harbor overlapped with the Pacific herring spawning season. Nick was an approved California Department of Fish and Wildlife observer for the Project. During operations, one spawning event occurred within the Project Area. Nick observed the spawning event and informed crews on the required buffers to maintain compliance. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California 2014, - Present
Mothballed vessels from the National Defense Reserve Fleet in Suisun Bay and private ships needing repair are brought to the dry docks at the former Mare Island Naval Shipyard. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to salvage (rescue) stranded fish from the dry dock. Captured fish are placed in aerated holding coolers, identified to species, counted and measured before being returned to the Mare Island Channel of the Napa River. Nick is a lead fisheries biologist for this operation. He is responsible for leading a team of biologists who conduct salvage operations. He also coordinates with resource agency personnel, ensuring permit compliance, and writes technical reports following each salvage event. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, Chinook salmon and green sturgeon at this site. This project is ongoing.

Healdsburg Veterans Memorial Dam Spillway Repair, Healdsburg, California, 2014
The Healdsburg Veterans Memorial Dam is a flashboard dam located within the city of Healdsburg on the Russian River. The dam is installed seasonally to create a temporary recreational lake. For this project, Nick was approved as the lead fisheries biologist, and biological monitor. He conducted pre-construction surveys for breeding birds as well as pacific pond turtle (PPT), and positively identified PPT in the project area. As the lead fisheries biologist he lead a team of biologists who performed multiple fish salvages within the project area following de-watering events. His team successfully identified, and safely re-located steelhead that were salvaged during the dewatering. Nick also conducted biological monitoring for PPT and special-status fish throughout the duration of the project to ensure that project activities were in compliance with agency permits. He conducted pre-construction checks, environmental trainings, and water temperature monitoring. The project was completed in compliance with relevant permits with no take of any special-status species.

Frenchman's Creek Water District, San Mateo County, 2013 - Present
Frenchman's Creek Water District (FCWD) is a small water service provider located north of Half Moon Bay along coastal San Mateo County. A CDFW 1602 permit allows for the temporary installation of a flashboard dam and water withdrawal from the system. Nick serves as a fisheries biologist for this project, which involves monitoring flow and habitat conditions for steelhead during the diversion period, permit compliance, and annual reporting. This project is currently ongoing.

Napa Dry Bypass, Napa, California, 2014 - Present
The Napa Dry Bypass is designed to divert 100 year flows around the oxbow reach of the Napa River to avoid flooding the Soscol Gateway area in downtown Napa. Nick has been approved as a lead fisheries biologist on this project and has conducted multiple fish salvage operations for longfin smelt, and steelhead. Nick also assisted in the otter trawl surveys and fish exclusion work which were required during impact hammer pile driving operations. He has also been involved with this project by monitoring compliance and construction activities including impact hammer pile driving. In addition, he assisted in the design and implementation of the environmental awareness training program to comply with both the streambed alteration agreement and incidental take permits. This project is ongoing.

Pristine Sun Solar Projects Pre-construction Surveys, California, 2014-Present
WRA was contracted to implement environmental compliance measures for several Pristine Sun projects. Projects involved creating 0.5-1 MW solar generation facilities in Glenn, and Shasta Counties. As part of these measures, Nick performed pre-construction surveys for Swainson's hawk, white-tailed kite, long-eared owl, burrowing owl, and breeding birds at two sites.

APPENDIX B. BIOLOGICAL ASSESSMENT

Creek Road Bridge Seismic Retrofit **BA**



Biological Assessment

Creek Road Bridge Seismic Retrofit

Town of Fairfax, Marin County

Bridge Number: 27C 0144

[District 4]-[MRN]-[0]-[FRFX]

STPLZ 5277 (027)

WCR-2013-145

March 2018

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Biological Assessment

Creek Road Bridge Seismic Retrofit
Town of Fairfax, Marin County
Bridge Number: 27C 0144
[District 4]-[MRN]-[0]-[FRFX]

STPLZ 5277 (027)
WCR-2013-145
March 2018

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Table of Contents

Chapter 1. **Introduction** **3**

1.1. Purpose and Need of the Proposed Action *3*

1.2. Threatened, Endangered, Proposed Threatened or Proposed Endangered Species, Critical Habitat *3*

1.3. Consultation History *5*

1.4. Description of Proposed Action *6*

Chapter 2. **Study Methods** **21**

2.1. Summary *21*

2.2. Personnel and Survey Dates *21*

2.3. Resource Agency Coordination and Professional Contacts *21*

2.4. Limitations and Assumptions That May Influence Results *22*

Chapter 3. **Environmental Baseline** **23**

3.1. Habitat Conditions in the Action Area *23*

3.2. Summary of Environmental Baseline *23*

3.3. Describe the Action Area *24*

Chapter 4. **Federally-Listed/Proposed Species and Designated Critical Habitat within Action Area** **25**

4.1. Federally-Listed/Proposed Species *25*

4.2. Discussion of Steelhead *25*

4.3. Survey Results *26*

4.4. Status of Designated Critical Habitat in the Action Area for Coho Salmon and CCC Steelhead *37*

Chapter 5. **Effects of the Project on the Action Area** **38**

5.1. Deconstruct Action *38*

5.2. Exposure to Stressors from the Action *42*

5.3. Response to the Exposure *43*

5.4. Effects of the Action *43*

5.5. Conservation Measures and Compensation Proposal *45*

5.6. Effects of Interrelated and Interdependent Actions/ Conclusions and Determination *46*

5.7. Cumulative Effects *46*

5.8. Determination *47*

Chapter 6. **Magnuson Stevens Fishery Conservation and Management Act of 1976 (as amended)** **50**

6.1. Essential Fish Habitat *50*

6.2. Managed Fisheries with Potential to Occur in the Action Area *51*

6.3. Potential Adverse Effects of Proposed Project on EFH *51*

6.4. Essential Fish Habitat Conservation Measures 52

6.5. Conclusions 53

Chapter 7. **Literature Cited 54**

Appendix A **Database Review 1**

Appendix B **Action Area Photographs 3**

Appendix C **Preparers Qualifications 5**

List of Figures

Figure 1. Project Design Plan 7
Figure 2. Action Area Location Map 13
Figure 3. Biological Communities and Map of Action Area 15
Figure 4. Effects to Biological Communities within the Action Area 39

List of Tables

Table 1. Species Considered in this analysis and determinations 3
Table 2. Federally Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Biological Study Area 27
Table 3. Direct Effects of the Proposed Action on Salmonid Critical Habitat and EFH 38
Table 4. Federally Listed Species Determined to have No Effect 47

List of Abbreviated Terms

CA	Covered Activity
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
Corps	Army Corps of Engineers
dbh	Diameter at breast height (~4 ft)
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
FHWA	Federal Highway Administration
FR	Federal Register
ft	foot/feet
km	kilometer(s)
LWD	Large woody debris
m	meter(s)
mi	mile(s)
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NOAA Fisheries	National Marine Fisheries Service
OHWM	Ordinary High Water Mark
PBO	Programmatic Biological Opinion
PM	post mile
RWQCB	Regional Water Quality Control Board
USFWS	United States Fish and Wildlife Service
USC	United States Code
USGS	United States Geological Service
WRA	WRA, Inc. Environmental Consultants

Glossary

ACTION: Any highway construction, reconstruction, rehabilitation, repair, or improvement undertaken with Federal-aid highway funds or FHWA approval.

ANADROMOUS: Refers to fish that typically inhabit seas or lakes but ascend streams to spawn; for example, salmon.

BEST MANAGEMENT PRACTICE (BMP): Any program, technology, process, operating method, measure, or device that controls, prevents, removes or reduces pollution.

COFFERDAM: Temporary watertight enclosure from which water is pumped-out to expose the bottom of a body of water and permit construction.

DIRECT EFFECTS: Effects that are caused by and action and occur at the same time and place as the action.

ENDANGERED: Plant or animal species that are in danger of extinction throughout all or a significant portion of its range.

FEDERAL HIGHWAY ADMINISTRATION (FHWA): The Federal agency within the U.S. Department of Transportation responsible for administering the Federal-aid Highway Program and the Motor Carrier Safety Program.

FEDERAL REGISTER (FR): The *Federal Register* is the official daily publication for agency rules, proposed rules, and notices of federal agencies and organizations, as well as for Executive Orders and other presidential documents.

INDIRECT EFFECTS: Effects that are caused by an action and occur later in time, or at another location, yet are reasonably foreseeable.

MAXIMUM CREDIBLE EARTHQUAKE (MCE): The maximum intensity earthquake that is assumed to occur closest to the site. This earthquake is also described as the maximum magnitude earthquake, or maximum earthquake.

MIGRATION: Intentional, directional, and usually seasonal movement of animals between two regions or habitats; involves departure and return of the same individual.

NATIONAL ENVIRONMENTAL POLICY ACT (NEPA): Enacted in 1969, NEPA requires all federal agencies to consider environmental factors through a systematic interdisciplinary approach before committing to a course of action. The NEPA process is an overall framework for the environmental evaluation of federal actions.

PROJECT (FHWA): 23 Code of Federal Regulations §1.2 defines a project as an undertaking by a State highway department for highway construction, including preliminary engineering, acquisition of rights-of-way and actual construction, or for highway planning and research, or for any other work or activity to carry out the provisions of the Federal laws for the administration of Federal-aid for highways.

RIPARIAN: Along banks of rivers and streams; riverbank forests are often called gallery forests.

RUDERAL: Disturbed area with a prevalence of introduced weedy species. Ruderal habitats are associated with unpaved highway shoulders and weedy areas around and between dwellings and other structures.

THREATENED: A species that is likely to become endangered in the foreseeable future in the absence of special protection.

TURBIDITY: Cloudiness (or a measure of the cloudiness in water due to the presence of suspended particulates).

Biological Assessment Outline for Caltrans FESA Section 7 Consultations: National Marine Fisheries Service and U.S. Fish and Wildlife Service

Executive Summary

The purpose of this biological assessment is to provide technical information and to review the proposed Creek Road Bridge (Caltrans Bridge Number 27C 0144) Seismic Retrofit Project (Action) in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The California Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), has prepared this biological assessment under its assumption of responsibility at 23 United States Code (USC) 327(a)(2)(A). The biological assessment is also prepared in accordance with 50 CFR 402, legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S.C. 1536(c)) and with FHWA and Caltrans regulation, policy and guidance. The document presents technical information upon which later decisions regarding project effects are developed.

The proposed Action **may affect, likely to adversely affect** the Steelhead; **may affect-not likely to adversely affect or modify** designated critical habitat for CCC steelhead and Coho salmon, and would have a **minor, temporary adverse effect** to Essential Fish Habitat. Formal consultation is required with the National Marine Fisheries Service (NMFS).

Chapter 1. Introduction

1.1. Purpose and Need of the Proposed Action

The purpose of the Proposed Action is to seismically retrofit the Creek Road Bridge (Caltrans Bridge No. 27C 0144) to prevent its catastrophic failure and the loss of life. The bridge is labeled as a Category 1 Bridge, implying that it would fail catastrophically under the Maximum Credible Earthquake (MCE), potentially resulting in the loss of life. The Caltrans philosophy of retrofit design for a non-lifeline facility, such as Creek Road Bridge, is to prevent its catastrophic failure and the loss of life. The bridge may sustain extensive damage, or even be inoperable after the earthquake, but must not collapse or endanger lives.

Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek, in the Town of Fairfax was constructed in 1929. The bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the MCE, potentially resulting in the loss of life. Caltrans approved Alternate 2 of the Seismic Retrofit Strategy Report.

The purpose of this biological assessment is to provide technical information and to review the Proposed Action in sufficient detail to determine to what extent the proposed project may affect threatened, endangered, or proposed species. The biological assessment is prepared in accordance with legal requirements found in Section 7 (a)(2) of the Endangered Species Act (16 U.S. C 1536(c)) and with Federal Highway Administration (FHWA) and California Department of Transportation regulation, policy and guidance. The document presents technical information upon which later decisions regarding project impacts are developed.

1.2. Threatened, Endangered, Proposed Threatened or Proposed Endangered Species, Critical Habitat

An updated species list was provided by U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) for the Action Area of the proposed project (see Appendix A). The following listed and proposed species and/or designated critical habitats were identified on the updated federal species list and were considered during this analysis:

Table 1. Species Considered in this analysis and determinations

Common Name	Scientific Name	Status	Determination
marbled murrelet	*Brachyramphus marmoratus*	T	No effect
western snowy plover	*Charadrius alexandrinus nivosus*	T	No effect

western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	T	No effect
short-tailed albatross	*Phoebastria albatrus*	E	No effect
California Ridgway's (clapper) rail	*Rallus obsoletus (longirostris) obsoletus*	E	No effect
California least tern	*Sternula antillarum browni*	E	No effect
northern spotted owl	*Strix occidentalis caurina*	T	No effect
Guadalupe fur seal	*Arctocephalus townsendi*	T	No effect
sei whale	*Balaenoptera borealis*	E	No effect
blue whale	*Balaenoptera musculus*	E	No effect
finback (=fin) whale	*Balaenoptera physalus*	E	No effect
southern sea otter	*Enhydra lutris nereis*	T	No effect
right whale	*Eubalaena (Balaena) glaciali*	E	No effect
sperm whale	*Physeter catodon (macrocephalus)*	E	No effect
salt-marsh harvest mouse	*Reithrodontomys raviventris*	E	No effect
loggerhead turtle	*Caretta caretta*	T	No effect
green sea turtle (west coast populations)	*Chelonia mydas*	T	No effect
leatherback turtle	*Dermochelys coriacea*	E	No effect
olive (Pacific) ridley sea turtle	*Lepidochelys olivacea*	T	No effect
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T	No effect
California red-legged frog	*Rana draytonii*	T	No effect
green sturgeon	*Acipenser medirostris*	T	No effect
tidewater goby	*Eucyclogobius newberryi*	E	No effect
Delta smelt	*Hypomesus transpacificus*	T	No effect
Coho salmon - central California coast Salmon	*Oncorhynchus kisutch*	E	No Effect
steelhead - central California coast	*Oncorhynchus mykiss*	T	May affect, likely to adversely affect
steelhead - central valley	*Oncorhynchus mykiss irideus*	T	No effect
Chinook salmon - central California coast	*Oncorhynchus kisutch*	E	No effect
Chinook salmon – Sacramento River winter-run	*Oncorhynchus tshawytscha*	E	No effect
Chinook salmon - Central Valley spring-run	*Oncorhynchus tshawytscha*	T	No effect
Chinook salmon - California coast	*Oncorhynchus tshawytscha*	T	No effect
longfin smelt	*Spirinchus thaleichthys*	C	No effect
eulachon	*Thaleichthys pacificus*	T	No effect
conservancy fairy shrimp	*Branchinecta conservatio*	E	No effect
robust spineflower	*Chorizanthe robusta* var. *robusta*	E	No effect
Sonoma spineflower	*Chorizanthe valida*	E	No effect

golden larkspur	*Delphinium luteum*	E	No effect
Marin western flax	*Hesperolinon congestum*	T	No effect
Santa Cruz tarplant	*Holocarpha macradenia*	T	No effect
white-rayed pentachaeta	*Pentachaeta bellidiflora*	E	No effect
showy rancheria clover	*Trifolium amoenum*	E	No effect

Candidate Species

No federal candidate species will be affected by the Proposed Action.

Critical Habitat

The Action Area is within designated critical habitat for Coho salmon (64 FR 24049) and Central California Coast steelhead (70 FR 52488).

Essential Fish Habitat

The Action Area is listed as Essential Fish Habitat (EFH) for Coho salmon and Chinook salmon (Pacific salmonids); although neither species occurs in the watershed.

1.3. Consultation History

There has been no federal Endangered Species Act Section 7 consultation with the USFWS or NMFS for the specific proposed Action.

A geotech bore was required as part of the initial design work in 2013-2014. Permit applications were submitted to the regulatory agencies. The California Department of Fish and Wildlife (CDFW) issued a letter saying that no Streambed Alteration Agreement was needed. NMFS issued a concurrence letter for the work. The U.S. Army Corps of Engineers (Corps) authorized the work. The Regional Water Quality Control Board's (RWQCB) approach was to let the 45-day window for responding expire, resulting in defacto authorization. The small geotech drilling hole was completed and backfilled.

In June 2015, the Corps, RWQCB, and CDFW were sent an email asking if compensatory mitigation would be required for the permanent impacts to "other waters" as a result of the current proposed Action. The RWQCB and CDFW responded that it would. There have been no additional agency coordination or professional contacts.

The Corps consulted with the NMFS for Routine Maintenance and Repair Activities and received a Programmatic Biological Opinion for certain defined activities dated October 18, 2013. The proposed Action does not meet the criteria for a covered activity based upon the amount of material temporarily removed below the Ordinary High Water Mark (OHWM).

1.4. Description of Proposed Action

The Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek, a structure in the Town of Fairfax, was constructed in 1929. The Town of Fairfax and Caltrans seek to seismically retrofit the bridge and prevent catastrophic failure as a result of a major earthquake.

The bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. The interior spans are simply supported on three sets of 2-column bents in the creek and the exterior spans are rigidly connected to an abutment at each end of the bridge. This configuration is one of the vulnerabilities of the bridge, and structural analyses confirmed the seismic vulnerability of the bridge. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the MCE, potentially resulting in the loss of life. The approved Seismic Retrofit Strategy is described in detail below. The Caltrans philosophy of retrofit design for a non-lifeline facility, such as Creek Road Bridge, is to prevent its catastrophic failure and the loss of life. The bridge may sustain extensive damage, or even be inoperable after the quake, but must not collapse or endanger lives.

This bridge has more than adequate waterway opening for the design floods. The above construction work may reduce the current bridge opening slightly but would not result in measureable water surface elevation rise up- or downstream of the bridge.

1.4.1. Project Summary

As part of this project description a couple of bridge terminology items should be explained. A “bent” is part of the bridge substructure and a support entity, other than an abutment. The term refers to the combination of the bridge columns, the foundation supports under the columns and the beam (bent cap) that spans the tops of the columns in the transverse direction to the bridge. The abutment is also a support, except it is located at each bridge end. The plans are provided in Figure 1.

