APPENDIX A

Natural Environment Study

Mountain View Road Bridge Replacement Project

Natural Environment Study

Mountain View Road Bridge

Marin County

Mountain View Road

Federal Project No. BRLO-5927(094)

June 2020

Prepared for:

COUNTY OF MARIN

Caltrans

CALIFORNIA DEPARTMENT OF TRANSPORTATION

Prepared By:

GANDA

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Mountain View Road Bridge Replacement Project

NATURAL ENVIRONMENT STUDY

Federal Project No. BRLO-5927(094)

June 2020

STATE OF CALIFORNIA
Department of Transportation
and County of Marin

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Summary

The County of Marin proposes the Mountain View Road Bridge Replacement Project (Project) to replace the existing bridge over San Geronimo Creek. The Project is located on Mountain View Road just off of Sir Francis Drake Boulevard in unincorporated Marin County in the community of Lagunitas-Forest Knolls.

The bridge replacement will include replacing the existing bridge structure with a new, wider and longer precast prestressed concrete slab, shifting the bridge alignment to the east, constructing new bridge abutments, raising the roadway and bridge profile to accommodate for 100-year flood elevation, and relocating overhead and underground utilities.

The Project Construction Area (PCA) is the area that will be directly impacted by construction, either through temporary or permanent impacts. The estimated area of the PCA is 0.61 acres. The Biological Study Area (BSA) is the area that the proposed Project's activities may directly or indirectly affect, and includes all areas where Project activities will occur and adjacent sensitive habitats. The BSA is approximately 2.31 acres and includes areas within the California Department of Transportation (Caltrans) and Marin County right-of-way. The Project will be implemented by Marin County, which has obtained grant authorization from Caltrans.

Preliminary biological technical studies were conducted for the Project, and include:

- Vegetation typing;
- A special-status plant survey;
- A tree inventory;
- An aquatic resource delineation; and,
- A wildlife habitat assessment.

Vegetation Types

Land cover types mapped within the BSA include California Bay Forest/California Buckeye Groves, Oregon Ash Forest/Red Alder Grove, Bigleaf Maple/Oregon Ash Forest, Landscaped/Ruderal, Road, and Creek. The preliminary aquatic resource delineation identified approximately 0.21 acres of other waters of the United States (U.S.) within the BSA. Table S-1 summarizes the estimated acreage of Project-related temporary and permanent impacts to vegetation communities and land-cover types that occur within the BSA. Existing pavement of Sir Francis Drake Boulevard and

Mountain View Road, and adjacent surface streets are all included in the BSA, but are not considered in the impact analysis as they do not provide suitable habitat for wildlife or plants**.**

Table S-1. Land Cover Types and Acreages within the BSA

Land Cover Type	Total Area within BSA (acres)	Temporary Impacts (Acres)	Permanent Impacts (Acres)	Total Impacts (Acres)
California Bay Forest/California Buckeye Groves	0.05	0.02	0.00	0.02
Oregon Ash Forest/Red Alder Grove	0.28	0.15	0.04	0.19
Bigleaf Maple/Oregon Ash Forest	0.36	0.13	0.06	0.19
Waters	0.21	0.12	0.04	0.16
Landscaped/Ruderal	0.47	0.03	0.01	0.04
Road	0.94	N/A	N/A	N/A
Total:	**2.31**	**0.45**	**0.15**	**0.60**

Tree Survey

A tree survey of the BSA occurred on May 27, 2015. All trees of 4 inches or larger diameter at breast height were included in the inventory and marked with individual, numeric-stamped, aluminum tree tags. A total of 75 trees were recorded within the BSA, with all but one considered native to California. A habitat survey conducted in 2019 verified no significant change in the BSA to affect the 2015 tree survey data.

Wetlands and Other Waters of the United States.

No wetlands are present within the BSA. Based on the aquatic delineation, there are a total 0.21 acres of other waters of the United States in the BSA. The Project will permanently impact approximately 0.04 acre and temporarily impact approximately 0.12 acre of other waters of the U.S.