In-water work or work below the OHWM is necessary for the Project and would only occur during Step 3, described below. For Step 4, it may be necessary to place scaffolding below the OHWM. All other steps of the proposed Action would occur outside of top of bank and OHWM. Step 5 requires disturbance to the creek bank but will be above the OHWM. To limit damage to the bank, access to the creek would be by lowering equipment, containers and materials from the bridge deck using a crane. Construction equipment would include smaller wheeled vehicles and hand-held devices. A crane, pickup trucks, dump trucks, concrete delivery trucks, small loaders, excavators and generators would be present at the project site on a daily basis. The construction vehicles would be in and out of the work area on a steady basis, but may not all be present at the same time. Storage of constructions materials, tools and vehicles would be limited to Wessen Lane and designated locations in the construction area at the level of the

Figure 1. Proposed Creek Road Bridge Plan

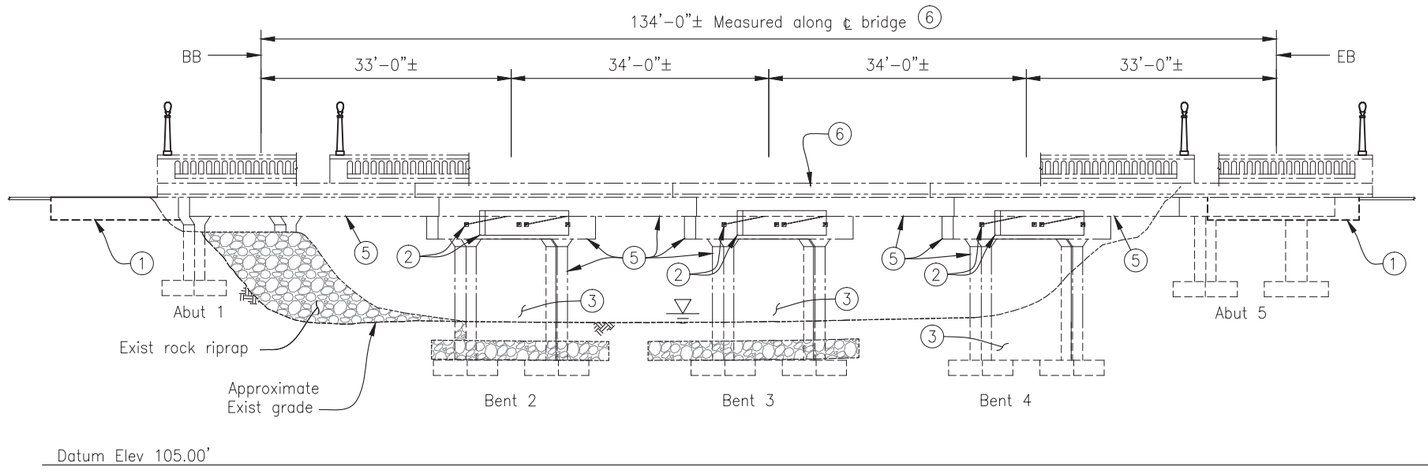
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Mrn			5	XX

REGISTERED CIVIL ENGINEER

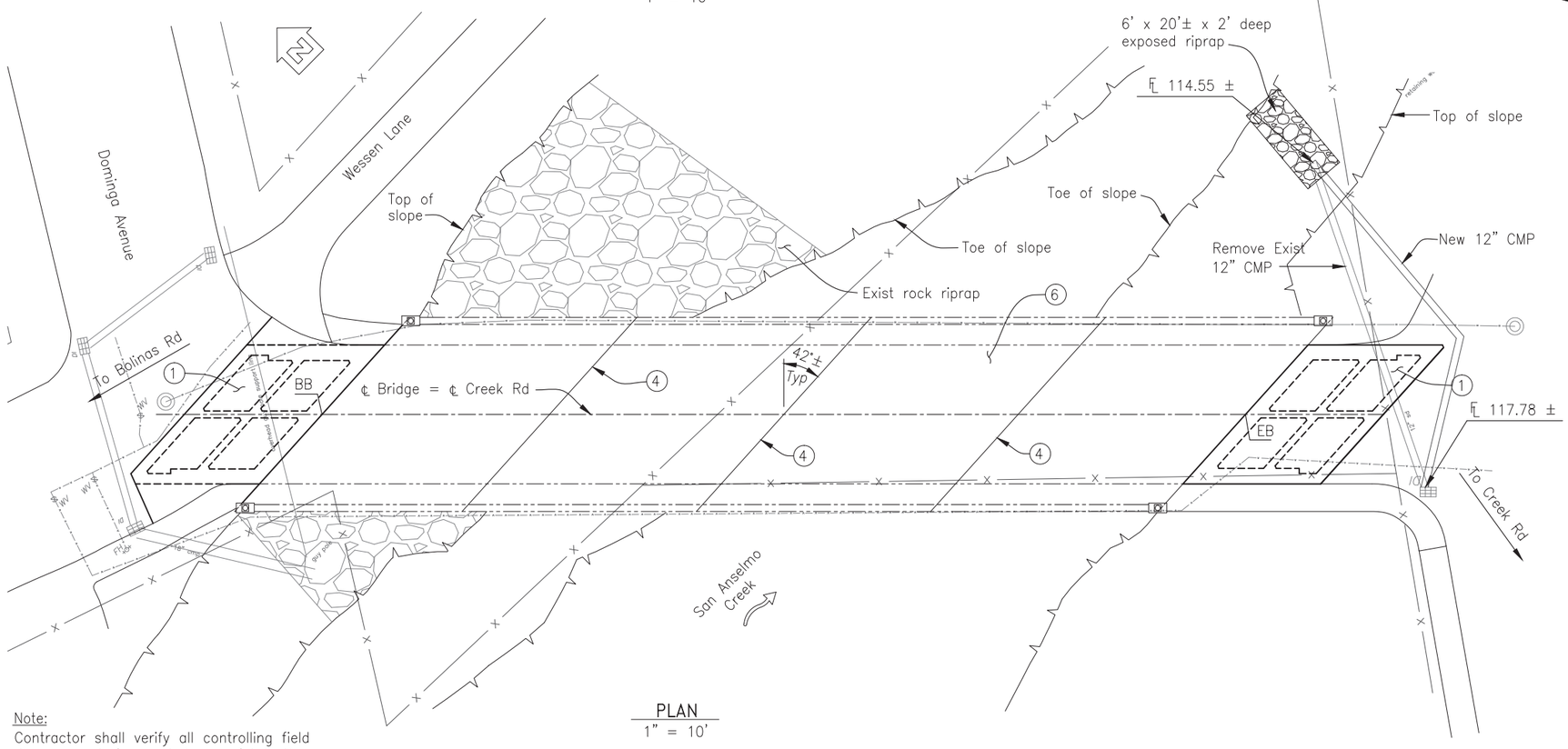
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — NADER TAMANNAIE — NO. 37289 — EXP. 6/30/16 — CIVIL — STATE OF CALIFORNIA

930 ALHAMBRA BLVD. SUITE 220
SACRAMENTO, CA 95816

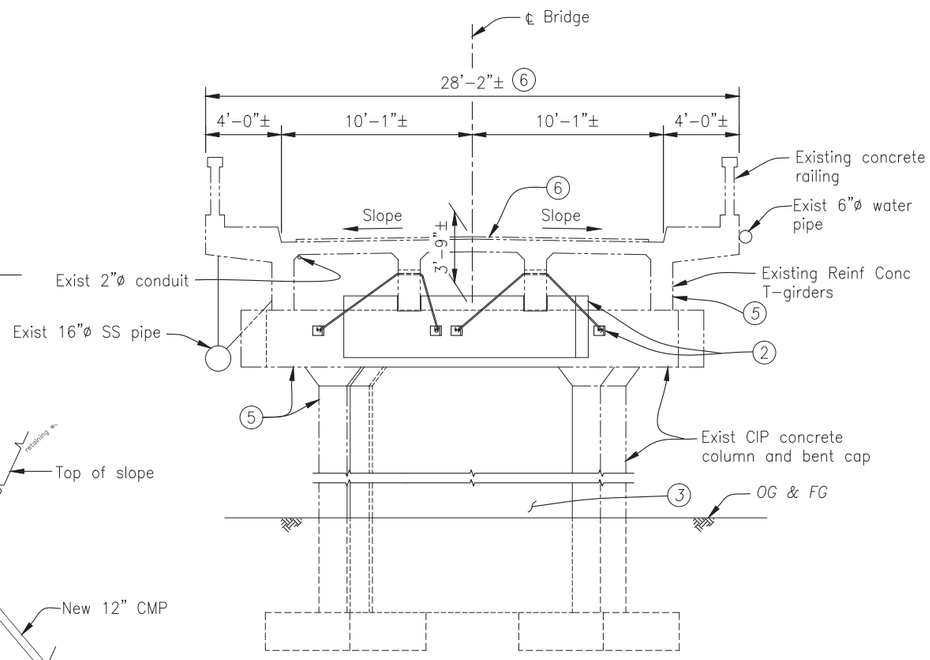


ELEVATION
1" = 10'



PLAN
1" = 10'

Note:
Contractor shall verify all controlling field dimensions before ordering or fabricating any material.



TYPICAL SECTION
1/4" = 1'-0"

RETROFIT LEGEND

1. Seismic Anchor Slab
2. Cable Restrainers and Transverse Shear Key
3. Bent Retrofit with Infill Walls
4. Repair Expansion Joint
5. Repair Spalls on Super– and Substructure
6. Remove AC and Seal with Methacrylate

Note: For Index to Plans and General Notes, see "Index to Plans" sheet.

SYMBOLS

- ——·—— Indicates Existing Structure
- ———— Indicates New Construction
- —x— Indicates Right–of–Way Limits

DESIGN OVERSIGHT	DESIGN	BY D. Vang	CHECKED	LOAD & RESISTANCE FACTOR DESIGN	LIVE LOADING: HL93 AND PERMIT DESIGN VEHICLE		
SIGNOFF DATE	DETAILS	BY D. Vang	CHECKED	LAYOUT	BY N. Tamannaie	CHECKED	
	QUANTITIES	BY	CHECKED	SPECIFICATIONS	BY	PLANS AND SPECS COMPARED	

PREPARED FOR THE
TOWN OF FAIRFAX
DEPARTMENT OF PUBLIC WORKS

Nader Tamannaie, PE
PROJECT ENGINEER

BRIDGE No. 27C–0144
POST MILE --

EARTHQUAKE RETROFIT PROJECT

CREEK RD BRIDGE OVER SAN ANSELMO CREEK

GENERAL PLAN

DS OSD 2138 (CADD 4/89)

ORIGINAL SCALE IN INCHES FOR REDUCED PLANS 0 1 2 3

CU
EA

DISREGARD PRINTS BEARING EARLIER REVISION DATES ____

REVISION DATES (PRELIMINARY STAGE ONLY)

SHEET 1 OF

road and outside of top of bank. Worker access to the creek would be over a footpath from the creek bank at either abutment.

The approved retrofit strategy requires bridge construction elements as follows:

1. Construction duration would include one permissible dry season (usually April 15 through October 15), and in-water work would occur between June 1 and October 15. Work above at the street level may be allowed outside of these work windows. The work on items 2-4 described below must take place concurrently for the in-creek work to be finished within the dry season period. Some dewatering and creek low-flow diversion through the site may be necessary. At the end of the dry season all equipment, materials and temporary access ramps would be removed from the creek and the banks and creek would be restored.

2. Close the bridge for the duration of construction and detour the traffic to other access routes.

3. Construct infill walls between each pair of columns at each of the three bridge bents in the creek as follows:

    a. A dewatering plan that protects aquatic resources would be required of the contractor, reviewed and implemented. Where needed, the flow would be diverted around the work area by building a cofferdam upstream of the location and bypassing flowing water through a diversion pipe, keeping turbidity to a minimum. It is estimated the cofferdams and water diversion would extend no more than 50 feet (ft) upstream and downstream of the work location. Best Management Practices (BMPs) filter bags and/or settling basins would be implemented to avoid the migration of the sediments or contaminants into the water flow areas or drainage systems.

    b. The soils excavated at the bridge supports (Bents 2-4), and used for backfill later on, would be lifted and stored above at the project site, likely on Wessen Lane, and not allowed to remain on the creek bed. Ground water intrusion into the work area would be pumped out into special containers, filtered and placed back in the creek. Bent excavations around the columns to cast infill walls between them would differ at each of the three locations, as follows:

        i. For Bent 4, excavate a trench to the top of the exiting footings with approximate dimensions of 16 feet (length) by 6 feet (width) by 5 feet (depth below the general creek bed). This trench would need to be fully shored on all four sides. The alternative to full shoring would be to maintain shoring facing Abutment 5 side only and lay back the other three excavated sides from the bottom up at ½:1

(horizontal to vertical) slope. In this case, the total footprint of the excavation at Bent 4 would be approximately 8 feet wide by 23 feet at the top. The choice of shoring vs. sloped sidewalls would be the Contractor's, so one may count on the larger excavation footprint.

ii. Each of Bent 2 and 3 would have riprap embedded around them below surface, requiring a different excavation scheme. At Bent 2, the fully shored excavated footprint would be approximately 30 feet by 10 feet and its bottom would be approximately 5 feet below the creek bed. Not fully shored but with the side facing Abutment 1 shored, the excavation area would be approximately 35 feet x 15 feet, which should be the footprint assumed since it is larger.

iii. At Bent 3, the fully shored excavation would be approximately 34 feet by 10 feet and 5 feet deep below the creek bed level. The fully unshored excavation, allowed at this bent, would be approximately 40 feet by 15 feet, which again may be the exposed footprint to count on. At each of Bent 2 and Bent 3 the backfill would start with a 2.5-foot thick layer of half-ton rock at the bottom and all the way to the excavation lines, and finished to the top with native materials excavated originally and stored on Wessen Lane.

c. Drill holes in the sides of each pair of the columns facing one another within the bent. The holes would be spread out from the footings to the tops of the columns at a certain spacing. Epoxy steel rebar dowels in the holes and tie horizontal bars to the dowels spanning the space between the pair of columns at each bent. Tie vertical bars to the horizontal ones, create a "cage," place forms on each side of the cage and pour a concrete infill wall between each pair of columns from the top of the footings to the bottom of the bent cap beam. No discharge into the creek or contact between the ground water and concrete would be allowed. This transforms the 2-column bents to walls. The walls would be recessed since they are 1.5 feet thick while the existing columns are 2 feet wide. Once the infill wall concrete has cured and the forms are removed, backfill the remaining space in the trench at Bents 2 and 3 with a 2 ½-foot layer of rock riprap at the base, topped with a 2 ½-foot layer of the native soils left over from excavation work, up to the current surface of the creek bed. At Bent 4 the trench would be backfilled with soil from the bottom all the way to the creek bed. This retrofit would address the seismic brittleness of the cap beams and the columns when the structure moves sideways during the MCE.

d. At each bent, drill horizontal holes into the vertical superstructure diaphragms that connect the ends of the girders and sit atop the bent cap beams. Drill horizontal holes through the vertical faces of the bent cap beam as well. Place steel restrainer cables through both sets of drilled holes, wrap them around the cap beam and

anchor the ends of the cables against the cap beam. This would tie the super- and substructure together and prevent the unseating of the former during the MCE.

e. New concrete stoppers would be attached to the face of each bent cap with epoxied into drilled holes, reinforced with steel rebars. This would not only stop the superstructure from sliding sideways (transversely) on the bent caps, but also act as a belt-and-suspender system in conjunction with the cable restrainers to limit the longitudinal movements of the girders and prevent their unseating.

4. Repair the concrete spalls on the underside of the bridge deck slab, the girders, the columns and the bent cap beams. In many of such spots the concrete has either spalled off or cracked and flaked, leaving the reinforcement exposed and rusted. The repairs entail removing the unsound concrete at these locations, cleaning the rust on the reinforcement and covering the exposed area with special grout. This work would be primarily done on scaffolding and from lifts placed on the creek bed. Grout or concrete used for this operation would be contained and prevented from contact with the creek bed or water flow.

5. At each of the two abutment locations, excavate the approach roadways three feet deep and for a distance of 20 feet away from the ends of the bridge, with a width matching the bridge width. Place formwork in each excavated area to create a 4-cell "waffle" configuration with an overall shape of a parallelogram once the concrete is poured. Backfill the spaces within the waffle structure with soil, tamp the soil to 95% relative compaction and anchor the ends of the bridge to the slab with cables or other hardware before topping the waffle with a 9-inch-thick slab to serve as the riding surface.

   An existing 6-inch waterline at the east abutment, and possibly a 4-inch polyvinyl chloride pipe waterline at the west abutment, may interfere with these waffle slabs. In this case, these utilities would be relocated by Marin Municipal Water District (MMWD). Also, a 12-inch-diameter corrugated metal pipe (CMP) storm drain pipe, crossing Creek Road and daylighting at the south creek bank slightly downstream of the bridge, interferes with the south abutment's waffle slab and would be redirected around the slab. This would take place by abandoning the current pipe, excavating a sloped trench in the street and the adjacent creek bank and placing a new length of 12-inch CMP below the surface to daylight at the current location. The trench would be covered back up and the street pavement restored. Where the existing pipe currently daylights, the creek bank has been eroded. A 6-foot wide by approximately 20-foot long by 2-foot deep course of riprap would be placed flush with the surface of the creek bank just below where the flows exits the pipe in order to stop and prevent further bank erosion.

6. Remove the asphalt on the bridge deck's travel surface using a special grinding machine, clean the deck, patch the unsound concrete spots and seal the deck with

methacrylate to fill all the cracks. Replace the expansion joint seals at the three existing bridge deck joints at the bents.

7. Upon the completion of the work in the creek, plant restoration and mitigation work would be implemented. Vegetation disturbed by or removed for construction would be replaced. The approach roadways pavement excavated for waffle slab construction would be tidied up and restriped and the road would be opened for travel.

1.4.2. Authorities and Discretion

The Action is proposed by the Town of Fairfax and Caltrans under the FHWA Local Assistance Program. Caltrans, as assigned by the FHWA, assumes all of the FHWA environmental responsibilities under National Environmental Policy Act (NEPA) and other environmental laws (NEPA Delegation). This delegation authority is limited to highway projects, including Local Assistance Federal Aid projects, and specific projects within the State or a programmatic delegation. Therefore, Caltrans must ensure joint projects with FHWA or projects funded with Federal Aid are in compliance with NEPA. The proposed Action is regulated by the Clean Water Act (CWA) Sections 404 and 401 Section 404 and California Fish and Game Code Sections 1600-1616.

1.4.3. Project Location

The Creek Road Bridge (Caltrans Bridge No. 27C-0144) is located over San Anselmo Creek in the Town of Fairfax, Marin County, California. Site elevations range from approximately 100 to 150 feet NAVD88. Creek Road is a local road in a developed area. The adjacent land use is residential (single family homes). The bridge is located on the San Rafael United States Geologic Survey (USGS) 7.5-minute quadrangle map at latitude W37.585932, longitude N122.352612. A map of the Project Location is included as Figure 2, and photographs of the Action Area are included as Appendix B.

1.4.4. Define Action Area

The Action Area includes all habitats directly and indirectly affected by the proposed Action. This includes all areas to be disturbed by the proposed Project, access roads, staging areas, and extends 100 feet beyond the proposed Project in all directions (Figure 3). No effects are anticipated beyond 100 feet based upon implementation of measures as described below and surrounding urban development. The adjacent land use is residential (single family homes). The Action Area extends up and downstream 100 feet from the bridge along the stream corridor to account for temporary effects, such as turbidity, during the de-watering phase of work.

1.4.5. Conservation Measures

The proposed Action incorporates several measures to avoid or minimize effects to listed fish and their critical habitat. These measures are outlined in the subsequent sections of 1.4.5.

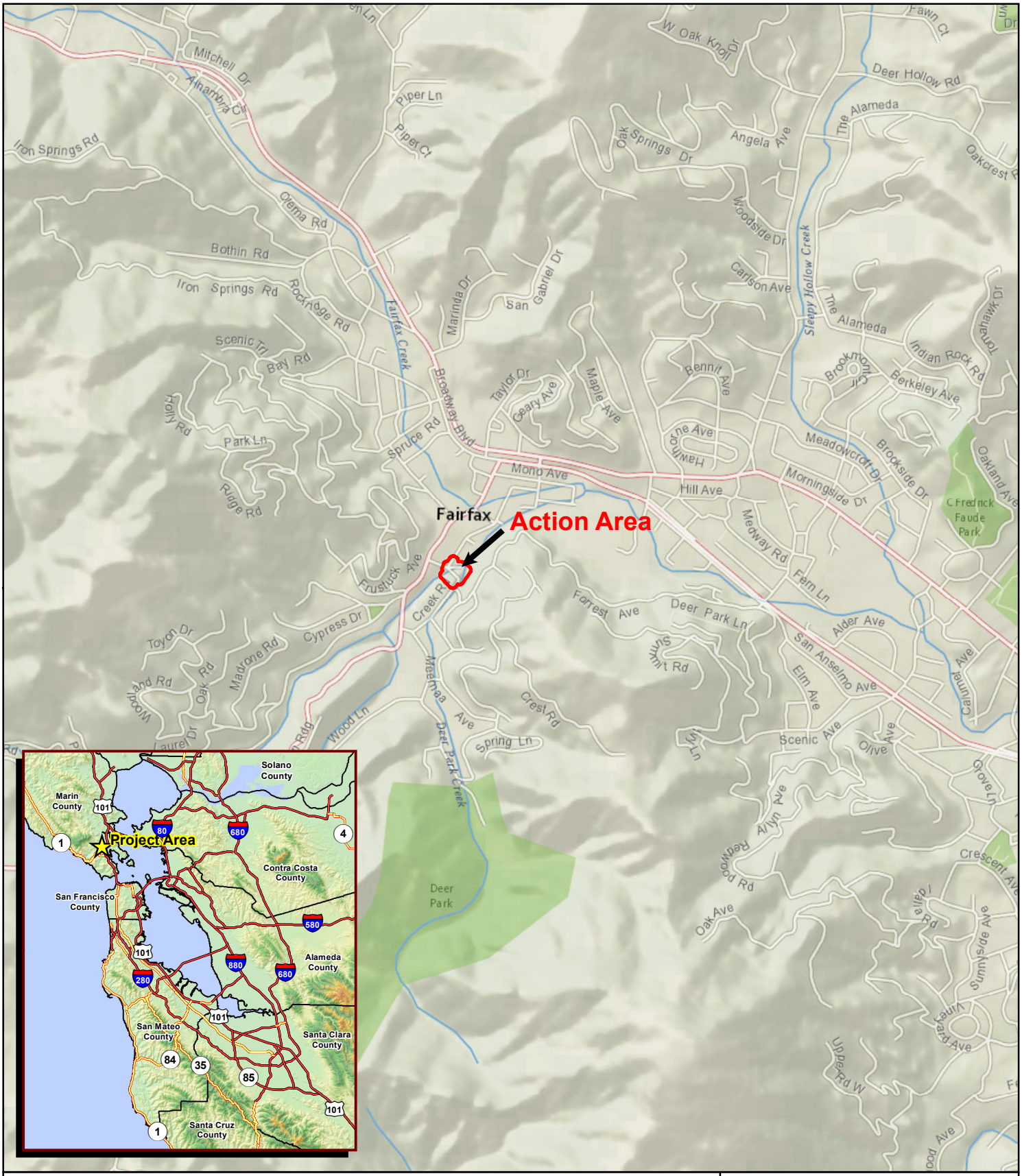


Figure 2. Action Area Location Map

Creek Road Bridge
Section 7 Biological Assessment
Marin County, California

0 0.125 0.25 0.5
Miles

ENVIRONMENTAL CONSULTANTS

Date: October 2014
Map By: Jonathan Hidalgo
Basemap: National Geographic, ESRI Stream

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Creek Road\Figure 1. Location.mxd



Figure 3. Biological Communities within the Action Area

N
W E
S

ENVIRONMENTAL CONSULTANTS

Creek Road Bridge
Section 7 Biological Assessment
Marin County, California

0 25 50 100 Feet

Map Prepared Date: 5/9/2017
Map Prepared By: pkobylarz
Base Source: Esri Streaming - NAIP 2014
Data Source(s): WRA

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Creek Road\CreekRoad_Apr2017\Bioological Communities.mxd

1.4.5.1. PROJECT DESIGN MODIFICATIONS FOR AVOIDANCE AND MINIMIZATION

- The primary construction shall be completed during the dry season, between April 15 and October 15.
- Final grading in the creek bed shall conform to the existing creek channel both downstream and upstream, and existing bed materials would be replaced with similar sized materials. This will ensure no changes to fish passage as a result of the Action.
- Regulatory approval shall be obtained for all work within potentially jurisdictional areas, including approval from the Corps, RWQCB, CDFW, and NMFS. All work within these areas shall conform to any conditions imposed by the regulating agencies.
- Prior to any clearing, grubbing, pruning, or groundbreaking activity, the limits of construction shall be fenced with temporary high-visibility construction fencing to protect environmentally sensitive areas, including all riparian or wetland vegetation and prevent any equipment from unnecessarily extending the work area or entering the wetted channel. In addition, silt fencing shall be installed at the base of the construction fencing to prevent debris from entering the creek. All fencing shall be removed upon proposed project completion.
- Prior to construction, the contractor shall be required to prepare an Accidental Spill Prevention and Cleanup Plan. This plan shall include required spill control absorbent material, for use beneath stationary equipment, to be present on-site and available at all times.
- To minimize fluid leaks during operation, refueling, and maintenance of stationary equipment spill control absorbent material shall be in place underneath this equipment at all times to capture potential leaks. All refueling and maintenance of equipment, other than stationary equipment, shall occur outside the creek's top-of-bank. Any hazardous chemical spills shall be cleaned immediately.
- All stockpiling of construction materials, equipment, and supplies, including storage of chemicals, refueling and maintenance, shall occur outside the creek channel. No equipment would be washed where runoff could enter the creek.
- No motorized equipment shall be left within the channel (top of bank to top of bank) overnight, unless a container or similar method is securely placed beneath the equipment to catch any fluid leakage. All contained fluids shall be disposed of in a permitted manner.
- The contractor shall be required to use a drilling mud and slurry seal that is nontoxic to aquatic life if there are drilling activities related to construction of the proposed project. All drilling muds and fluid would be contained on-site in tanks and disposed of in a permitted manner. Fluids from saw cutting and other activities would be collected and not allowed to flow into the creek.
- No equipment, including concrete trucks, shall be washed within the channel of the creek, or where wash water could flow into the channel. Prior to proposed project construction, the contractor shall establish a concrete washout area for concrete trucks in a location where wash water would not enter the creek or adjacent areas. The washout area would follow the practices outlined in the San Francisco Bay Regional Water Quality Control Board Erosion and Sediment Control Field Manual (page 107-108, July 1999) or equivalent guidelines. Substitution of the designated concrete washout area or methods will require prior approval of the Town of Fairfax.

- All water that comes in contact with wet concrete shall be pumped directly into tanks and disposed of at a permitted location.
- If work is to occur on the roadway and bridge, i.e. above top of bank, approaches during the period October 15 to June 15, all drainage inlets within the proposed project site shall be protected from receiving polluted storm water through the use of filters such as fabrics, gravel bags, straw wattles, or other appropriate BMPs.
- Water encountered during construction of the bridge foundations shall be managed in accordance with an approved dewatering plan.
- All workers shall ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the work area are deposited in covered or closed trash containers. The trash containers would not be left open and unattended overnight.
- All disturbed areas around the bridge bents and abutments shall be re-graded to match the surrounding topography by October 15. Seed and certified weed-free straw will be placed on disturbed areas in the proposed project site (with the exception of the lower creek banks, creek bed, and areas below the OHWM). A jute mesh type or equivalent matting will be placed over the straw, installed per the manufacturer's instructions. This matting will have no plastic incorporated into it. Substitution of materials or erosion control methods will require prior approval of the Town of Fairfax.

1.4.5.2. SPECIES SPECIFIC AVOIDANCE/MINIMIZATION MEASURES OR BMPS

The Action Area contains designated critical habitat for steelhead, Central California Coast (CCC) Distinct Population Segment (DPS) and Coho salmon, and Pacific Salmonid Essential Fish Habitat (EFH) is present. Although downstream barriers to fish passage reduce the potential for steelhead to occur within the Action Area, steelhead are considered present in the Action Area. The following measures will be implemented to minimize effects to steelhead, designated critical habitat, and EFH.

- Consultation with NMFS shall be conducted to ensure proposed project design would not result in a permanent adverse effect to steelhead, critical habitat, or EFH.
- In-water work and work within the channel shall be conducted during the dry season (June 1 through October 31) to avoid disrupting the adult migration cycle and when steelhead are least likely to be present within the Action Area. In-water work outside of this period shall require approval by NMFS.
- Work shall be conducted in isolation from flowing water. Prior to the start of construction activities, the work area will be isolated using temporary cofferdams, and flowing water shall be temporarily diverted around the isolated area.
- A fish rescue and relocation plan shall be developed prior to the onset of any in-water work. The plan shall be implemented by a qualified biologist during dewatering activities in San Anselmo Creek. The fish rescue and relocation plan shall include an overview of the proposed methods for dewatering, expected location and duration of dewatering activities, and methods for conducting fish rescue and relocation during dewatering activities.
- If de-watering is necessary, pumps with 0.2-inch mesh will be used to remove standing water from the work area within the coffer dams to a filtration basin to prevent direct discharge into the creek. If a filtration basin is not available, filter bags will be placed

surrounding the hose-release and the hose-release end will be placed on a level area outside of the wetted creek channel to allow water to settle prior to returning to the creek. No pumped water will be directly discharged into the creek. Allowing the pumped water to settle in a filtration basin or release through filter bags will prevent increase in turbidity or sediment loads during the de-watering process.

- The creek banks shall be restored to pre-project conditions following the completion of work.
- The creek channel shall be restored to the original grade using native cobble, gravel, and soils in appropriate ratios to mimic pre-project conditions.
- Vegetation removal in the riparian zone shall be minimized and the area shall be replanted with suitable native species following construction.

1.4.5.3. CONSERVATION MEASURES

Work within San Anselmo Creek is necessary to complete the proposed Action. San Anselmo Creek is designated critical habitat and EFH, and steelhead may be present. Implementation of the above described conservation measures will reduce potential effects to steelhead, critical habitat, and EFH.

All in-water work will be limited to the June 1 – October 15, the standard work window to avoid the adult steelhead migration season and when steelhead are least likely to be present within the Action Area. This window is also the period of lowest flow to limit temporary downstream effects during de-watering activities. Erosion control measures including de-watering the work area during proposed project activities will reduce the potential for increased sediment loads downstream of the Action Area. BMPs during de-watering will ensure no temporary increase in turbidity or sediment loads will occur. A fish rescue and relocation will occur prior to de-watering the creek work area to ensure all fish species are relocated safely outside of the work area.

Infill walls between the bents will result in a small amount of permanent fill within the creek bed and steelhead critical habitat. The infill walls are restricted to between existing bents in the direction of flow, and no detectable change in flow conditions are anticipated. Riprap will be placed at two bents; however, all riprap will be below the creek surface and natural cobble will be placed above the infill walls to return the creek surface to pre-project conditions. The riprap will result in a negligible loss to subsurface creek habitat, but will not result in a change to the surface, substrate, grade, or flow conditions. Therefore, no permanent indirect effects are anticipated to occur to designated critical habitat as a result of the proposed Action. No changes to fish passage are anticipated.

Riprap will be placed within the riparian woodland habitat to prevent further erosion of the banks at the stormdrain outfall, and will not enter the creekbed. The stream channel and banks will be restored to near pre-project conditions following the completion of bridge work, which includes recreating the streambed gradient that currently exists. Restoration will use previously

excavated cobble and gravel substrate to mimic the channel conditions prior to excavation, including creek gradient. As such, the project will not change fish passage conditions.

1.4.6. Interrelated and interdependent Actions

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

No interrelated or interdependent effects are expected as a result of the Action because all Action activities are considered under the primary Action described in this document.

Chapter 2. Study Methods

2.1. Summary

A Natural Environment Study was prepared for the proposed Action by the Town's consultants in 2016 by WRA, Inc. (WRA) and Kelly Biological Consulting (KBC) (KBC and WRA 2016). As part of that document, the CDFW's California Natural Diversity Database (CNDDB), USFWS (USFWS 2018) and NMFS official species lists (NMFS 2016), and the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants were reviewed to determine which federally listed plant and wildlife species have been documented from within the vicinity of the Action Area. These databases were reviewed again in February 2017 and January 2018 to review updated information. These database inquiries focused on the 7.5-minute U.S. Geological Survey quadrangles within five miles of the Action Area: Bolinas, Novato, Petaluma Point, Point Bonita, San Francisco North, San Geronimo, San Rafael, and San Quentin quadrangles. The USFWS and NMFS updated official species lists are provided as Appendix A. Documented occurrence information and habitat conditions observed at the Action Area (see Chapter 3) were used to evaluate the potential for federally listed species to occur within the Action Area based on the professional expertise and experience of the investigating biologists. A habitat assessment for fish and wildlife was conducted by WRA biologists; however, no formal surveys were performed. Assessment level surveys for wildlife species were deemed appropriate for this location based on the nature of the activity, small area of construction, and the general disturbed quality of habitat for federal listed species. Presence is assumed for steelhead based on the review of databases and local knowledge. Surveys for listed plants was conducted by KBC.

2.2. Personnel and Survey Dates

The Town's consultants conducted site visits within the Action Area and vicinity on March 16, April 1 and 17, and May 22 of 2015 to examine habitat elements present, assess the potential for special-status species to be present, and conduct special-status plant surveys. WRA biologists Patricia Valcarcel (wildlife biologist) and Nicholas Brinton (fisheries biologist) conducted the wildlife and fisheries habitat assessments on April 01, 2015 with a follow-up visit on May 22, 2015. Micki Kelly of KBC conducted plant surveys on March 16, April 1 and 17, and May 22 of 2015. Micki Kelly visited the site on April 28, 2017 to provide an update on site conditions. Plant surveys were timed in accordance with blooming periods and were suitable for detection, if present. Qualifications of the biologists are provided in Appendix C.

2.3. Resource Agency Coordination and Professional Contacts

A previous one day geotech bore (4-inch diameter) was required as part of the initial design work in 2013-4. Permit applications for the geotech bore were submitted to the regulatory

agencies (Roberta Morganstern, Corps; Xavier Fernandez, RWQCB; Timothy S. Dodson, CDFW, Gary Stern, NMFS). On December 13, 2013, CDFW issued a letter saying that no Streambed Alteration Agreement was needed. On February 4, 2014, NMFS issued a concurrence letter for the work (file number WCR-2013-145). On February 14, 2014, the Corps authorized the work (file number 2014-02-14-093433). The RWQCB's approach was to let the 45-day window for responding expire, resulting in defacto authorization. The small geotech drilling hole was completed and backfilled on March 14, 2014. On May 16, 2014 a completion memo was submitted to the above agencies.

In June 2015, the Corps, RWQCB, and CDFW (the same individuals identified above) were sent an email asking of compensatory mitigation would be required for the permanent impacts to "other waters". The RWQCB and CDFW responded that it would. There have been no additional agency coordination or professional contacts beyond request and receipt of official species lists.

2.4. Limitations and Assumptions That May Influence Results

All field work was conducted in the spring of 2015 and one site visit was conducted in April 2017 to provide an update on conditions. The region was in the fourth year of a drought during the 2015 field work. The creek and adjacent low areas may have higher surface water (or shallow ground water) levels and generally more mesic conditions during normal rainfall years. The site visits were conducted during daylight hours and consisted of an assessment of likely habitats for special-status plants and wildlife; it did not conform to specific USFWS or NMFS protocols for any species. No detailed fish studies were completed to identify and enumerate fish species present. Data and documents from previous studies in the area were relied upon to evaluate potential presence of fish species, and presence within San Anselmo Creek and the Action Area is assumed for steelhead.

Chapter 3. Environmental Baseline

The Environmental Baseline describes the setting in which the project will occur and includes the effects from past and present Federal, State, private actions; proposed Federal projects with completed section 7 consultations; and contemporaneous State or private actions with consultation in progress. The environmental baseline also considers non-permitted actions (i.e., other nonfederal actions occurring within the Action Area).

3.1. Habitat Conditions in the Action Area

San Anselmo Creek is a perennial creek, with flows that vary with the rainfall patterns of a given season. The watershed that supports it is a local area, primarily the western part of the Town of Fairfax and adjacent open space lands. The Action Area is located in a residential area, and is predominantly developed and disturbed. San Anselmo Creek within the Action Area is located above two partial fish passage barriers at Saunders Avenue and at Pastori Avenue. San Anselmo Creek is still considered anadromous because the barriers only prevent passage during portions of the year when flows are not conducive to fish movement. CCC steelhead is considered present within the watershed.

3.2. Summary of Environmental Baseline

The Action Area is in a residential area, with structures (houses, sheds, etc.), fenced backyards, and landscape areas extending to the top of bank. The Action Area is predominantly developed and disturbed. Most of the creek bank (below the top of bank) is densely vegetated with non-native English ivy (*Hedera helix*), California blackberry (*Rubus ursinus*), and non-native Himalayan blackberry). The areas that are not vegetated, are bare dirt or covered with large rock riprap. With the exception of one small gravel bar, the creekbed is generally unvegetated. Non-native and invasive species are present within the Action Area including fennel (*Foeniculum vulgare*), English ivy, French broom (*Genista monspessulana*), and Himalayan blackberry, or documented within San Anselmo Creek such as New Zealand mud snail (*Potamopyrgus antipodarum*).

San Anselmo Creek is a perennial creek, with flows that vary with the rainfall patterns of a given season. San Anselmo Creek flows though the Action Area towards the north/northeast. Just north of the Action Area, Deer Creek joins San Anselmo Creek. Roughly one quarter of a mile to the north, it joins Fairfax Creek and turns east, eventually flowing into Corte Madera Creek, then San Francisco Bay, and the Pacific Ocean. In wet years, the creek at this location is perennial. At the time of the fieldwork, in a drought year, the flows were low. The channel width at the OHWM is shown in on Figure 3, and is the OHWM as mapped during the site conditions update

on April 28, 2017. The creek is not included on the National System of Wild and Scenic Rivers published by the U.S. Department of the Interior.

The Action Area is located above two partial fish passage barriers at Saunders Avenue and at Pastori Avenue. San Anselmo Creek is still considered anadromous because the barriers only prevent passage during portions of the year when flows are inappropriate. CCC steelhead is considered present within the watershed.

3.3. Describe the Action Area

Within the Action Area the creek bends to the east forming an accretion area on the southeast side. Near the downstream (northeast) edge of the Action Area the creek bends to the north. The channel is approximately 20 feet below the top of bank. The southwestern and north/northwestern banks are relatively steep. During the New Year's Eve flood of 2005, the bridge's west abutment experienced a major washout. The abutment was repaired and protected with rock riprap that extends along the northern (northwestern) bank. The southeastern bank is gently sloped, while the northeastern somewhat steep. Adjacent to the top of bank, lands to the west are relatively flat. A ridge lies to the east. Site elevations range from approximately 100-150 feet.

3.3.1. Vegetation Communities within the Action Area

The Action Area consists riparian woodland, wetland, perennial stream (San Anselmo Creek), unvegetated bank, and developed/disturbed habitats (Figure 3). The mature closed canopy riparian woodland is similar to California Bay (*Umbellularia Californica*) Forest Alliance (Sawyer, J. O., T. Keeler-Wolf, and J. Evens. 2009) and comprises 0.53 acre of the Action Area. Overstory species include native tree species such as big-leaf maple (*Acer macrophyllum*), California bay, and California walnut (*Juglans californica*). The understory is comprised predominantly non-native species. Although California blackberry is present. Non-native understory species include Himalayan blackberry, English ivy, panic veldtgrass (*Ehrharta erecta*), and wall barley (*Hordeum murinum ssp. murinum*). Several small diameter white alders (*Alnus rhombifolia*), big-leaf maples, a young buckeye (*Aesculus californica*), and some sparse arroyo willow (*Salix lasiolepis*) (planted during the 2005 bank work) make up the shrub and tree part of the understory.

A 7-foot by 3-foot (<0.01 acre) wetland area occurs on a gravel bar within the creekbed. The dominant vegetation found here includes hoita (*Hoita macrostachya*), fig (*Ficus carica*), alder (*Alnus rhombifolia*), and Armenian blackberry (*Rubus armeniacus*). The soils are silty sand with 1-3 inch cobble.

The 2.16-acre Action Area is predominantly ruderal disturbed/developed habitats (1.41 acres) include Creek Road, Wessen Lane, and residences. Vegetation in these areas is landscaped with some areas of bare ground or non-native species including English ivy and wall barley.

Chapter 4. Federally-Listed/Proposed Species and Designated Critical Habitat within Action Area

4.1. Federally-Listed/Proposed Species

Of the species documented in the vicinity of the proposed Action (Table 1), only one federally-listed species, CCC steelhead, may be affected by the proposed Action. The species reviewed and potential for presence is shown below in Table 2. For all other species, the Action Area is outside of the known or current range of the species, no suitable habitat is present, or there are barriers to dispersal. No marine, coastal, marsh, or serpentine habitats are present within the Action Area. Coho salmon are extinct from San Francisco Bay tributaries (NMFS 2012, Brown and Moyle 1991); thus, the proposed Action will have no effect on Coho salmon. The Action Area also contains critical habitat for steelhead and Coho salmon, and is EFH for Pacific Salmonids. Anadromous fish, their critical habitat, and EFH require consultation with NMFS. No species or critical habitat under the jurisdiction of the USFWS will be affected by the proposed Action. The remainder of this document focuses on steelhead, salmonid critical habitat, and EFH.

4.2. Discussion of Steelhead

The CCC steelhead DPS is federally threatened. This steelhead DPS includes all naturally spawned populations of steelhead and their progeny in California streams from the Russian River to Aptos Creek and the drainages of the San Francisco and San Pablo bays eastward to and including the Napa River, excluding the Sacramento-San Joaquin River Basin.

Steelhead typically migrate to marine waters after spending 2 years (although up to 7) in freshwater. They then reside in marine waters for 2 to 3 years prior to returning to their natal stream to spawn as 4- or 5-year-olds. Steelhead adults typically spawn between December and June. Preferred spawning habitat for steelhead is composed of perennial streams with cool to cold water temperatures, high dissolved oxygen levels, and fast-flowing water. Abundant riffle areas (willow areas with gravel or cobble substrate) for spawning and deeper pools with sufficient riparian cover for rearing are necessary for successful breeding. Steelhead diet consists of primarily zooplankton while young, aquatic and terrestrial insects, mollusks, crustaceans, fish eggs, minnows and other small fishes, while adults. They do best where dissolved oxygen concentration is at least 7 parts per million. In streams, deep low-velocity pools are important wintering habitats. Spawning habitat consists of gravel substrates free of excessive silt. Winter run steelhead return to streams as early as November and begin breeding shortly thereafter.

Steelhead adults typically return to their natal streams to spawn between December and June. Unlike other Pacific salmonids, steelhead are iteoparous, meaning adults do not always die after spawning (NMFS 2007). Spawning redds or nests generally occur in gravel substrate ranging from 0.5 to six inches and are dominated by two to three inch gravels (CDFG 1998). Juvenile steelhead prefer to rear in eddies and along velocity breaks where they can exert minimal energy holding in one position while being in close proximity to forage on terrestrial and aquatic invertebrates washed downstream. Instream cover such as large woody debris and undercut banks in deep pools, along with sufficient riparian cover form important rearing habitat (USFWS 1986). Growth rate varies based on temperature, with optimal growth thought to occur between 15 and 19 degrees Celsius (Hayes et al 2008).

4.3. Survey Results

Steelhead have been documented within San Anselmo Creek downstream of the Action Area (Leidy et al. 2005). Within the Action Area, San Anselmo Creek is primarily slow riffle habitat with substrate composed of gravels and cobble. During the April 1, 2015 site visit, depths of the creek averaged approximately 3-5 inches and widths varied from 2-10 feet. Channel slope in the Action Area is gradual and no deep pools are present. However, deep pools are present at the upstream and downstream end of the Action Area, greater than 50 feet from the limits of the proposed Action. Pool habitat above and below the Action Area was approximately 12-30 inches deep at the time of the site visit. No impediments to fish passage such as plunge pools, culverts, structures or large substrate are present within the Action Area.

Fish passage downstream of the Action Area has been improved in recent years with the retrofit of the Center Avenue box culvert in 2012 (CEMAR 2012). However, two barriers remain downstream in the form of sub-standard Denil fish ladders. In 2006, Ross Taylor and Associates performed a functional analysis of the ladders at Saunders Avenue and Pastori Avenue. The ladder at Saunders Avenue was classified as a total barrier, while Pastori was classified as a partial barrier. The ladder at Saunders Avenue does not meet required Denil fish ladder criteria but also has a 42-foot-long concrete flume below the ladder which impedes the approach to the ladder (Ross Taylor and Associates 2006). The combination of these features makes the barrier almost entirely impassable, though the report notes that adult steelhead have been occasionally observed above the barrier. The ladder at Pastori was determined to have a flow capacity and ladder slope which make the ladder unusable by fish during many flow conditions (Ross Taylor and Associates 2006). The combination of these two barriers limits fish passage downstream of the Action Area. Assessments for the removal or modification of both of these barriers have been completed and await funding and permitting through the group, Friends of Corte Madera Creek (FOCMCW 2015). San Anselmo Creek is still considered anadromous because the barriers only prevent passage during portions of the year when flows are inappropriate for fish passage.