Special-status Habitats and Species

Based on literature and database searches, prior botanical surveys, and familiarity with the region, a total of 86 plant species were initially evaluated, and 11 species were determined to have the potential to occur within the BSA. A special-status plant survey was conducted within the BSA in May and July 2015, and a habitat survey to verify the presence or lack of suitable habitat in the BSA for special-status plant species was

conducted in February 2019; no special-status plants were observed. Completion of this survey and past surveys indicates there is a low potential for rare plants to be in the BSA. However, additional seasonally timed special-status plant surveys will occur prior to Project construction. If protected species are discovered, appropriate agency coordination and protective measures will be established.

Wildlife studies were completed in the BSA in May 2015 and February 2019. Based on literature and database searches, past wildlife studies, and familiarity with the region, a total of 40 wildlife species were initially considered to have potential to occur within the BSA. Following the wildlife studies, 17 of these species were dropped from consideration based on a lack of suitable habitat. Four federal and/or state-listed species and nine other California species of special concern were considered to have at least a moderate potential to occur in the BSA.

Federal and State-listed Wildlife Species with Moderate/High Potential to Occur

- California red-legged frog (*Rana draytonii*), federally threatened, California Species of Special Concern
- Coho salmon (Central California evolutionarily significant unit) (*Oncorhynchus kisutch pop. 4*), federally endangered, state endangered
- Northern spotted owl (*Strix occidentalis caurina*), federally threatened, state threatened
- Steelhead trout (Central California Coast Distinct Population Segment) (*Oncorhynchus mykiss irideus pop. 8*), federally threatened

Special-status and Locally Rare Species with Moderate/High Potential to Occur

- California giant salamander (*Dicamptodon ensatus*), California Species of Special Concern
- Cooper's hawk (*Accipiter cooperii*), included on the California Department of Fish and Wildlife's (CDFW) Special Animals List
- Foothill yellow-legged frog (*Rana boylii*), California Species of Special Concern
- Oak titmouse (*Baeolophus inornatus*), included on the CDFW Special Animals List
- Pallid bat (*Antrozous pallidus*), California Species of Special Concern
- Rufous hummingbird (*Selasphorus rufus*), California Species of Special Concern

- San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), California Species of Special Concern
- Tomales roach (*Lavinia symmetricus* ssp. *2*), California Species of Special Concern
- Townsend's big-eared bat (*Corynorhinus townsendii*), California Species of Special Concern
- Western pond turtle (*Emys marmorata*), California Species of Special Concern
- Yellow warbler (*Setophaga petechia*), California Species of Special Concern
- Yuma myotis (*Myotis yumanensis*), included on the CDFW Special Animals List

Cumulative Effects

Several future projects are planned for the region surrounding the Project area. Such projects include the following:

San Geronimo Creek Coho Habitat Restoration Projects – The Marin County Resource Conservation District constructed two restoration projects to restore coho habitat in San Geronimo Creek in October 2019. One was located on the Greene-McGuinn property, about 1.3 miles east of the BSA, and the other was located on the Snyder-Stanger property, about 0.1 miles west of the BSA. Habitat restoration includes construction of in-stream and floodplain habitat improvements for coho salmon and other species in the project location. These projects are covered under a Mitigated Negative Declaration California Environmental Quality Act document that included AMMs to avoid impacts to jurisdictional wetlands or waters.

22 Resaca Avenue single-family residence – The construction of a single-family home on a 1 to 2-acre unit of land adjacent to Resaca Avenue is currently under permitting review with the County of Marin.

Sir Francis Drake Boulevard Roadway Rehabilitation – In 2017, Marin County resurfaced the Sir Francis Drake Boulevard roadway from the City of Fairfax limit to Samuel P. Taylor State Park (Shafter Bridge) to repair deterioration. The project was covered under an Environmental Impact Report that included AMMs to avoid impacts to jurisdictional wetlands or waters.

The effects of these projects will be assessed in their separate agency consultation and permitting processes. No unmitigated cumulative effects should result.

Avoidance and Minimization Efforts

General avoidance and minimization efforts will be implemented to reduce potential effects to special-status species within the BSA. These measures will include minimizing the area of impact, implementing work windows, conducting environmental education for construction personnel, conducting preconstruction surveys, delineation of the work area and all environmentally sensitive areas with fencing, presence of an on-site biological monitor during designated periods, and other construction site best management practices.