Table 2. Federally Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Birds					
marbled murrelet	*Brachyramphus marmoratus*	T	Feeds near shore; nests inland along the Pacific coast, from Eureka to Oregon border, and Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland. Nests often built in Douglas-fir or redwood stands with platform-like branches.	A	The Action Area and immediately surrounding areas are low-density residential developments with riparian woodlands which do not provide nesting habitat for the species. Riparian forest surrounding the Action Area is not old growth redwood required for the platform like structures for nesting by the species.
western snowy plover	*Charadrius alexandrinus nivosus*	T	(Nesting) Federal listing applies only to the Pacific coastal population. Found on sandy beaches, salt pond levees and shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	A	Sandy beaches, salt flats or alkali lake flats that this species inhabits are absent from the Action Area and immediate surrounding areas.
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	T	Breeds in dense riparian forests and jungles. Utilizes densely-foliaged deciduous trees and shrubs. Current distribution within California very restricted.	A	Marin County is not within the documented breeding range of this species. Additionally, the extensive riparian woodland habitat that this species inhabits is absent from the Action Area.
short-tailed albatross	*Phoebastria albatrus*	E	Highly pelagic; comes to land only when breeding. Nests on remote Pacific islands. Rare non-breeding visitor to the eastern Pacific.	A	Short-tailed albatross does not nest in Marin County. Additionally, suitable marine foraging habitat does not occur within 5 miles of the Action Area.
California Ridgway's (clapper) rail	*Rallus obsoletus (longirostris) obsoletus*	E	Resident in tidal marshes of the San Francisco Bay Estuary. Requires tidal sloughs and mud flats for foraging, and dense vegetation for nesting. Associated with abundant growth of cordgrass and pickleweed.	A	The Action Area is not within the known breeding distribution of this species. The Action Area lacks any salt marsh habitat which this species requires for nesting and foraging.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California least tern	*Sternula antillarum browni*	E	Colonial breeder on barren or sparsely vegetated, flat substrates near water. Breeding colonies in San Francisco Bay on estuarine shores and abandoned salt ponds.	A	The Action Area is not within the known breeding distribution of this species. Islands, shores, levees or salt ponds that support nesting by this species are absent. The Action Area does not occur near marine environments to support foraging.
northern spotted owl	*Strix occidentalis caurina*	T	Old-growth forests or mixed stands of old-growth and mature trees. Occasionally in younger forests with patches of big trees. Prefers high, multistory canopy dominated by big trees, trees with cavities or broken tops, woody debris and space under canopy.	A	The Action Area and immediately surrounding areas are low-density residential developments with riparian woodland habitats. Riparian woodland does not typically support the species or its preferred prey. The nearest documented nest location is greater than 0.5 mile from the Action Area.
Mammals					
Guadalupe fur seal	*Arctocephalus townsendi*	T	Breed on Isla de Guadalupe off the coast of Mexico, occasionally found on San Miguel, San Nicolas, and San Clemente islands. Prefers shallow, nearshore island water with cool, sheltered rocky areas for haul-out.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.
sei whale	*Balaenoptera borealis*	E	Inhabits oceans and adjoining seas, and prefers deep offshore waters. Avoids polar and tropical waters and semi-enclosed bodies of water. Migrates annually from sub-polar waters in summer to temperate waters in winter.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.
blue whale	*Balaenoptera musculus*	E	Lives in open oceans occasionally swimming in small groups but usually alone or in pairs. Often spend summers feeding in polar waters and migrate to equatorial regions during winter.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
finback (=fin) whale	*Balaenoptera physalus*	E	Found in deep, offshore waters of open oceans, primarily in temperate to polar latitudes.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.
southern sea otter	*Enhydra lutris nereis*	T	Nearshore marine environments from about Año Nuevo, San Mateo County to Point Sal, Santa Barbara County.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.
right whale	*Eubalaena (Balaena) glaciali*	E	Primarily occurs in coastal or shelf waters. Their distribution is strongly correlated to the distribution of their prey.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.
sperm whale	*Physeter catodon (macrocephalus)*	E	Tend to inhabit areas with a water depth of 600 m or more, and are uncommon in waters less than 984 feet (300 m) deep.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species.
salt-marsh harvest mouse	*Reithrodontomys raviventris*	E	Found only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat. Do not burrow, build loosely organized nests. Require higher areas for refuge.	A	The Action Area and immediately surrounding areas are low-density residential developments with riparian woodland habitats. Salt marshes that are required to support nesting by the species do not occur in the Action Area.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Amphibians and Reptiles					
loggerhead turtle	*Caretta caretta*	T	Loggerheads occupy three different ecosystems during their lives: beaches, open water and nearshore coastal areas. Occurs throughout the temperate and tropical regions of the Pacific.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any beach or marine habitat which is required by this species.
green sea turtle (west coast populations)	*Chelonia mydas*	T	Found in fairly shallow waters inside reefs, bays and inlets with marine grass and algae. Open beaches with sloping platform and minimal disturbance for nests.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any beach or marine habitat which is required by this species.
leatherback turtle	*Dermochelys coriacea*	E	Pelagic, living in the open ocean and occasionally entering the willower water of bays and estuaries. Nesting beaches are sandy with a gradual slope and a deep water approach.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any beach or marine habitat which is required by this species.
olive (Pacific) ridley sea turtle	*Lepidochelys olivacea*	T	Primarily a pelagic sea turtle. Known to inhabit coastal areas, including bays and estuaries. In the Pacific, occur from Southern California to Northern Chile.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any beach or marine habitat which is required by this species.
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T	Inhabits chaparral and foothill-hardwood habitats in the eastern Bay Area. Prefers south-facing slopes with rock outcroppings where shrubs form a vegetative mosaic with oak trees and grasses.	A	The Action Area is not within the known distribution of this species. No scrub, grassland, or chaparral habitat is present within or near the Action Area.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California red-legged frog	*Rana draytonii*	T	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11 to 20 weeks of inundation for larval development. Must have access to estivation habitat.	A	Areas within the Action Area and immediately surrounding are low-density residential developments. No ponds or lakes exist nearby that could provide adequate still water habitat to support breeding by the species.
Fishes					
green sturgeon	*Acipenser medirostris*	T	Spawn in the Sacramento River and the Klamath River. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any marine habitat which is required by this species for foraging.
tidewater goby	*Eucyclogobius newberryi*	E	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in willow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any lagoon habitat which is required by this species.
Delta smelt	*Hypomesus transpacificus*	T	Lives in the Sacramento-San Joaquin estuary in areas where salt and freshwater systems meet. Occurs seasonally in Suisun and San Pablo Bays and Carquinez Strait.	A	The Action Area is not within the known breeding distribution of this species. Additionally, The Action Area lacks any brackish water habitat which is required by this species.
Coho salmon - central California coast Salmon	*Oncorhynchus kisutch*	E	Federal listing is limited to naturally spawning populations in streams between Humboldt County and Santa Cruz County. Spawn in coastal streams 4-14C. Prefer beds of loose, silt-free, coarse gravel and cover nearby.	HP, CH	The creek is designated as critical habitat for the species. However, the species is considered extirpated from the waters of San Francisco Bay (NMFS 2012).

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
steelhead - central California coast	*Oncorhynchus mykiss*	T	Occurs from the Russian River south to Soquel Creek and Pajaro River. Also in San Francisco and San Pablo Bay Basins. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for 1 or more years before migrating to the ocean.	P, CH	The creek is designated as critical habitat for the central California coastal DPS of this species. Though two barriers to anadromy exist downstream of the Action Area, the species is considered present within the Action Area.
steelhead - central valley	*Oncorhynchus mykiss irideus*	T	The Central Valley DPS includes all naturally spawned populations (and progeny) in the Sacramento and San Joaquin Rivers and tributaries, excluding San Francisco and San Pablo bays and their tributaries.	A	The creek is designated as critical habitat for the central California coastal DPS steelhead. This DPS of steelhead only spawns within the Sacramento and San Joaquin Rivers but not within other tributaries of San Francisco Bay. Therefore, the Action Area occurs outside of the known range of the species.
Chinook salmon – Sacramento River winter-run	*Oncorhynchus tshawytscha*	E	Occurs in the Sacramento River below Keswick Dam. Spawns in Sacramento River but not in tributary streams. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams.	A	The Action Area is not within the known breeding distribution of this species. This species is only known to spawn in the Sacramento River. Additionally, the Action Area lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
Chinook salmon - Central Valley spring-run	*Oncorhynchus tshawytscha*	T	Occurs in the Sacramento River below Keswick Dam. Spawns in the Sacramento River but not in tributary streams. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams.	A	The Action Area is not within the known breeding distribution of this species. This species is only known to spawn in the Sacramento River. Additionally, the Action Area lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Chinook salmon - California coast	*Oncorhynchus tshawytscha*	T	California Coastal Chinook Salmon ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive). Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel.	A	The Action Area is not within the known breeding distribution of this species. Additionally, the Action Area lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
longfin smelt	*Spirinchus thaleichthys*	C	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15 to 30 ppt, but can be found in completely freshwater to almost pure seawater.	A	The Action Area is not within the known breeding distribution of this species. Additionally, the Action Area lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
eulachon	*Thaleichthys pacificus*	T	Occur in nearshore ocean waters and to 1,000 feet (300 m) in depth, except for brief spawning runs into their natal (birth) streams. Ranges from northern California to southwest Alaska and southeastern Bering Sea.	A	The Action Area is not within the known breeding distribution of this species. Additionally, the Action Area lacks any marine or brackish water habitats which may be used for foraging or rearing habitat by the species.
Invertebrates					
conservancy fairy shrimp	*Branchinecta conservatio*	E	Endemic to grasslands of the northern two-thirds of the Central Valley; found in large, turbid pools. Inhabit astatic pools in swales formed by old, braided alluvium; filled by winter/spring rains, last until June.	A	The Action Area is not within the known range of this species. The Action Area does not contain any grassland or vernal pool features that can support the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
San Bruno elfin butterfly	*Callophrys mossii bayensis*	E	Inhabits coastal mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium.*	A	The Action Area is not within the known breeding distribution of this species. Areas within the Action Area and immediately surrounding are low-density residential developments and are largely comprised of riparian woodland habitats. The Action Area contains no grassland that may support the host plants required by the species.
black abalone	*Haliotes cracherodii*	E	Generally occur in areas of moderate to high surf in mid to low rocky intertidal areas.	A	The Action Area is not within the known breeding distribution of this species. The Action Area does not contain any intertidal shores or marine environments which are required to support the species.
white abalone	*Haliotis sorenseni*	E	Rocky pinnacles and deep reefs in southern California; especially those off the Channel Islands. Live at depths from 80 to 200 feet.	A	The Action Area is not within the known breeding distribution of this species. The Action Area does not contain any intertidal shores or marine environments which are required to support the species.
mission blue butterfly	*Icaricia icarioides missionensis*	E	Inhabits grasslands of the San Francisco peninsula. Three larval host plants: *Lupinus albifrons, L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	A	The Action Area is not within the known breeding distribution of this species. The Action Area does not contain grassland required to support the host plants of the species.
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	E	Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; extirpated from coastal San Mateo County. Larval food plant thought to be *Viola adunca*.	A	The Action Area is not within the known breeding distribution of this species. The Action Area does not contain grassland to support the host plants or foraging by the species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
California freshwater shrimp	*Syncaris pacifica*	E	Endemic to Marin, Napa, and Sonoma counties. Found in low elevation, low gradient streams where riparian cover is moderate to heavy. Shallow pools away from main stream flow. Winter: undercut banks with exposed roots. Summer: leafy branches touching water.	A	The Action Area is not within the known breeding distribution of this species. Suitable habitat for the species is primarily found within northern Marin County along the border with Sonoma County. This species has not been documented in San Anselmo Creek.
Plants					
robust spineflower	*Chorizanthe robusta* var. *robusta*	E	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub, sandy or gravelly.3-300 m. Flowers April-September.	A	All known occurrences of this species in the vicinity of the Action Area are associated with sandy/gravelly soils in coastal habitat. The Action Area lacks suitable sandy/gravelly soils in coastal habitat.
Sonoma spineflower	*Chorizanthe valida*	E	Sandy coastal prairie. 10-305 m. Flowers June-August.	A	All known occurrences of this species in the vicinity of the Action Area are associated with sandy soils in coastal prairie habitat. The Action Area lacks suitable sandy coastal prairie habitat.
golden larkspur	*Delphinium luteum*	E	Chaparral, coastal prairie, coastal scrub/rocky. 1-100 m. Flowers March-May.	A	The Action Area is not in the critical habitat area and lacks suitable chaparral, coastal prairie habitat.
Marin western flax	*Hesperolinon congestum*	T	Serpentinite soil, chaparral, valley and foothill grassland. Known only from Marin, San Francisco, and San Mateo counties. In serpentine barrens and in serpentine grassland chaparral. 5-370 m. Flowers April-July.	A	No serpentine or suitable habitat is present in the Action Area.
Santa Cruz tarplant	*Holocarpha macradenia*	T	Coastal prairie, coastal scrub, Valley and foothill grassland, often clay. 10-20 m. Flowers June-October.	A	The Action Area lacks suitable habitat for this species. No scrub, prairie, or grassland is present.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
white-rayed pentachaeta	*Pentachaeta bellidiflora*	E	Valley and foothill grassland, coastal scrub, coastal prairie, open dry rocky areas, often serpentine. 35-620 m. Flowers March-May.	A	The Action Area lacks suitable dry rocky habit. This species was not observed during the field surveys, which were conducted during the flowering period.
showy rancheria clover	*Trifolium amoenum*	E	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite), open sunny sites.5-415 m. Flowers April-June.	A	All known occurrences of this species in the vicinity of the Action Area are found in open sunny sites in chaparral and grassland. The Action Area has limited suitable habitat. This species was not observed during the field surveys, which were conducted during the flowering period.

* Key to status codes:
E Federal Endangered
T Federal Threatened
C Federal Candidate

*Presence:
Absent [A] - no habitat present and no further work needed.
Habitat Present [HP] -habitat is, or may be present. The species may be present.
Present [P] - the species is present.
Critical Habitat [CH] - project footprint is located within a designated critical habitat unit, but does not necessarily mean that appropriate habitat is *present.*

Gravel and cobble substrate are present but San Anselmo Creek within the Action Area does not provide suitable temperature or flow conditions for spawning. No spawning habitat is present; however, steelhead may migrate through the Action Area. No pool habitat is present within areas of proposed activities, but pools are present at the upstream and downstream ends of the Action Area. These pools may provide habitat for rearing, feeding, and refuge. Therefore, steelhead are considered present within San Anselmo Creek and juveniles or adults may be present throughout the year. The immediate area of the proposed Action does not provide habitat for more than fish passage; however, pools are present both upstream and downstream.

4.4. Status of Designated Critical Habitat in the Action Area for Coho Salmon and CCC Steelhead

The segment of San Anselmo Creek which runs through the Action Area is designated critical habitat for both Coho salmon (64 FR 24049) and CCC steelhead (70 FR 52488). The definition of critical habitat includes “space for individual and population growth, and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing offspring; and, generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of this species.” For salmon and steelhead species, the physical and biological features which are essential to these functions and defined in the critical habitat designation include, but are not limited to, spawning sites, food resources, water quality and quantity, riparian vegetation, migration corridors, estuarine areas, nearshore marine areas, and offshore marine areas. Critical habitat within the Action Area totals 0.75 acre and includes riparian woodland, perennial stream, and unvegetated bank habitats. These features within the Action Area act as a migration corridor for the species, contain riparian vegetation to improve water quality including temperature, and may provide feeding or rearing habitat in the pools at the upstream and downstream ends of the Action Area. No spawning habitat is present.

Chapter 5. Effects of the Project on the Action Area

5.1. Deconstruct Action

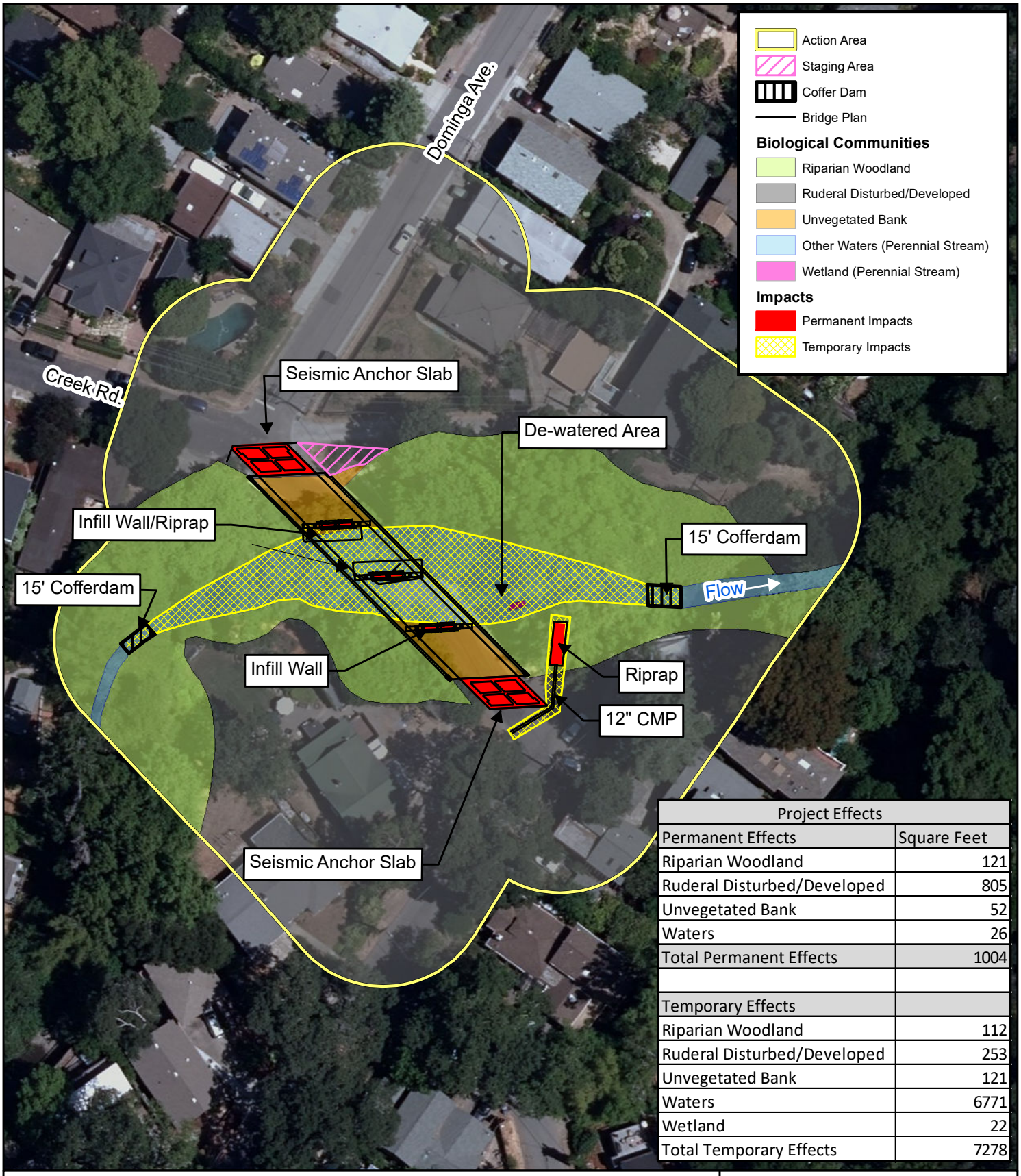
The proposed Action will require work within the creekbed to repair several bents and excavation of the bank to replace an existing storm drain pipe. The Action is designed to return the creekbed to pre-project conditions and has minimized removal of vegetation to the maximum extent. Work within the creekbed will occur within standard work windows and BMPs will be implemented to minimize effects. A fish rescue plan will be implemented to safely relocate fish species, potentially including steelhead, safely outside of the work area, and a de-watering plan will maintain a dry work area free of steelhead. Replacement of the existing storm drain pipe will result in limited excavation of the creekbank above OHWM. The project design and implementation of BMPs will minimize potential temporary and permanent effects to steelhead and salmonid critical habitat.

5.1.1. Construction Scenario (summary)

The Action will occur during the dry season (April 15 – October 15), and all staging will be restricted to top of bank areas within developed and disturbed habitats. All phases that require work within the creekbed will be scheduled June 1 – October 15, which is outside of the steelhead migration window. Equipment necessary for in-water work will be lowered by a crane from the bridge deck into the creekbed to limit disturbance to the creek bank. Crew will access the creekbed from an existing established footpath. It is assumed water will be present during the project and cofferdams will be placed to de-water the work area prior to activities within the creekbed. A fish rescue and relocation will run concurrently with de-watering activities. The creek bed will be excavated at locations surrounding the bents as described above in Section 1.4, and a small amount (<0.001 acre) of fill will be placed subsurface. All originally excavated material will be replaced and the creek surface returned to pre-project contours. Table 3 below and Figure 4 provide the total permanent and temporary effects to habitat.

Table 3. Direct Effects of the Proposed Action on Salmonid Critical Habitat and EFH

Vegetation Community	**Permanent Effects**	**Temporary Effects**
Riparian Woodland	0.003 acre (121 ft^2)	0.003 acre (112 ft^2)
Perennial Stream	<0.001 acre (26 ft^2)/ 25 linear ft	0.155 acre (6,771 ft^2)/ 275 linear ft
Wetland	0.00 acre (0.0 ft^2)	<0.001 acre (22 ft^2)
Unvegetated Bank	0.001 acre (52 ft^2)	0.003 acre (121 ft^2)
Total	0.005 acre (199 ft^2)	0.161 acre (7026 ft^2)



Project Effects	
Permanent Effects	Square Feet
Riparian Woodland	121
Ruderal Disturbed/Developed	805
Unvegetated Bank	52
Waters	26
Total Permanent Effects	1004
Temporary Effects	
Riparian Woodland	112
Ruderal Disturbed/Developed	253
Unvegetated Bank	121
Waters	6771
Wetland	22
Total Temporary Effects	7278

Figure 4. Effects to Biological Communities in the Action Area

N
W E
S

Creek Road Bridge
Section 7 Biological Assessment
Marin County, California

0 25 50 100
Feet

wra
ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 5/15/2017
Map Prepared By: smortensen
Base Source: Marin County (2014)
Data Source(s): WRA

Path: L:\Acad 2000 Files\22000\22304\GIS\ArcMap\Creek Road\CreekRoad_Apr2017\Fig3b_Impacts_20170509.mxd

Replacement of the existing storm drain pipe on the south bank will require excavation at the creek bank. This work will be conducted between April 15 – October 15, and will include BMPs to minimize potential effects to steelhead, critical habitat, and EFH. To the extent feasible, this work will be scheduled to occur when the work area has been de-watered for construction at the bents. This will further reduce potential temporary habitat effects. The area disturbed for the pipe replacement will be revegetated; all effects are temporary. Indirect effects are limited to a temporary rise in turbidity during de-watering activities. No other indirect effects and no permanent indirect effects are anticipated based upon project design and implementation of BMPs.

5.1.2. Sequencing and Schedule

The proposed Action is anticipated to take one full dry season (April 15 – October 15) plus a few weeks outside of this window to complete. All work conducted outside of the dry season work window will be restricted to the existing road surface in disturbed and developed habitats. All BMPs will be in place prior to the start of ground disturbance.

Work at the bents (Step 3) and underside of the bridge (Step 4) which require de-watering of the work area may take up to four months to complete. This work will be conducted simultaneously along with replacement of the storm drain pipe on the creek bank (portion of Step 5) to ensure all work is completed within the June 1 – October 15 work window. This ensures work within the creekbed will be completed outside of the steelhead adult migration season. Cofferdams and, if necessary, a temporary water diversion, will be installed prior to any work within the creekbed, and a fish rescue and relocation will be conducted during the de-watering process to relocate all fish safely outside of the work area. A filtration basin or filter bags on the hose will be used during the de-watering process to ensure no temporary increases in turbidity occur downstream. Any work within the creek bed or banks outside of the June 1 – October 15 work window will require prior approval from NMFS and be dependent upon weather conditions.

Work on the road surface and outside of the creek bed and banks may occur after October 15. BMPs including those for erosion control will be implemented to prevent any material from entering the creek.

5.1.3. Stressors from Project Actions

Stressors induce an adverse response in an organism by any physical, chemical, or biological alteration of the environment (or resource) that can lead to a response from the individual. Stressors can act directly on an individual, or indirectly through effects to a resources.

The Action may temporarily increase turbidity in the creek during work within the creekbed. This is a distinct and temporary indirect stressor to fish downstream of the work area; however, work is restricted to the time of low flow conditions and implementation of BMPs such as temporary water diversion, de-watering of the work area, and filtration during de-watering will reduce

potential for a temporary increase in turbidity. With the implementation of BMPs as described above, no temporary increase in turbidity downstream is anticipated. Fish rescue and relocation as part of de-watering activities will result in a temporary direct stressor to captured fish from capture, handling, and potential environmental changes between capture site and relocation site. Implementation of a fish rescue and relocation plan with qualified biologists will reduce the exposure to stress as a result of fish relocation efforts.

No permanent stressors are anticipated to occur to steelhead or salmonid critical habitat as a result of the proposed Action. The Project design will not result in changes to riparian cover, creek temperature, or fish passage conditions and no such stressors are anticipated as a result of the proposed Action. Riparian vegetation to be removed during work activities is negligible (less than 0.003 acre permanent loss) and the work area will be replanted following completion of the Action. No change in temperature or flow velocity is anticipated to occur based on revegetation of disturbed areas and returning the creekbed to pre-project grade.

5.1.4. Project Operation and Maintenance

During all phases of work, BMPs including erosion control measures will be implemented. Access and staging will be restricted to top of bank areas, and work within the creek bed and banks will be limited to the minimum amount necessary to complete repairs.

Work within the creekbed will be restricted to the June 1 – October 15 work window. Work within the creekbed will be isolated from water through installation of temporary cofferdams and a temporary water diversion to bypass the work area. Isolation of the work area from water will reduce potential for increased turbidity downstream of the work area. Following installation of the cofferdams and temporary water diversion, the work area will be de-watered and a fish rescue and relocation will be conducted during de-watering activities.

5.2. Exposure to Stressors from the Action

Exposures are defined as the interaction of the species, their resources, and the stressors that result from the project action. The proposed Action will require de-watering of the work area and any fish present will be relocated. Work within the creekbed is scheduled outside of the adult steelhead migration period and at the period of lowest flow to reduce potential for fish to be present in the work area. Relocation will temporarily expose fish to capture, handling, and changes in temperature or stream conditions when released. A suitable relocation site will be chosen before the fish rescue and relocation occurs; however, relocation may increase potential for predation in the short-term. Temporary direct effects to steelhead are anticipated during project activities, if present, in the form of harassment or capture for relocation.

De-watering of the work area may temporarily increase turbidity and decrease water quality for fish downstream. De-watering is a distinct, short-term event and implementation of BMPs as

described above will prevent an increase in turbidity downstream of the work area during de-watering.

Although the Action will result in a minor loss of habitat for this species, it is not anticipated to result in stressors or indirect adverse effects to steelhead or designated critical habitat because fish passage conditions will remain unchanged and the Action Area does not contain spawning habitat. The Action will not result in a change to fish passage, forage, cover, connectivity; no indirect adverse effects are anticipated to steelhead or salmonid critical habitat.

5.3. Response to the Exposure

The proposed Action will occur in a steelhead migratory corridor, but no spawning habitat is present. The proposed Action will conduct in-water work outside of the adult migration season; therefore, only juveniles may be present. Rearing habitat is present in pools located upstream and downstream of the proposed work areas. No stream diversions or in-water work will occur in areas containing pools or rearing habitat. Although a temporary passage barrier will be created by in-water work, this work will occur when no major fish movements within the watershed are anticipated. No pools are present in the work area. Temporary direct effects to steelhead are anticipated during project activities, if present, in the form of harassment or capture for relocation. Fish will be held in transfer containers for only a short amount of time and will be quickly relocated to a pre-determined location which provides suitable refuge and conditions for the individuals. Limiting time of the fish in transfer containers will reduce time and amount of stress hormones released in the water and potential for injury in containers. All direct effects will be temporary and short-lived during relocation activities. The temporary water diversion will reduce potential for changes in stream condition such as turbidity; however, turbidity may temporarily increase during de-watering of the work area. Implementation of BMPs as described above will prevent an increase in turbidity downstream of the work area during de-watering. Therefore, de-watering is not anticipated to result in a detectable adverse effect to fish downstream.

The Action will result in a negligible loss of habitat for this species, it is not anticipated to result in indirect adverse effects to steelhead or designated critical habitat because fish passage conditions will remain unchanged and the Action Area does not contain spawning or rearing habitat. The Action will not result in a change to fish passage, forage, cover, connectivity; no indirect adverse effects are anticipated to steelhead or salmonid critical habitat.

5.4. Effects of the Action

Effect is a description of the manner in which the action may affect any listed species or critical habitat and an analysis of any cumulative effect (50 CFR 402.02). The effect of the action is the consequence (behavioral, physical, or physiological) of a response to a stressor.

5.4.1. Steelhead

Project construction will result in temporary direct effects to steelhead; however, no permanent adverse effects are anticipated. The proposed project is scheduled during the time steelhead are least likely to be present and passing through the Action Area, and a fish rescue and relocation will be conducted to relocate any steelhead present during project de-watering activities. However, if present during proposed project activities, steelhead may be harmed, harassed, or captured during fish rescue and relocation activities. Avoidance and minimization measures such as the fish rescue and relocation plan will reduce the potential for take in the form of injury or mortality to occur. The temporary water diversion will reduce changes in stream conditions such as an increase in turbidity during work within the creekbed. Implementation of BMPs during de-watering will reduce potential for a temporary increase in turbidity and no increase in turbidity downstream of the work area is anticipated. The bridge work will add material to the existing structures but will not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream.

Although the project will result in a minor loss of habitat for this species, it is not anticipated to result in an indirect adverse effect to steelhead because fish passage conditions will remain unchanged and the Action Area does not contain spawning or rearing habitat. Therefore, no indirect adverse effects to reproduction, juvenile survival, or migrating adult steelhead are anticipated to occur.

5.4.2. Salmonid Critical Habitat

Approximately 0.005 acre (199 square feet) of permanent effects and 0.161 acre (7,026 square feet) of temporary effects to designated critical habitat for steelhead and Coho salmon are expected to occur. Critical habitat includes San Anselmo Creek, the unvegetated bank, wetland within the creekbed, and riparian habitat within the Action Area. Temporary direct effects to critical habitat will occur as a result of temporary de-watering and trenching within the creek bed for modifying bent footings. Infill walls between the bents will result in the permanent fill of 0.002 acre (78 square feet) within the creek bed and steelhead critical habitat. Based on the location between existing bents in the direction of flow, no detectable changes in flow are anticipated. Riprap will be placed at two bents; however, the fill will be below the creek surface and natural cobble will be placed above the infill walls. Erosion control measures including de-watering the work area during proposed project activities will reduce the potential for increased sediment loads downstream of the Action Area Implementation of BMPs during de-watering will reduce potential for a temporary increase in turbidity and no decrease in water quality downstream of the work area is anticipated. The infill walls will result in a negligible loss to subsurface creek habitat, but is not anticipated to result in a detectable change to creek flow or conditions. Riprap placement subsurface will not result in a change to the surface, substrate, grade, or flow conditions. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation, including creek gradient.

Riprap will be placed within the riparian woodland habitat to prevent further erosion of the banks at the stormdrain outfall, and will not enter the creekbed. The stream channel and banks will be restored to near pre-project conditions following the completion of bridge work, which includes recreating the streambed gradient that currently exists.

The proposed project will not result in any changes to existing land use; and the Action Area will be restored to conditions similar to those before the project. As such, the project will not change fish passage conditions. The Action Area does not contain spawning or rearing habitat, and the proposed project will have no effect on spawning or rearing of steelhead. Therefore, no indirect effects are expected following completion of the Action.

5.5. Conservation Measures and Compensation Proposal

5.5.1. Conservation Measures

The avoidance and minimization measures, project design, and species specific avoidance and minimization measures are described above in Section 1.4.5. These measures will be implemented and are summarized again in this section.

Work within San Anselmo Creek is necessary to complete the proposed Action. San Anselmo Creek is designated critical habitat, and steelhead may be present. Implementation of the above described conservation measures will reduce potential effects to steelhead and salmonid critical habitat.

All in-water work will be limited to the June 1 – October 15, the standard work window to avoid the adult steelhead migration season and when steelhead are least likely to be present within the Action Area. This window is also the period of lowest flow and will limit temporary downstream effects during de-watering activities. Erosion control measures including de-watering the work area during proposed project activities will reduce the potential for increased sediment loads and turbidity downstream of the Action Area. A fish rescue and relocation will occur prior to de-watering the creek work area to ensure all fish species are relocated safely outside of the work area.

Infill walls between the bents will result in a small amount of permanent fill within the creek bed and steelhead critical habitat; however, this loss is negligible and a detectable change in flow conditions is not anticipated. Riprap placed at two bents will result in permanent fill; however, this fill will be below the creek surface and natural cobble will be placed above the infill walls to return the creek surface to pre-project conditions. The riprap will result in a negligible loss to subsurface creek habitat, but will not result in a change to the surface, substrate, grade, or flow conditions. Therefore, no permanent indirect effects are anticipated to occur to designated critical habitat as a result of the proposed Action. No changes to fish passage are anticipated.

Riprap will be placed within the riparian woodland habitat to prevent further erosion of the banks at the stormdrain outfall, and will not enter the creekbed. The stream channel and banks will be

restored to near pre-project conditions following the completion of bridge work, which includes recreating the streambed gradient that currently exists. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation, including creek gradient. As such, the project will not change fish passage conditions.

5.5.2. Compensation

No compensatory mitigation or compensation is proposed for the Action. A negligible loss of riparian habitat on the creek bank will result from the proposed Action. This will not result in a measurable or detectable effect to the functions of the creek. No adverse modification of critical habitat is anticipated. All effects to steelhead are temporary and no permanent adverse effects to steelhead or critical habitat are anticipated as a result of the Action.

5.6. Effects of Interrelated and Interdependent Actions/ Conclusions and Determination

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

No interrelated or interdependent effects are expected as a result of the action because all action activities are considered under the primary action.

5.7. Cumulative Effects

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the action area described in this biological assessment. Future Federal actions that are unrelated to the proposed action are not considered in this this section because they require separate consultation pursuant to Section 7 of the Act.

No cumulative effects are anticipated from the proposed project. Downstream fish passage improvements have recently been made and the Lansdale crossing and future improvements to the Saunders and Pastori Avenue crossings are planned (FOCMCW 2015). The improvement of these structures will remove and/or improve passage over the partial barriers which currently impede anadromy during certain flow conditions. The proposed project will restore the Action Area to near pre-project conditions and allow continued fish passage. Restoration to near pre-project conditions will ensure that no barriers are created to fish passage during project activities, and any improvements to downstream fish passage will not be hindered by the proposed project.

5.8. Determination

5.8.1. Species and critical habitat determination

1.) No Effect

A no effect determination was made for species in Table 4 below and no consultation is required.

Table 4. Federally Listed Species Determined to have No Effect

Common Name	Scientific Name	Status
marbled murrelet	*Brachyramphus marmoratus*	T
western snowy plover	*Charadrius alexandrinus nivosus*	T
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	T
short-tailed albatross	*Phoebastria albatrus*	E
California Ridgway's (clapper) rail	*Rallus obsoletus (longirostris) obsoletus*	E
California least tern	*Sternula antillarum browni*	E
northern spotted owl	*Strix occidentalis caurina*	T
Guadalupe fur seal	*Arctocephalus townsendi*	T
sei whale	*Balaenoptera borealis*	E
blue whale	*Balaenoptera musculus*	E
finback (=fin) whale	*Balaenoptera physalus*	E
southern sea otter	*Enhydra lutris nereis*	T
right whale	*Eubalaena (Balaena) glaciali*	E
sperm whale	*Physeter catodon (macrocephalus)*	E
salt-marsh harvest mouse	*Reithrodontomys raviventris*	E
loggerhead turtle	*Caretta caretta*	T
green sea turtle (west coast populations)	*Chelonia mydas*	T
leatherback turtle	*Dermochelys coriacea*	E
olive (Pacific) ridley sea turtle	*Lepidochelys olivacea*	T
Alameda whipsnake	*Masticophis lateralis euryxanthus*	T
California red-legged frog	*Rana draytonii*	T
green sturgeon	*Acipenser medirostris*	T
tidewater goby	*Eucyclogobius newberryi*	E
Delta smelt	*Hypomesus transpacificus*	T
Coho salmon - central California coast Salmon	*Oncorhynchus kisutch*	E
steelhead - central valley	*Oncorhynchus mykiss irideus*	T
Chinook salmon - central California coast	*Oncorhynchus kisutch*	E
Chinook salmon – Sacramento River winter-run	*Oncorhynchus tshawytscha*	E
Chinook salmon - Central Valley spring-run	*Oncorhynchus tshawytscha*	T
Chinook salmon - California coast	*Oncorhynchus tshawytscha*	T
longfin smelt	*Spirinchus thaleichthys*	C
eulachon	*Thaleichthys pacificus*	T
conservancy fairy shrimp	*Branchinecta conservatio*	E
Robust spineflower	*Chorizanthe robusta* var. *robusta*	E
Sonoma spineflower	*Chorizanthe valida*	E
golden larkspur	*Delphinium luteum*	E
Marin western flax	*Hesperolinon congestum*	T
Santa Cruz tarplant	*Holocarpha macradenia*	T
white-rayed pentachaeta	*Pentachaeta bellidiflora*	E

showy rancheria clover	*Trifolium amoenum*	E

2.) May Affect-Not Likely to Adversely Affect (NLAA)

A **may affect-not likely to adversely affect or modify** determination was made for designated critical habitat for CCC steelhead and Coho salmon. Informal consultation is required.

3.) May Affect-Likely to Adversely Affect (LAA)

A **may affect-likely to adversely affect** determination was made for CCC steelhead. Formal consultation is required.

5.8.2. Discussion supporting determination

5.8.2.1. STEELHEAD

If steelhead are present during de-watering activities, steelhead may be harmed, harassed, or captured for relocation during fish rescue and relocation activities. The proposed Action will implement work windows to avoid the adult steelhead migration season. Work within the creek bed and banks will occur between June 1 and October 15 when steelhead are least likely to be present. Avoidance and minimization measures such as the fish rescue and relocation plan will reduce the potential for take in the form of injury or mortality to occur. The temporary water diversion will reduce potential for changes in stream conditions such as an increase in turbidity during work within the creekbed. The bridge work will add material to the existing structures but will not create a barrier across the channel, decrease flows, change substrate size, or channelize the stream.

Although the project will result in a minor loss of habitat for this species, it is an insignificant amount and not anticipated to result in an indirect adverse effect to steelhead because fish passage conditions will remain unchanged and the Action Area does not contain spawning habitat. Therefore, no indirect adverse effects to reproductive success, juvenile survival, or migrating adult steelhead are anticipated to occur.

5.8.2.2. CRITICAL HABITAT

Implementation of BMPs, project design, and avoidance and minimization measures described in Section 1.4.5 will reduce potential for adverse modification of critical habitat. The infill walls and riprap will result in a negligible loss to creek habitat, but will not result in a change to the surface, substrate, grade, or flow conditions. Effects as a result of a loss of 0.003 acre of creekbed and unvegetated bank are negligible and discountable. The infill walls are between existing bents in the direction of flow, and no changes in flow conditions are anticipated from this change. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation, including creek gradient. As such, the project will not change fish passage conditions. The Action Area does not contain spawning or rearing habitat.

No permanent adverse effects to physical and biological features necessary to support the salmonid life cycle including spawning, rearing, and migration habitats will occur as a result of the proposed Action. The proposed Action will not adversely affect or modify critical habitat.

Chapter 6. Magnuson Stevens Fishery Conservation and Management Act of 1976 (as amended)

This act takes immediate action to conserve and manage fishery resources found off the coasts of the US, and the anadromous species and Continental Shelf fishery resources of the US, by exercising sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic anadromous species, Continental Shelf fishery resources and fishery resources in the special areas.

6.1. Essential Fish Habitat

6.1.1. Essential Fish Habitat Background

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the MSFCMA to establish new requirements for EFH descriptions in federal fishery management plans. In addition, the MSFCMA established procedures designed to identify, conserve, and enhance EFH for those species regulated under a federal fisheries management plan. Pursuant to the MSFCMA:

- Federal agencies must consult with NOAA FISHERIES (NMFS) on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NOAA FISHERIES must provide conservation recommendations for any federal or state action that would adversely affect EFH;
- Federal agencies must provide a detailed response in writing to the NOAA FISHERIES within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the effect of the activity on EFH. In the case of a response that is inconsistent with the NOAA FISHERIES' EFH conservation recommendations, the federal agency must explain its reasons for not following the recommendations.

EFH has been defined for the purposes of the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (NOAA FISHERIES 1999). NOAA FISHERIES has further added the following interpretations to clarify this definition:

- **"Waters"** include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate;
- **"Substrate"** includes sediment, hard bottom, structures underlying the waters, and associated biological communities;

- **"Necessary"** means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and
- **"Spawning, breeding, feeding, or growth to maturity"** covers the full life cycle of a species.

Adverse effect means any effect that reduces quality and/or quantity of EFH, and may include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), or site-specific or habitat-wide effects, including individual, cumulative, or synergistic consequences of actions.

EFH consultation with the NOAA FISHERIES is required regarding any federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the Proposed Action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH. The Magnuson-Stevens Act requires consultation for all federal agency actions that may adversely affect EFH. EFH consultation with NOAA FISHERIES is required by federal agencies undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. Under Section 305(b)(4) of the MSFCMA, NOAA FISHERIES is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Wherever possible, NOAA FISHERIES utilizes existing interagency coordination processes to fulfill EFH consultations with federal agencies. For the proposed action, this goal is being met by incorporating EFH consultation into the ESA Section 7 consultation, as represented by this BA.

6.2. Managed Fisheries with Potential to Occur in the Action Area

The MSFCMA requires that EFH be identified for all federally managed species including all species managed by the Pacific Fisheries Management Council (PFMC). The PFMC is responsible for managing commercial fisheries resources along the coast of Washington, Oregon, and California. Managed species that have a potential to occur in the Action Area are covered under the Pacific Salmon Fishery Management Plan (FMP).

The Action Area falls within the Pacific Coast Salmon FMP. Chinook and Coho salmon are managed under this FMP; however, Coho salmon is extirpated from the tributaries of San Francisco Bay and are therefore not present within San Anselmo Creek. Chinook salmon, which do occur in San Francisco Bay, do not occur within the San Anselmo Creek watershed.

6.3. Potential Adverse Effects of Proposed Project on EFH

6.3.1 Adverse Effects on Essential Fish Habitat for Pacific Salmonids

Although no species covered under EFH are anticipated to occur, the Action Area still contains habitat identified as Pacific Coast Salmon EFH. No loss of habitat function or value is anticipated from the proposed project.

Approximately 0.005 acre (199 square feet) of permanent effects and 0.161 acre (7,026 square feet) of temporary effects to EFH are expected to occur. Temporary direct effects to EFH will occur as a result of temporary de-watering and trenching within the creek bed for modifying bent footings. Infill walls between the bents will result in the permanent fill of 0.002 acre (78 square feet) within the creek bed and EFH; however, the fill is between existing walls in the direction of flow, and no detectable change in flow conditions are anticipated from the infill walls. Placement of riprap subsurface at two bents will result in temporary effects to the creekbed; however, all riprap will be placed subsurface and the surface restored to pre-project conditions. No change to the creek surface, substrate, or grade is anticipated to occur from the infill walls, and erosion control measures including de-watering the work area during proposed project activities will reduce the potential for increased sediment loads downstream of the Action Area. Implementation of BMPs during de-watering will prevent a temporary increase in turbidity downstream of the work area, and no adverse effects are anticipated. Therefore, no detectable temporary or permanent indirect adverse effects are anticipated to occur to EFH as a result of the proposed project.

Although the project will result in a negligible loss of EFH, it is not anticipated to result in an indirect adverse effect to EFH because creek surface substrate and fish passage conditions will remain unchanged, and the Action Area does not contain habitat utilized by species managed by the Pacific Coast Salmon FMP.

6.4. Essential Fish Habitat Conservation Measures

6.4.1. Describe the conservation measures that have been incorporated into the project that will minimize the potential adverse effects to EFH.

The avoidance and minimization measures, project design, and species specific avoidance and minimization measures are described above in Section 1.4.5. These measures will be implemented and are summarized again in this section. Measures designed to avoid and minimize effects to critical habitat will be sufficient to avoid and minimize effects to EFH.

Work within San Anselmo Creek is necessary to complete the proposed Action. All in-water work will be limited to the June 1 – October 15. This window is established for steelhead avoidance but will also be the period of lowest flow to limit temporary downstream effects during de-watering activities. Erosion control measures including de-watering the work area during proposed project activities will reduce the potential for increased sediment loads downstream of the Action Area.

Infill walls between the bents will result in a small amount of permanent fill within the creek bed and steelhead critical habitat; however, this is not anticipated to produce a detectable change in flow conditions based upon the size of the walls and fill restricted to between existing bents. Riprap will be placed at two bents; however, all riprap will be below the creek surface and natural cobble will be placed above the infill walls to return the creek surface to pre-project conditions. The infill walls will result in a negligible loss to subsurface creek habitat, but will not result in a change to the surface, substrate, grade, or flow conditions. Therefore, no permanent indirect effects are anticipated to occur to EFH or species managed by the Pacific Coast Salmon FMP as a result of the proposed Action. No changes to fish passage are anticipated.

Riprap will be placed within the riparian woodland habitat to prevent further erosion of the banks at the stormdrain outfall, and will not enter the creekbed. The stream channel and banks will be restored to near pre-project conditions following the completion of bridge work, which includes recreating the streambed gradient that currently exists. Restoration will use previously excavated cobble and gravel substrate to mimic the channel conditions prior to excavation, including creek gradient. As such, the project will not change fish passage conditions.

6.5. Conclusions

Caltrans has determined that the proposed action will not permanently adversely affect EFH for Pacific Salmonids. The proposed project is not anticipated to adversely affect EFH and permanent project impacts would be discountable. The project will result in temporary disturbance to EFH and result in a minor loss of EFH; however, it is a negligible amount and is not anticipated to result in a detectable indirect adverse effect to salmonid species. No changes in flow conditions are anticipated and fish passage conditions will remain unchanged, and the Action Area and the greater San Anselmo Creek watershed does not contain habitat occupied or used by Chinook or Coho salmon species. Therefore, the proposed project will have a **minor, temporary adverse effect** to Pacific Salmonid EFH.

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Appendix A Database Review

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2016-SLI-1012
Event Code: 08ESMF00-2018-E-02854
Project Name: Creek Road Bridge Seismic Retrofit Project

January 23, 2018

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2016-SLI-1012

Event Code: 08ESMF00-2018-E-02854

Project Name: Creek Road Bridge Seismic Retrofit Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Creek Road Bridge (Caltrans Bridge No. 27C-0144) over San Anselmo Creek, in the Town of Fairfax, California was constructed in 1929. The bridge is a 4-span reinforced concrete structure, made up of four sets of reinforced concrete T-girders per span. Due to its seismic vulnerabilities, the bridge has been labeled as a Category 1 Bridge, implying that it would fail catastrophically under the Maximum Credible Earthquake (MCE), potentially resulting in the loss of life. Retrofit concepts and costs to address the bridge's seismic deficiencies were presented in a Seismic Retrofit Report submitted to Caltrans. For retrofit repairs, Caltrans approved Alternate 2 of the Seismic Retrofit Strategy Report. Retrofit work involves construction of infill walls, repairing columns and bent caps, repairing of the deck surface, and abutment stabilization from the roadway side of the bridge (outside of the creek bed). Work will be conducting during one dry season only (April 15 - October 15).

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.98329956491397N122.59091674093092W



Counties: Marin, CA

Endangered Species Act Species

There is a total of 18 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover *Charadrius alexandrinus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Mission Blue Butterfly *Icaricia icarioides missionensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6928	Endangered
Myrtle's Silverspot Butterfly *Speyeria zerene myrtleae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6929	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Flowering Plants

NAME	STATUS
Marin Dwarf-flax *Hesperolinon congestum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5363	Threatened
Santa Cruz Tarplant *Holocarpha macradenia* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6832	Threatened
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
White-rayed Pentachaeta *Pentachaeta bellidiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7782	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Intersection of USGS Topographic Quads with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species Data
NMFS Species List - November 2016

Quad Name	Bolinas	Novato	San Geronimo	San Rafael
Quad Number	37122-H6	38122-A5	38122-A6	37122-H5

X = Present on the Quadrangle

ESA ANADROMOUS FISH (E) = Endangered, (T) = Threatened

COHO		CHINOOK			STEELHEAD					Eulachon (T)	Southern DPS Green Sturgeon (T)
SONCC (T)	CCC (E)	CC (T)	CVSR (T)	SRWR (E)	NC (T)	CCC (T)	SCCC (T)	SC (E)	CCV (T)		
	X					X					X
	X					X					X
	X					X					
	X		X	X		X			X		X

ESA ANADROMOUS FISH CRITICAL HABITAT

COHO		CHINOOK			STEELHEAD					Eulachon	Southern DPS Green Sturgeon
SONCC	CCC	CC	CVSR	SRWR	NC	CCC	SCCC	SC	CCV		
	X					X					X
	X					X					X
	X					X					
	X			X		X					X

Intersection of USGS Topographic Quads with NOAA Fisheries ESA Listed Species, Critical Habitat, Essential Fish Habitat, and MMPA Species Data
NMFS Species List - November 2016

Quad Name	Bolinas	Novato	San Geroni	San Rafael
Quad Number	37122-H6	38122-A5	38122-A6	37122-H5

X = Present on the Quadrangle

ESA MARINE INVERTEBRATES		ESA MARINE INVERT. CRITICAL HABITAT	ESA SEA TURTLES				ESA WHALES	ESA PINNIPEDS	ESA PINNIPEDS CRITICAL HABITAT
Black Abalone (E)	White Abalone (E)	Black Abalone	East Pacific Green Sea Turtle (T)	Olive Ridley Sea Turtle (T/E)	Leatherback Sea Turtle (E)	North Pacific Loggerhead Sea Turtle (E)	Whales (see list below)	Guadalupe Fur Seal (T)	Steller Sea Lion
X		X	X	X	X		X	X	
X		X	X	X	X		X	X	

ESSENTIAL FISH HABITAT					MMPA SPECIES	
SALMON		Groundfish	Coastal Pelagic	Highly Migratory Species	MMPA Cetaceans (see "MMPA Species" tab for list)	MMPA Pinnipeds (see "MMPA Species" tab for list)
Coho	Chinook					
X	X	X	X		X	X
X	X	X	X			
X	X					
X	X	X	X		X	X

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Bolinas (3712286) OR Novato (3812215) OR San Geronimo (3812216) OR San Rafael (3712285))
 AND Federal Listing Status IS (Endangered OR Threatened OR Proposed Endangered OR Proposed Threatened OR Candidate OR Delisted)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Alopecurus aequalis var. sonomensis Sonoma alopecurus	PMPOA07012	Endangered	None	G5T1	S1	1B.1
Callophrys mossii bayensis San Bruno elfin butterfly	IILEPE2202	Endangered	None	G4T1	S1	
Castilleja affinis var. neglecta Tiburon paintbrush	PDSCR0D013	Endangered	Threatened	G4G5T1T2	S1S2	1B.2
Charadrius alexandrinus nivosus western snowy plover	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	SSC
Hesperolinon congestum Marin western flax	PDLIN01060	Threatened	Threatened	G1	S1	1B.1
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
Pentachaeta bellidiflora white-rayed pentachaeta	PDAST6X030	Endangered	Endangered	G1	S1	1B.1
Rallus obsoletus obsoletus California Ridgway's rail	ABNME05016	Endangered	Endangered	G5T1	S1	FP
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Reithrodontomys raviventris salt-marsh harvest mouse	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	SSC
Syncaris pacifica California freshwater shrimp	ICMAL27010	Endangered	Endangered	G2	S2	
Trifolium amoenum two-fork clover	PDFAB40040	Endangered	None	G1	S1	1B.1

Record Count: 16

Appendix B Action Area Photographs



View of the downstream side of Creek Road Bridge showing the stormdrain outfall on the southeast bank. Photo taken on April 1, 2015.



View from the northeast bank of the bents and creekbed to be excavated. Photo taken on April 1, 2015.



View upstream and of the northern bridge abutment and northwestern bank. Photo taken on April 1, 2015.



View downstream and of the northeastern bank. The bank is contains riprap and is most likely the route to be used for crew access to the creekbed. Photo taken on April 1, 2015.

Appendix C Preparers Qualifications

Kelly Biological Consulting
5San Anselmo, CA 94960
(415) 482-9703

P.O. Box 1625
Truckee, CA 96160
(530) 582-9713

CAPABILITIES

Kelly Biological Consulting is a WBE certified, small business experienced in conducting wetland delineations and special status plant surveys, creating vegetation maps, preparing permits, mitigation plans, and the vegetation sections of CEQA and NEPA environmental documents. The firm's primary goals are responding to client needs and providing top quality work using the knowledge that comes from years of experience. Kelly Biological Consulting subcontracts wildlife and fisheries biologists to offer a full range of biological services.

PRINCIPAL

Micki Kelly, Principal, Plant Ecologist
Professional Wetland Scientist (Certification #001007)

- Experienced in conducting plant surveys and wetland delineations in a wide variety of habitats.
- Managed the wetland permitting tasks for construction of a gas transmission line that crossed over 200 wetlands and "other waters" in California, Oregon, and Nevada. Negotiated with 3 U.S. Army Corps of Engineers Districts, 5 Regional Water Quality Control Boards, and other agencies pursuant to the Clean Water Act Sections 401, 402, and 404, and the Porter Cologne Act.
- Taught plant identification and ecology for the U.S. Army Corps of Engineers wetland delineation 40-hour training program. Also taught a class in Sierra Nevada flora and special status plants.
- Designed and implemented a monitoring plan that provided accurate comprehensive data while controlling costs for the 230-mile Tuscarora Gas Transmission Line and the 164-mile Alturas Intertie Project.
- Developed and implemented two large-scale off-site wetland mitigation areas.
- Received written commendation from the U.S. Army Corps of Engineers and California Department of Fish and Wildlife on a wetland permit and mitigation plan for a project in the Sierra foothills involving a Section 7 consultation.

Ms. Kelly has 25 years of relevant experience, successfully managing multi-faceted projects with wetland and endangered species issues, supervising staff and subcontractors. She completes projects on time and within budget. She studied plant ecology, taxonomy, and statistics at the University of Michigan, San Francisco State University, and the University of California, Berkeley. She has taught plant identification and ecology for the U.S. Army Corps of Engineers wetland delineation 40-hour training program. Prior to establishing Kelly Biological Consulting in 1994, she worked as a plant ecologist for WRA, CH2MHill, and Harding Lawson Associates.

Ms. Kelly has conducted sensitive plant species surveys and written impact and mitigation texts for California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) documents and as well as baseline information on restoration sites. She is experienced in designing sensitive plant surveys in accordance with the current California Native Plant Society and the California Department of Fish and Wildlife guidelines. She has conducted vegetation studies in habitats ranging from coastal salt marsh to foothill riparian and montane meadows in California and Nevada. She has extensive experience in designing suitable search patterns based on the desired level of intensity. Ms. Kelly has prepared biological assessments and developed special status plant mitigation and monitoring plans requiring substantial understanding of plant ecology.

Ms. Kelly has performed wetland assessments and delineations on numerous projects including complex filled and excavated problem wetlands, montane areas, farmed wetlands, two diked historic salt marshes that were over 1,000 acres, numerous small emergent wetlands, several 2,000+ acre sites in the Sierra Nevada, alkali playas, foothill riparian zones, and coastal salt marsh restoration sites. Ms. Kelly has expertise in Army Corps of Engineers approved sampling techniques and the data analysis that is used in performing routine and comprehensive delineation. She has developed and implemented wetland monitoring plans using the techniques currently known to be the most successful in wetland mitigation design and construction.

Ms. Kelly has extensive experience in the legal aspects of sensitive species and wetland protection. She has authored Army Corps of Engineers Permits involving Section 7 consultations, one of which received written commendation from the Army Corps of Engineers and Department of Fish and Game.

EDUCATION

BS Botany, University of Michigan
Graduate studies, University of California Berkeley and San Francisco State University

PROFESSIONAL SOCIETIES

Society of Wetland Scientists, Certified Professional Wetland Scientist
California Native Plant Society, Past Marin Chapter Board Member (8 years)
Society for Ecological Restoration
California Botanical Society
California Native Grass Association
California Invasive Plant Council (Cal-IPC)

REPRESENTATIVE PROJECTS

Project: Central Marin Police Station, Larkspur, CA
Client: Central Marin Police Authority

The Twin Cites Police Authority was planning to rebuild their police station when concerns about the existing storm drain outfalls and bank stability arose. Initial building construction was pending. Therefore, the first challenge was obtaining the federal and state permits quickly, even though sensitive brackish marsh habitat was adjacent to the site. Kelly Biological Consulting was able to conduct the wetland delineation and special status species surveys, and expedite the permits within the project deadlines. The second challenge was the site constraints (physical and biological). The site is on the outside bank of a ninety-degree bend in the creek, at the junction of freshwater and tidal flows. It is subject to large hydraulic forces in the winter and high salinity in the summer. In conjunction with the project geotechnical firm and the engineers, Ms. Kelly developed a restoration

design that successfully addressed the difficult site conditions. Ms. Kelly is currently conducting the wetland monitoring.

Project: Doherty Drive, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works rebuilt Doherty Drive and replaced storm drain outfall structures to address flood control and other road problems. In addition, they incorporated an NTTP bike path. One of the challenges of the project was dealing with construction within brackish marsh habitat where special status species are known to occur, while working within a tight schedule. Kelly Biological Consulting conducted a wetland delineation and botanical studies. The firm prepared the permit applications, and negotiated with the regulatory agencies with the goal of constructing the outfalls in a timely, cost effective manner. Construction was completed with positive reviews from the agencies.

Project: Alexander Avenue Bridge Retrofit/Rehabilitation, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works retrofitted and rehabilitated the Alexander Ave. Bridge. Kelly Biological Consulting provided pre-construction monitoring which was conducted by WRA as a subcontractor. Ms Kelly also negotiated with California Department of Fish and Wildlife regarding tree removal and planted acorns as mitigation for tree removal.

Project: Doherty Drive Bridge Replacement, Larkspur, CA
Client: Larkspur Department of Public Works (partially funded by Caltrans)

The Larkspur Department of Public Works replaced Doherty Drive Bridge. The project required construction within brackish marsh habitat and a creek where special status species are known to occur. Kelly Biological Consulting provided construction monitoring with WRA as a subcontractor. Due to schedule issues, the project required working within protected species work windows. Ms Kelly negotiated with the regulatory agencies with the goal of completing construction to avoid the additional impacts to the community that would have occurred had construction been halted until the following season.

Project: Highway Interchange, San Benito, CA
Client: Subcontractor to WRA

A proposed project required the evaluation of potential interchange alternatives. The site was near the Pajaro River. Kelly Biological Consulting conducted the special status plant surveys and contributed to preparation of the NES.

Project: Caltrans Marin Narrows Road Widening, Marin County, CA
Client: Subcontractor to WRA

Kelly Biological Consulting conducted a wetland delineation for the proposed Highway 101 widening in Marin as a subcontractor to WRA and CH2MHill. Work included field analysis, report and map preparation, and supervising WRA and CH2MHill staff. The most challenging element of the work was addressing SWANCC and Rapanos issues along a highway that had highly altered hydrology.

Project: U.S. Army Corps of Engineers Wetland Training Class, CA
Client: San Francisco State University

Ms. Kelly has taught the plant ecology portion of a wetland delineation class. The students learned the basic elements of plant identification, methods for determining wetland status, dominant species, and the wetland-upland boundary.

Information on additional projects available on request.



DANIEL CHASE, MS

Associate
Fisheries Biologist
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o: 415.524.7252
c: 707.363.5045

Years of Experience: 10

Education

MS, Physiology and Behavioral Biology, San Francisco State University, 2014

BS, Conservation and Resource Studies, University of California, Berkeley, 2005

Professional Affiliations/ Certifications

USFWS Recovery Permit for Tidewater Goby (TE-237061)

CDFG Scientific Collectors Permit (#8472)

Transportation Worker Identification Credential (TWIC)

American Association for the Advancement of Science

Specialized Training

40-Hour HAZWOPER Training

Fish Passage Design & Engineering Workshop, CDFG, NOAA Fisheries

Backpack Electrofishing: Principles and Practices

Freshwater Fish Identification – Biology, Ecology & Morphology

During his time with WRA, Dan has managed and worked on a diversity of fisheries and wildlife related projects including permitting, endangered species consultation, protocol level surveys, habitat evaluation and assessments, rescue and relocation, and monitoring. He has extensive experience with fisheries related issues throughout California, and currently holds a Recovery Permit from the U.S. Fish and Wildlife Service (USFWS) for tidewater goby. His technical expertise includes fisheries ecology, fish passage evaluation, geomorphic surveying, special status species surveys, habitat assessments, and eelgrass surveys. Dan's environmental work experience prior to starting with WRA includes fisheries and wildlife work in southern California, eelgrass work in Washington, and oil spill response in the Gulf of Mexico.

Dan has experience with environmental permitting including Endangered Species Act Section 7 and Essential Fish Habitat consultation, California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreements, CDFW Incidental Take Permits (2081), and biological resource assessments prepared for the California Environmental Quality Act (CEQA). His experience includes the preparation of technical documents and implementation of permit compliance, mitigation, and monitoring requirements for these permits. Dan has experience with special status species including: longfin smelt, tidewater goby, steelhead, Chinook salmon, Santa Ana sucker, unarmored threespine stickleback, California red-legged frog, California tiger salamander, burrowing owl, clapper rail, black rail, Swainson's hawk, Bay checkerspot butterfly, Callippe silverspot butterfly, pool fairy shrimp, and tadpole shrimp.

Representative Projects

County of Santa Clara, Bridge Scour Natural Environmental Studies, Santa Clara County, California

Twelve bridge locations within Santa Clara County were identified by Caltrans as having critical abutment scour necessitating repair. The Santa Clara County Roads and Airports Department, with funding from Caltrans, is completing the repairs, working with the Caltrans Office of Local Assistance. To complete these repairs, each bridge site was required to complete a Natural Environment Study (Minimal Impact) (NES MI) to evaluate the potential for impacts to biological resources, analyze permit requirements, and describe avoidance, minimization, and mitigation measures. Dan served as a lead biologist and his project work included site visits, design of mitigation and avoidance measures, and agency coordination in the preparation of the documents. Once permits were issued, including a National Marine Fisheries Service Biological Opinion, he lead fish salvage crews during dewatering activities.

Old Canyon Road Bridge Scour Repair Biological Surveys and Permitting, Fremont, California
WRA is teaming with David J. Powers & Associates and Schaaf & Wheeler to complete the environmental review and permitting studies necessary to repair scour on a bridge across Alameda Creek in Fremont, California. Alameda Creek is not currently an anadromous fish stream, but restoration will begin in 2014 to construct fish ladders and return anadromous steelhead to Alameda Creek. The Old Canyon Road Bridge currently presents a low-flow fish passage barrier due to the presence of poured concrete in the creek bed beneath the bridge. The bridge scour repair will remove the concrete and install rock protection around the bridge abutments. WRA prepared Caltrans biological resources documentation for the project and engaged with the National Marine Fisheries Service in a Technical Assistance for concurrence that the design would not be detrimental to fish passage once the downstream fish ladders had been completed. WRA worked with the project engineers to assess potential fish passage issues at the bridge and to develop plans for fish passage that meet the National Marine Fisheries Service and California Department of Fish and Wildlife standards for fish passage. Dan was the project lead fisheries biologist for WRA and was involved in the preparation of environmental documentation and resource agency permit applications.

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California
Marine vessels and barges are brought to the dry docks at the former Mare Island Naval Shipyard to be serviced and repaired. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to salvage (rescue) stranded fish from the dry dock. Dan serves as project manager and lead fisheries biologist. He is responsible for leading field crews, coordinating with resource agency personnel, ensuring permit compliance, and authoring technical reports following each salvage event. He has also led consultation meetings, prepared biological assessments for the NMFS and USFWS permits, and assisted with amending an existing CDFW permit to reduce mitigation requirements for the dry dock. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, Chinook salmon and green sturgeon at this site. This project is ongoing.

Pastori Avenue Bridge Outfall, Marin County, California
Dan served as the lead fisheries biologist for a bank stability and outfall project in San Anselmo Creek within the town of Fairfax. Project work included a multi-day fish rescue and relocation under the authorization of a NMFS Biological Opinion. Several juvenile steelhead were successfully relocated out of the work area prior to the initiation of construction. During project work, Dan identified the invasive New Zealand mudsnail in the creek, which had previously not been documented for this watershed. NMFS and CDFW were notified of the occurrence.

Caltrans Southern California Lagoon Study, San Diego County, California
California Department of Transportation is analyzing impacts and potential sources of mitigation for sensitive species and habitat for the Interstate 5 widening in San Diego County. As part of an analysis for increases in tidal inundation, Dan participated in wetland assessments and led field crews in biological assessments and topographic surveys within six coastal lagoons in northern San Diego County. During the biological assessments, several coastal California gnatcatcher pairs were identified and suitable breeding habitat for the species was mapped. The second phase of this project, which involves computer based simulation and analysis of increased tidal inundation, is ongoing.

Salmonid Habitat Assessment and Relocation in California
Dan has worked on several projects designed to assess potential habitat for salmonid species. Survey techniques include CDFG protocol level stream habitat assessment, red and carcass spawning surveys, substrate composition and permeability sampling, geomorphic surveys, water quality sampling and analysis, various forms of netting and trapping, and snorkel surveys for identification purposes. Survey work has been conducted in Napa, Sonoma, Shasta, Santa Clara, Monterey, San Luis Obispo, Santa Barbara, Ventura, and Kern Counties.

Permanente Quarry Aquatic Baseline, Santa Clara County, California
Permanente Quarry is a 3600 acre property located in western Santa Clara County at the northern extent of the Santa Cruz Mountains. As part of the quarry's planned expansion, Dan designed and implemented a study of the habitat and aquatic fauna of two headwater creeks on the property. The following field studies were completed as part of this work: fish were surveyed by seine and visually to determine species composition, distribution and relative abundance; nocturnal time-constraint visual encounter surveys were employed to document amphibian species composition, distribution and relative abundance; benthic macroinvertebrates (BMI) were sampled at eight representative locations in accordance with the California Stream Bioassessment Procedure (CSBP). The collected BMIs were sorted by taxa and the data analyzed according to accepted metrics; and a detailed physical habitat study was conducted to quantify the condition and value of the current aquatic habitat. A technical report was completed that will serve as a baseline of the available habitat and existing fauna within the two watersheds.

Grady Ranch Creek Restoration and Permitting, Marin County, California
As part of a proposed Grady Ranch Development in Marin County, a large scale creek restoration and fish passage improvement was designed and permitted. WRA provided biological services which included fish passage assessment, habitat mapping, fisheries surveys, California red-legged frog protocol level surveys, design review, agency consultation, permitting, and the preparation of long term monitoring plans. Dan served as the lead fisheries biologist for the project, and was involved with biological surveys, fish passage assessments, habitat mapping, consultation, and prepared a biological assessment to support the projects permits. While the project never went to construction, the restoration design was the process of receiving approval from the resource agencies.

Fish Passage Assessment in California
Dan has worked with several teams on the identification and assessment of fish passage barriers for anadromous species, which involved onsite qualitative habitat analysis and quantitative data collection utilizing a Total Station Survey Instrument. His survey work and professional assessments have been used as supplemental components to technical reports and as part of a state wide database that is in process for Caltrans. Fish passage assessments have been performed in various watersheds of Marin, Contra Costa, Monterey, Santa Barbara, Ventura and Los Angeles Counties.

Santa Clara River Estuary Habitat Restoration and Enhancement Feasibility Study, Ventura County, California
A Fisheries Restoration Grant Program through CDFW funded a feasibility study and conceptual design development for the restoration of estuarine fish habitat along the Santa Clara River Estuary. Following the preparation of an existing conditions technical report, stake holder outreach and restoration designs were crafted to focus on the conversion of an existing developed campground back to higher quality estuarine habitat. The campground would then be relocated from its current footprint. Dan served as the project manager and lead biologist. His work included a habitat assessment, report preparation, design review, participation in outreach meetings, and team management. The final feasibility report for the preferred concept will be released in 2015.

Napa Dry Bypass Flood Control, Napa County, California
As part of a comprehensive flood control program for Napa County, a high flow bypass channel and creek restoration at the confluence of Napa Creek and Napa River was constructed in downtown Napa. Dan served as the project's lead fisheries biologist, which involved fish rescue and relocation, otter trawl fish sampling, fish exclusion, pile driving monitoring, and daily construction checks. He also assisted Napa County Flood Control District with a permit amendment to the project's CDFW Incidental Take Permit. The completion of the dry bypass project resulted in increased flood capacity and improved habitat conditions for special-status fish including steelhead and longfin smelt.

Marin County Public Works Fisheries Services, Marin County, California
Marin County Department of Public Works (MCDPW) underwent maintenance sediment removal at multiple culverts in West Marin. WRA provided biological support services for the sediment removal, which included pre-construction California red-legged frog surveys, environmental training, fish rescue and relocation and biological monitoring. During fish relocation, tidewater goby was encountered in an area they had not previously been documented to occur. Following the project work, WRA prepared a supplemental biological assessment of tidewater goby addressing sediment removal activities for MCDPW. Dan served as the project manager, lead fisheries biologist, and authored the supplemental biological assessment.

Callippe Preserve, Pleasanton, California
The Callippe Preserve was established as mitigation for the construction of the Pleasanton Municipal (Callippe) Golf Course. As a component of the wildlife management plan and USFWS Biological Opinion, Dan has conducted hydrological monitoring, annual sampling for California Tiger Salamander, and required predator monitoring and removal within the Preserve Conservation Areas. In 2009, Dan discovered a new population of California red-legged frog within a Preserve Conservation Area pond. Predator removal via hand capture, hook and line, gigging, shooting, and dipnet capture continued throughout 2009 and 2010. Successful breeding of California red-legged frog was confirmed in 2010. In October 2010, Dan, with approval of the USFWS and the landowner, dewatered the pond using a gasoline-powered trash-pump to rid it of bass and bullfrogs. Monitoring is ongoing, however California red-legged frog breeding success is expected to improve in 2012. In the fall of 2013, non-native predatory fish were detected in the golf course irrigation ponds. Dan assisted with draining the ponds and eradicate the fish in compliance with the USFWS Biological Opinion and associated management plans. Dan assisted with the captured and retention of 22 CRLF during the dewatering. CRLF were released back into the irrigation ponds as soon as refilling resumed.

Frenchman's Creek Water District, San Mateo County, California
Frenchman's Creek Water District (FCWD) is a small water service provider located north of Half Moon Bay along coastal San Mateo County. A CDFW 1602 permit allows for the temporary installation of a flashboard dam and water withdrawal from the system. Dan serves as the fisheries biologist for this project and the FCWD, which involves monitoring flow and habitat conditions during the diversion period, permit compliance, and annual reporting. This project is currently ongoing.

Potrero Creek Restoration Carmel, California
Dan helped design, manage and implement the restoration of Potrero Creek, in the Carmel Valley, California. A large landslide altered the existing channel and was undermining a road. Dan aided with the design to restore the previous channel alignment and use the altered channel as a high water channel which would provide rearing habitat for steelhead and California red-legged frog. He conducted environmental training for the workers, pre and post restoration geomorphic surveys, served as the onsite biological monitor and restoration manager during construction, and assisted with the permitting of the project.

Draper Inverness Dock Permitting, Marin County, California
In accordance with permit requirements of USFWS and NMFS, Dan performed pre-construction eelgrass surveys at a dock replacement project in Tomales Bay. Dan also performed daily construction monitoring for all inwater work, conducted environmental sensitivity training to on-site construction staff, and monitored environmental permit compliance for the project. Construction involved removal of creosote piles and installation of eelgrass friendly deck grating that allows light to penetrate beneath it. Following the construction of the dock, Dan led annual monitoring work to document the project effect on the eelgrass bed. Monitoring was completed in 2012 when the eelgrass bed was confirmed to have recovered to pre-construction conditions.



PATRICIA VALCARCEL, MS

Wildlife Biologist

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Years of Experience: 9

Education

MS, Wildlife Sciences, Oregon State University, 2011

BA, Environmental Sciences, Northwestern University, 2003

Professional Affiliations/ Certifications

USFWS Recovery Permit for giant gartersnake and San Francisco gartersnake (TE-64146A)

California Department of Fish and Wildlife Scientific Collecting Permit

The Wildlife Society

Specialized Training

- Biology and Management of the Alameda Striped Racer, Alameda County Conservation Partnership, May 2014
- San Joaquin Kit Fox Ecology, Conservation, and Survey Techniques, Central Coast Chapter of The Wildlife Society, Summer 2013
- Swainson's Hawks in California's Central Valley, Sacramento-Shasta Chapter of The Wildlife Society, Spring 2012
- Workshop on the Biology and Conservation of the California Tiger Salamander, Alameda County Conservation Partnership, June 2012
- Amphibian Inventory and Monitoring Protocol, Northwest Partners in Amphibian and Reptile Conservation, Spring 2011

Patricia Valcarcel earned a MS in Wildlife Sciences while conducting research on the spatial ecology of the threatened giant gartersnake. She has worked on a variety of field research projects ranging from animal movements to behavior and reproduction. She has presented her work at many conferences and published in peer-reviewed journals.

Patricia has extensive experience working with giant gartersnakes in the Sacramento Valley and assisted with mark-recapture surveys for San Francisco gartersnakes in San Mateo County. She has performed surveys and other activities related to California red-legged frog in Alameda, San Mateo, Los Angeles, Solano, and Sonoma Counties. Patricia also has extensive experience throughout California's Central Valley including protocol-level surveys for Swainson's hawk, burrowing owl, and assessments for San Joaquin kit fox and blunt-nosed leopard lizard. In addition, she has conducted observations and coordinated compliance for Pacific herring spawning in San Francisco Bay.

Patricia's primary responsibilities are to conduct surveys, habitat assessments, and write associated biological assessment and technical reports for special-status wildlife species. She has experience with the San Joaquin County Multi-Species Habitat Conservation Plan as one of the on-call biologists for the San Joaquin Council of Governments. In addition, Patricia is involved in environmental permitting, permit compliance, and mitigation and monitoring efforts associated with these permits.

Representative Projects

East Bay Municipal Utility District Mokelumne Aqueduct Project, San Joaquin County, California 2012 – 2013

Recoating of the Mokelumne Aqueduct Phase 8 – Slough Crossing Project will be conducted at four project sites located in San Joaquin and Contra Costa counties. In accordance with permits, a USFWS-approved giant gartersnake biologist is needed to perform pre-construction surveys and compliance monitoring. Patricia holds a USFWS Recovery Permit for giant gartersnake and was approved to perform the pre-construction surveys. She also monitored a Swainson's hawk nest within the Project Area to confirm nesting status of the pair and EBMUD compliance with avoidance measures.

San Joaquin Council of Governments, San Joaquin County, California 2012 – Present

WRA is contracted for on-call services related to the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP). Patricia has performed pre-construction surveys and recommended avoidance and minimization measures to ensure participants are in compliance with the SJMSCP. Wildlife species and habitats Patricia has encountered as part of this work include burrowing owl, California tiger salamander, and Swainson's hawk. In addition, Patricia prepared and consulted with the California Department of Fish and Wildlife on a burrowing owl exclusion plan. Following approval by CDFW, Patricia implemented the exclusion and monitoring plan.

Ridge Top Ranch Wildlife Conservation Bank, Solano County, California 2012 – 2015
WRA and Ridge Top Ranch, LLC (RTR) are in the process of developing over 280 acres of high quality California red-legged frog and callippe silverspot butterfly mitigation habitat located within Solano County, California. WRA, in consultation with the USFWs and under 10(a)(1)(A) Recovery Permit TE-212445-0, successfully translocated California red-legged frogs to created habitat within the RTR Wildlife Conservation Bank. WRA has been involved throughout the process, from selecting donor sites and planning habitat creation, to translocation of egg masses and monitoring the frogs to ensure that establishment at the receiving site was successful. Through the monitoring phase, Patricia assisted permit-holder Rob Schell in survey efforts, which included egg mass surveys at the donor site, visual counts at the receiving ponds, as well as the capture and handling of juvenile red-legged frogs to measure and install PIT tags. She also conducted a Callippe silverspot butterfly survey as part of annual monitoring efforts. Monitoring at this site is ongoing, and the Conservation Bank is in the final permitting stages.

Napa Valley Marina Permitting and Dredge Monitoring, Napa, California 2012 – Present
The Napa Valley Marina is an active recreational marina along the Napa River near Bull Island. Maintenance dredging of the Marina is necessary for boat access to and from the Napa River. Patricia is involved with a variety of environmental consulting services for the maintenance dredging including preparation of applications for the Dredged Materials Management Office (DMMO) and the California Department of Fish and Wildlife Streambed Alteration Agreement. Maintenance dredging permits included monitoring for special-status species and habitat conditions such as temperature and salinity monitoring for longfin smelt. Patricia oversees monitoring and compliance surveys for the multi-year maintenance dredging project.

Port of Richmond Inner Harbor Maintenance Dredging, Richmond, California 2014 – 2015
Maintenance dredging of the Port of Richmond Inner Harbor Channel was necessary to maintain passageways for the active port. The Pacific herring is a protected fishery, and dredging operations within the Pacific herring spawning season were unavoidable. Patricia was a California Department of Fish and Wildlife approved observer for the Project, and she coordinated a team of observers for the maintenance dredging Project. One spawning event occurred within the Project Area during dredging activities and Patricia consulted with CDFW to establish buffers. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

Bruno's Island Bridge Repair Project, Southwestern Sacramento County, California 2014
Bruno's Island is a small recreational boat harbor located off Andrus Island along the San Joaquin River in the western Delta. Bridge repair activities included sheathing piles within the channel and could potentially affect listed aquatic species. Patricia provided the hydroacoustic analysis and wrote the Section 7 Biological Assessment for Delta smelt, steelhead, and giant gartersnake. Through her work and advising on project design such as strike limits and use of bubble curtains outside of the work windows, a "Not Likely to Adversely Affect" was received from both NMFS and USFWS. This Project was completed in 2014.

12 Bridges, Santa Clara County, California 2012 – 2013
WRA was engaged by the County to prepare Natural Environment Study (Minimal Impact) reports, permitting documents, and Revegetation and Monitoring Plans for twelve bridges with critical abutment scour located throughout Santa Clara County, California. Patricia aided in the preparation of the Section 7 Biological Assessments for six of the bridges which incorporated California red-legged frog, California tiger salamander, Least Bell's vireo, and salmonid species. Based on those plans, she has conducted the pre-construction surveys and biological monitoring required by the U.S. Fish and Wildlife Service Biological Opinion in 2012 and 2013 work seasons.

Burrowing Owl Surveys and Passive Exclusion, Legacy on 101, San Jose, California 2014
The Legacy on 101 project is a 16.35 acre property in Santa Clara, California that is to be developed into two 6-story industrial park/office/R&D buildings. The area is known to support burrowing owl, and a series of take avoidance surveys was conducted from 2008 to 2014. Patricia observed one burrowing owl occupying the property in 2014. Patricia developed the exclusion and monitoring plan submitted to CDFW. During the non-nesting season, she passively excluded the owl and excavated all potential burrows at the site. Patricia conducted monitoring at the site every other week until construction activities were initiated and performed a pre-construction survey immediately prior to grading, per the exclusion plan.

Napa Dry Bypass, Napa, California 2014
The Napa Dry Bypass is designed to divert 100 year flows around the oxbow reach to avoid flooding the Soscol Gateway area in downtown Napa. Patricia is a CDFW-approved biologist for this Project, and Patricia has been involved with this project by monitoring compliance and construction activities during excavations of the new river channel, as well as assisting with fish rescues within the coffer dams. Project permits include Biological Opinions from National Marine Fisheries Service and California Department of Fish and Wildlife Incidental Take Permits for steelhead (Central California Coast DPS), Delta smelt, and longfin smelt.

Marin County Department of Public Works Flood Control Line Replacement, San Rafael, California 2013
The Marin County Department of Public Works manages flood control projects throughout the county, including the city of San Rafael. The project consists of replacing an aging flood diversion pipe in a low-lying residential area adjacent to the south fork of Gallinas Creek. The project area is located in a salt marsh slough and has known populations of California clapper rail and salt-marsh harvest mouse. Patricia was a USFWS-approved biological monitor for the project and has monitored construction to ensure compliance with the project's regulatory permits. Several California clapper rails were observed at short range and within the project area, and Patricia stopped work activities until the birds had safely left of the own volition.

Fitzgerald Marine Reserve Coastal Trail, San Mateo County, California 2012 – 2013
The Fitzgerald Marine Reserve project includes the design of a portion of the California Coastal Trail in San Mateo County, California. Major components of the project, in addition to the multi-use trail, included a free span pedestrian bridge and improved beach access and overlook. WRA provided environmental services in support of the proposed trail and public access improvements, and existing sensitive habitats were avoided to the extent possible in the public access design. WRA prepared the conceptual designs for the trail and improved access to the overlook and beach, performed wetland delineations, completed biological surveys, and prepared permit applications. As part of this process, Patricia was approved by the U.S. Fish and Wildlife Service under the Biological Opinion for the project to perform the pre-construction surveys and monitoring for San Francisco gartersnake and California red-legged frog. In addition, she provided advice on the design and materials for the wildlife exclusion fence, and oversaw its installation.



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Years of Experience: 3

Education
BS Wildlife, Fish and Conservation Biology, UC Davis, 2012

Professional Affiliations/ Certifications

American Fisheries Society

Nick holds a B.S. degree in Wildlife, Fish and Conservation Biology from the University of California, Davis. His coursework included ichthyology, mammalogy, ornithology, waterfowl and wetland management, population dynamics and invasive plant ecology.

Prior to joining WRA, Nick worked as a biological monitor on a transmission line project where he gained experience working with California tiger salamander, western spadefoot toad and nesting birds. In addition, he worked for two years as a Fisheries Technician in both the private and public sector. His work primarily revolved around population monitoring, invasive species removal, water quality and habitat assessments. He has worked extensively with Lahontan cutthroat trout and native species of the Sierra Nevada Mountains. Nick has also worked with the UC Davis Museum of Wildlife and Fish Biology and performed a cursory study on small mammal distribution throughout the state of North Dakota. He conducted live-trapping and collected specimens for the museum. The data collected was presented to the museum and the Smithsonian Institute in support of follow-up studies.

With WRA, Nick conducts fish salvages, habitat assessments, biological monitoring, focused wildlife surveys, and writes biological assessment reports. He has trained with Rob Schell, a U.S. Fish and Wildlife Service Recovery Permit holder for California red-legged frog (CRLF); Jason Yakich, Recovery Permit holder for California clapper rail (CCR); and Kate Allan, Recovery Permit holder for salt marsh harvest mouse (SMHM).

Representative Projects

Amy's Kitchen, Rohnert Park, California, 2014 – Present
During construction of facilities for Amy's Kitchen in Rhonert Park, Nick was approved by CDFW as a biological monitor for California tiger salamander (CTS). During the course of the project, Nick monitored for environmental compliance at the site to assure that there was no take of covered species during construction. To date, no take of CTS has occurred.

Port of Richmond Inner Harbor Maintenance Dredging, Richmond, California 2014 – 2015
Maintenance dredging for the Port of Richmond Inner Harbor Channel was conducted in the winter of 2014 to maintain passageways for ships entering the port. Pacific herring is a protected fishery, and dredging operations within the harbor overlapped with the Pacific herring spawning season. Nick was an approved California Department of Fish and Wildlife observer for the Project. During operations, one spawning event occurred within the Project Area. Nick observed the spawning event and informed crews on the required buffers to maintain compliance. All Project activities were completed in compliance with the Project's Pacific Herring Work Window Waiver.

Mare Island Ship Yard Dry Dock Fish Salvage, Vallejo, California 2014, - Present
Mothballed vessels from the National Defense Reserve Fleet in Suisun Bay and private ships needing repair are brought to the dry docks at the former Mare Island Naval Shipyard. In accordance with permit requirements of USFWS, National Marine Fisheries Service (NMFS), and CDFW, biologists are required to be present during final stages of dewatering to salvage (rescue) stranded fish from the dry dock. Captured fish are placed in aerated holding coolers, identified to species, counted and measured before being returned to the Mare Island Channel of the Napa River. Nick is a lead fisheries biologist for this operation. He is responsible for leading a team of biologists who conduct salvage operations. He also coordinates with resource agency personnel, ensuring permit compliance, and writes technical reports following each salvage event. He is authorized to handle and relocate longfin smelt, Delta smelt, steelhead, Chinook salmon and green sturgeon at this site. This project is ongoing.

Healdsburg Veterans Memorial Dam Spillway Repair, Healdsburg, California, 2014
The Healdsburg Veterans Memorial Dam is a flashboard dam located within the city of Healdsburg on the Russian River. The dam is installed seasonally to create a temporary recreational lake. For this project, Nick was approved as the lead fisheries biologist, and biological monitor. He conducted pre-construction surveys for breeding birds as well as pacific pond turtle (PPT), and positively identified PPT in the project area. As the lead fisheries biologist he lead a team of biologists who performed multiple fish salvages within the project area following de-watering events. His team successfully identified, and safely re-located steelhead that were salvaged during the dewatering. Nick also conducted biological monitoring for PPT and special-status fish throughout the duration of the project to ensure that project activities were in compliance with agency permits. He conducted pre-construction checks, environmental trainings, and water temperature monitoring. The project was completed in compliance with relevant permits with no take of any special-status species.

Frenchman's Creek Water District, San Mateo County, 2013 - Present
Frenchman's Creek Water District (FCWD) is a small water service provider located north of Half Moon Bay along coastal San Mateo County. A CDFW 1602 permit allows for the temporary installation of a flashboard dam and water withdrawal from the system. Nick serves as a fisheries biologist for this project, which involves monitoring flow and habitat conditions for steelhead during the diversion period, permit compliance, and annual reporting. This project is currently ongoing.

Napa Dry Bypass, Napa, California, 2014 - Present
The Napa Dry Bypass is designed to divert 100 year flows around the oxbow reach of the Napa River to avoid flooding the Soscol Gateway area in downtown Napa. Nick has been approved as a lead fisheries biologist on this project and has conducted multiple fish salvage operations for longfin smelt, and steelhead. Nick also assisted in the otter trawl surveys and fish exclusion work which were required during impact hammer pile driving operations. He has also been involved with this project by monitoring compliance and construction activities including impact hammer pile driving. In addition, he assisted in the design and implementation of the environmental awareness training program to comply with both the streambed alteration agreement and incidental take permits. This project is ongoing.

Pristine Sun Solar Projects Pre-construction Surveys, California, 2014-Present
WRA was contracted to implement environmental compliance measures for several Pristine Sun projects. Projects involved creating 0.5-1 MW solar generation facilities in Glenn, and Shasta Counties. As part of these measures, Nick performed pre-construction surveys for Swainson's hawk, white-tailed kite, long-eared owl, burrowing owl, and breeding birds at two sites.

APPENDIX C. NOISE STUDY

CREEK ROAD BRIDGE PROJECT CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

Fairfax, California

September 28, 2015

Prepared for:

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INTRODUCTION

The Creek Road Bridge (Caltrans Bridge No. 27C-0144) passes over San Anselmo Creek in the Town of Fairfax, California. A retrofit project has been proposed for this bridge to fortify the substructure. This report presents the results of the construction noise and vibration assessment completed for the retrofit project. The report first presents the fundamentals of environmental noise and vibration for those who may not be familiar with acoustical terminology or concepts, then provides an evaluation of noise and vibration levels resulting from project construction activities. Measures to reduce construction noise levels are recommended.

Fundamentals of Environmental Noise

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Community Noise Equivalent Level (CNEL) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. - 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. - 7:00 a.m.) noise levels. The Day/Night Average Sound Level (Ldn) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Fundamentals of Ground-borne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous vibration levels produce.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at much lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related ground-borne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess ground-borne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building.

Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m.to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

TABLE 3 Reactions of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Virtually no risk of damage to normal buildings
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential dwellings such as plastered walls or ceilings
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to newer residential structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, September 2013.

Regulatory Background - Noise

The proposed project would be subject to noise-related regulations, plans, and policies established within documents prepared by the Town of Fairfax. Applicable planning documents include the Town's General Plan and Municipal Code.

Town of Fairfax General Plan. The Town of Fairfax's General Plan Noise Element establishes goals, policies, and programs for noise and vibration sources. Applicable goals, policies, and implementation measures presented in the General Plan are as follows:

Goal N-3: Maintain the current quality of the acoustical environment.

The fundamental principle of the California Environmental Quality Act (CEQA) as it relates to community noise is to keep new projects from causing a substantial increase in noise that would impact residents and other sensitive receivers. This can be accomplished if impacts are identified as a part of normal project review or through the CEQA process and mitigation measures are incorporated into projects.

Noise from construction activities, and particularly activities associated with the construction of new residences, remodeling or demolition and reconstruction of residential properties, has an adverse effect on the peace and quiet in the Town of Fairfax.

The term "construction" covers a large range of projects ranging from new construction or the demolition and construction of a large residence that could include demolition, site grading, foundation work, framing, roofing, exterior sheeting, and site improvements and landscaping, a project that may last up to two years, to someone repairing a deck on a Saturday afternoon.

The primary method for communicating construction noise management methods to the community could be through a guidance manual and/or design guide. If a major project is expected to take less than 18 months and work would be done following all of the standard controls that would be established, including limiting the work to a certain schedule of allowable days and hours, then the project would be found to cause a less-than significant impact under CEQA. Alternatively, if the project is going to necessitate construction activities that would last beyond 18 months, or occur outside of allowable time periods, then the project would be found to cause a potentially significant impact and would be subject to environmental review under CEQA. The assessment could result in additional mitigation measures, a finding of overriding considerations, or project denial.

The following is a representative list of standard controls:

a. Limit construction to the hours of 8:00 a.m. to 5:00 p.m. on weekdays, and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or holidays.

b. Control noise from construction workers' radios to the point where they are not audible at existing residences that border the Project site.

c. Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment.

d. Utilize quiet models of air compressors and other stationary noise sources where technology exists.

e. Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area.

f. Prohibit unnecessary idling of internal combustion engines.

g. Notify residents adjacent to the Project site of the construction schedule in writing.

h. Designate a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., starting too early, bad muffler) and institute reasonable measures warranted to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site.

Other sources of noise that contribute to the noise environment in Fairfax include aircraft flights, and various neighborhood sources including barking dogs, yard maintenance, garbage trucks, noise generated by other home equipment such as swimming pool pumps and air-conditioners, early morning deliveries, and parties. The Town has little direct control of aircraft operations that may constitute a noise burden to its residents. Hence, most aircraft noise abatement measures must necessarily be affected by seeking cooperation from other government agencies. The Town can manage noise generated within its boundaries.

Objective N-3.1: Establish a noise abatement program that preserves the existing acoustical character of the Town.

- **Policy N-3.1.4:** Implement appropriate standard controls (e.g., some or all of Standard Controls a-h above) for all construction projects.

    > **Program N-3.1.4.1:** Develop a guidance manual to provide information to public regarding construction noise control.

- **Policy N-3.1.5:** Consider CEQA review for construction projects lasting more than 18 months, and submittal of detailed construction noise management plans.

    > **Program N-3.1.5.1:** Develop a guidance manual to provide information to public regarding construction noise control.

Town of Fairfax Municipal Code. The Town's Municipal Code provides provisions for noise control in Chapter 8.20. The portions of the Municipal Code that are relevant for this project are as follows:

Chapter 8.20.010 Policy Declaration; Nuisance Declared.

A. In order to control unnecessary, excessive and annoying noise in the town, it is declared to be the policy of the town to prohibit the noise generated from or by all sources as specified in this chapter. It is the policy of the town to maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the town where noise levels are above acceptable values.

B. It is determined that certain noise levels are detrimental to the public health, welfare and safety, and are contrary to public interest. Therefore, the town does ordain and declare that creating, maintaining, causing or allowing to be created, caused or maintained, any noise in a manner prohibited by or not in conformity with the provisions of this chapter, is a public nuisance. (Prior Code, § 8.16.010) (Ord. 481, passed - -1981)

Chapter 8.20.030 Compliance by Town Departments.

A. All departments of the town shall carry out their activities in accordance with the provisions of this chapter.

B. Each department whose duty it is to review and approve new projects, or changes to existing projects, which result or may result in the emission of noise shall make the finding that the project complies with the provisions of this chapter prior to project approval. (Prior Code, § 8.16.030) (Ord. 481, passed - -1981)

Chapter 8.20.050 Exterior Noise Limits.

A. Maximum permissible sound levels by receiving land use.

1) The noise standards for the various noise zones as presented in the following table shall, unless otherwise specifically indicated, apply to all such property within a designated zone.

2) No person shall operate or cause to be operated any source of sound at any location within the incorporated town, or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by the person, which causes the noise level when measured at the complainant's property line to exceed the limits in the table below for more than seven and one-half minutes in a 15-minute period. Those seven and one-half minutes need not be continuous.

3) If the measured ambient level differs from that permissible, the allowable noise exposure standard shall be adjusted in five-decibel increments in each category as appropriate to encompass or reflect the ambient noise level.

4) If the measurement location is on a boundary between two different zones, the noise level limit applicable to the lower noise zone shall apply.

B. Correction for character of sound.

1) In the event the alleged offensive noise, as judged by the Chief of Police or his or her designated representative, contains a steady, audible tone such as a whine, screech or hum, or is a repetitive noise such as hammering or riveting, or contains music or speech, the standard limits set forth in the table below shall be reduced by five decibels.

2) These zones are illustrated on Exhibit A, "Noise Zones, Town of Fairfax," attached to the ordinance codified in this chapter. Areas that are not covered on the map are included in Zone A. (Prior Code, § 8.16.050) (Ord. 481, passed - -1981; Am. Ord. 529, passed - -1984)

Exterior Noise Limits ***(Levels not be be exceeded more than 7.5 minutes in any 15-minute period)***			
Noise Zone	Time Period		Noise Level (dBA)
A (Residential)	Night	10:00 p.m. - 7:00 a.m.	40
	Day	7:00 a.m. - 10:00 p.m.	50
B (Multiple Dwelling, Residential)	Night	10:00 p.m. - 7:00 a.m.	50
	Day	7:00 a.m. - 10:00 p.m.	55
C (Commercial)	Night	10:00 p.m. - 7:00 a.m.	55
	Day	7:00 a.m. - 10:00 p.m.	60

Chapter 8.20.060 Prohibited Acts.

C. Construction/demolition domestic power tools.

1) The operation of any tools or equipment used in construction or demolition work between weekday hours of 8:00 p.m. and 8:00 a.m. or on weekends or holidays between the hours of 8:00 p.m. and 9:00 a.m., such that the sound therefrom creates a noise disturbance across a residential or commercial real property line, is prohibited.

2) Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool or similar tool between 8:00 p.m. and 8:00 a.m. or on weekends or holidays between the hours of 8:00 p.m. and 9:00 a.m., so as to create a noise disturbance across a residential or commercial real property line, is prohibited.

D. Machinery. Any motor, machinery or pump, such as swimming pool equipment and the like, shall be sufficiently enclosed or muffled and maintained so as not to create a noise or disturbance.

Chapter 8.20.070 Exemptions.

D. The operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work, mechanically powered saw, sander, drill, grinder, lawn or garden tool, leaf blower, or similar tool between 8:00 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. and 8:00 p.m. on weekends are exempt. (Prior Code, § 8.16.070) (Ord. 481, passed - -1981; Am. Ord. 731, passed 2-6-2008)

Existing Noise Environment

The existing Creek Road Bridge is located within a residential development with several single-family residences located in the vicinity of the proposed project site, as shown in Figure 1. Each of these noise-sensitive land uses have the potential to be adversely affected by noise and/or vibration attributable to project construction activities. The main sources of noise at the project site include vehicular traffic along local roadways and the occasional planes that may fly overhead. No airports are located in the vicinity; thus, this noise source is intermittent. Noise measurements were not taken at the project site. However, a noise contour plot in the Town's General Plan shows that the existing noise environment in the vicinity of the project site would typically be characterized by ambient noise levels less than 60 dBA L_{dn}.

FIGURE 1 Proposed Project Site



Construction Noise Assessment

Description of Project Construction Activities

The proposed retrofit construction project for the Creek Road Bridge would be conducted over one permissible dry season (typically from April 15 through October 15) for work in the creek, when the flow is at a minimal level. Additional weeks at each end of this period could possibly include work at the street level. During construction, the bridge would be closed, and traffic would be detoured to other access routes.

Bridge Construction

Construction equipment would include smaller-wheeled vehicles, hand-held devices, cranes, excavators, jack hammers, pickup trucks, dump trucks, concrete delivery trucks, small loaders, and generators. Various combinations of the above equipment would be present at the project site on a daily basis depending on the construction task being undertaken at the time. Storage of construction materials, tools, and vehicles would be limited to Wessen Lane and locations within

the APE. Access to the creek would be by lowering equipment, containers, and materials from the bridge deck using a crane.

The existing bridge would be retrofitted with reinforcements to secure the bridge under Maximum Credible Earthquake (MCE) conditions. This would include seismic anchor slabs at each end of the bridge deck. Infill walls between each pair of columns at each of the three bridge bents in the creek would be constructed as part of the retrofit project. This retrofit would address the seismic brittleness of the cap beams and the columns when the structure moves sideways during the MCE and puts bending and prying forces in these elements. Steel restrainer cables would be attached to the vertical superstructure diaphragms and to the bent cap beam, tying the super- and substructure together and preventing the unseating of the former during MCE. New concrete stoppers would be attached to the face of each bent cap with epoxied dowels, reinforced with steel rebars. This would not only stop the superstructure from sliding sideways (transversely) on the bent caps but also act as a belt-and-suspender system in conjunction with the cable restrainers to limit the longitudinal movements of the girders and preventing their unseating. The concrete spalls located on the underside of the bridge deck slab, the girders, the columns, and the bent cap beams would be repaired. These repairs entail removing the unsound concrete at these locations, cleaning the rust on the reinforcement, and covering the exposed area with special grout. This work would be primarily done on scaffolding and from lifts placed on the creek bed. The asphalt on the bridge deck's travel surface would be removed using a special grinding machine; the deck would be cleaned; the unsound concrete spots would be patched; and the deck would be sealed with methacrylate to fill all the cracks. Finally, the expansion joint seals would be replaced at the three existing bridge deck joints at the bents.

Dewatering

Construction activities would be performed between April 15 and October 15, which would correspond to times when creek flow would be lowest. If water is present in the channel, the flow would be diverted by building a small, temporary dam upstream of the project and directing flow through a pipe to discharge below the project area.

The soils excavated at the bridge supports (Bents 2 through 4), and used for backfill later on, would be lifted and stored above at the project site, likely on Wessen Lane, and not allowed to remain on the creek bed. Ground water intrusion into the work area would be pumped out into special containers, filtered, and placed back in the creek. Bent excavations around the columns to cast infill walls between them would differ at each of the three bents.

Revegetation

Upon the completion of the work in the creek, plant restoration and mitigation work would be implemented. Vegetation disturbed by or removed for construction would be replaced. The approach roadways pavement excavated for the waffle slab construction would be tidied up and restriped before the road would be opened for travel.

Staging and Construction Workers

During construction, a temporary staging area would be established on Wessen Lane and within the APE. The staging area would be used for delivery and storage of construction materials, for fueling and maintenance of equipment, and for contractor parking.

The number of construction-related vehicles traveling to and from the project site would vary on a daily basis. For the purpose of analysis, it is assumed that the peak number of trucks expected on any one day would be approximately eight one-way truck trips per hour, or 64 one-way haul truck trips per day. In addition to haul truck traffic, an average of 40 one-way vehicle trips per day is estimated for the construction crew.

Construction Noise Levels

Noise generated by project-related construction activities would be a function of the noise levels generated by individual pieces of construction equipment, the type and amount of equipment operating at any given time, the timing and duration of construction activities, the proximity of nearby sensitive land uses, and the presence or lack of shielding at these sensitive land uses. Construction noise levels would vary on a day-to-day basis during each phase of construction, depending on the specific task being completed. Each construction phase would require a different combination of construction equipment necessary to complete the task and differing usage factors for such equipment. Construction noise would primarily result from the operation of heavy construction equipment and the arrival and departure of heavy-duty trucks.

FHWA's Roadway Construction Noise Model (RCNM) was used to calculate the maximum and average noise levels anticipated during the construction period (FHWA 2006). This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project of "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Vehicles and equipment anticipated during the construction period for this project were input into RCNM to calculate noise levels at a distance of 50 feet, which is the approximate distance from the construction site to the nearest residence adjacent to the bridge. Other sensitive receptors in the immediate project vicinity range from 55 to 205 feet from the project site.

Construction activities for this project would be conducted over the duration of one permissible dry season (April 15 through October 15) for work in the creek and possibly a few additional weeks at each end of this period for the work at street level. Construction would only occur during daytime hours between 8:00 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. and 8:00 p.m. on weekends and holidays.

Activities associated with the earthwork and retrofit phases of the project would generate hourly average noise levels up to 85 dBA L_{eq} at a distance of 50 feet. Maximum instantaneous noise levels would reach 85 dBA L_{max} at 50 feet. This retrofit project does not include pile driving activities. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of

the distance between the source and receptor; therefore, the noise levels calculated at 50 feet would be about 6 dBA less at 100 feet and 12 dBA less at 205 feet. Shielding provided by buildings or terrain would result in even lower construction noise levels at distant receptors.

Construction-related vehicles traveling to and from the project site would generate worst-hour noise levels of approximately 57 dBA L_{eq} at a distance of 50 feet from the center of Creek Road, assuming that the peak number of trucks expected on any one day would be approximately eight one-way truck trips per hour and that up to 20 one-way vehicle trips would occur per hour for the construction crew.

Although the construction of the proposed project would elevate noise levels at nearby noise-sensitive land uses by 25 dBA or more above ambient daytime conditions, the duration of the project is expected to be approximately 6 months. Construction activities for the proposed project should include the following best management practices, as suggested in the Town's General Plan, to reduce noise from construction activities nearby sensitive land uses:

- Limit construction to the hours of 8:00 a.m. to 5:00 p.m. on weekdays and 9:00 a.m. to 5:00 p.m. on Saturdays, with no noise-generating construction on Sundays or holidays.

- Control noise from construction workers' radios to the point where they are not audible at existing residences that border the project site.

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers, which are in good condition and appropriate for the equipment.

- Utilize quiet models of air compressors and other stationary noise sources where technology exists.

- Locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses. Temporary noise barriers could reduce construction noise levels by 5 dBA.

- Prohibit unnecessary idling of internal combustion engines.

- Notify residents adjacent to the project site of the construction schedule, in writing.

- Designate a "noise disturbance coordinator," who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include in it the notice sent to neighbors regarding the construction schedule.

Implementation of the above measures would reduce construction noise levels emanating from the site, limit construction hours, and minimize disruption and annoyance. With the

implementation of these measures, and recognizing that noise generated by construction activities would occur over a temporary period lasting less than 18 months, the temporary increase in ambient noise levels would be less-than-significant.

Construction Vibration Assessment

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g. jackhammers, hoe rams) are used. Construction activities would include site preparation work, dewatering, excavation, retrofit reinforcement, and paving. The proposed project would not require pile driving, which can cause excessive vibration.

For structural damage, the California Department of Transportation recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for ancient buildings or buildings that are documented to be structurally weakened. All buildings in the project vicinity are assumed to be structurally sound, but these buildings may or may not have been designed to modern engineering standards. No ancient buildings or buildings that are documented to be structurally weakened are known to exist in the area. Therefore, ground-borne vibration levels exceeding 0.3 in/sec PPV would have the potential to result in a significant vibration impact.

Table 4 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.) may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. The single-family residences in the immediate project vicinity range from 50 to 205 feet; at these distances, vibration levels would be expected to be 0.1 in/sec PPV or less, below the 0.3 in/sec PPV significance threshold. This would be a less-than-significant impact and would not require mitigation.

TABLE 4 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Approximate L_v at 25 ft. (VdB)
Pile Driver (Impact)	upper range	1.158	112
	typical	0.644	104
Pile Driver (Sonic)	upper range	0.734	105
	typical	0.170	93
Clam shovel drop		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Transit Noise and Vibration Impact Assessment, United States Department of Transportation, Office of Planning and Environment, Federal Transit Administration, May 2006.

APPENDIX D. CULTURAL RESOURCES REPORTS

Under separate cover and available for review at the Town of Fairfax.