Compensatory Mitigation

As required by the National Environmental Policy Act, Federal Endangered Species Act, and the California Endangered Species Act, the County will implement reasonable and prudent measures to minimize and avoid take of special-status species.

Consultations, Permits, and Agreements

Permits expected for this Project include a Clean Water Act Section 404 Nationwide Permit from the U.S. Army Corps of Engineers; a Clean Water Act Section 401 Water Quality Certification from the Regional Water Quality Control Board; and, a California Department of Fish and Wildlife Section 1602 Lake and Streambed Alteration Agreement. Consultation with the U.S. Fish and Wildlife Service and National Marine Fisheries Service would also be required. Other regulations that apply include the federal Migratory Bird Treaty Act, the federal Magnuson-Stevens Fishery Conservation and Management Act, the California Endangered Species Act, and the California Department of Fish and Game Code.

Caltrans will coordinate with U.S. Fish and Wildlife Service, National Marine Fisheries Service, and U.S. Army Corps of Engineer representatives and the County will coordinate with CDFW and Regional Water Quality Control Board representatives to obtain appropriate permits for the Project.

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List of Abbreviated Terms

AASHTO	American Association of State Highway and Transportation Officials
amsl	above mean sea level
AMM	Avoidance and Minimization Measure
BA	Biological Assessment
BMP	Best Management Practice
BO	Biological Opinion
BSA	Biological Study Area
Caltrans	California Department of Transportation
CCC	Central California Coast
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CIDH	cast-in-drilled-hole
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRLF	California red-legged frog
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CWC	California Water Code
DBH	diameter at breast height
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	environmentally sensitive area
ESU	Evolutionarily Significant Unit
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FGC	[California] Fish and Game Code
FR	Federal Register
GANDA	Garcia and Associates
HAPC	habitat areas of particular concern
IPaC	Information for Planning and Consultation System
ISTEA	Intermodal Surface Transportation Efficiency Act

MALT	Marin Agricultural Land Trust
MAP-21	Moving Ahead for Progress in the 21st Century Act
MBTA	Migratory Bird Treaty Act
MCDC	Marin County Development Code
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
OWUS	other waters of the United States
PCA	Project Construction Area
PCE	primary constituent elements
PRC	Public Resources Code
quad	quadrangle
RHJV	Riparian Habitat Joint Venture
RSP	rock slope protection
RWQCB	Regional Water Quality Control Board
SHC	Streets and Highways Code
SWRCB	State Water Resource Control Board
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Chapter 1. Introduction

The County of Marin (County) proposes the Mountain View Road Bridge Replacement Project (Project) to replace the existing bridge over San Geronimo Creek. The project is located on Mountain View Road just off of Sir Francis Drake Boulevard in unincorporated Marin County in the community of Lagunitas-Forest Knolls (Appendix A: Figure 1). The Project will be implemented by the County, which has obtained grant authorization from the California Department of Transportation (Caltrans).

Mountain View Road is a rural, paved one-lane roadway that provides access to several residential properties on the south side of San Geronimo Creek. On the south side of San Geronimo Creek, Mountain View Road and Corona Avenue are part of a Private Road District.

Bridge replacement will include replacing the existing bridge structure with a new, wider and longer precast prestressed concrete slab, shifting the bridge alignment to the east, constructing new bridge abutments, raising the roadway and bridge profile to accommodate for 100-year flood elevation, and relocating overhead and underground utilities.

The Biological Study Area (BSA) is the area that may be directly or indirectly affected by the proposed project and includes all areas where Project activities will occur and adjacent sensitive habitats. The estimated BSA is approximately 2.31 acres (Appendix A: Figure 2). The Project Construction Area (PCA) is the area that will be directly impacted by construction, either through temporary or permanent impacts, and includes the existing roadway within the BSA and all areas where Project activities will occur, including all locations for access and staging of construction equipment. The estimated area of the PCA is 0.61 acre.

The purpose of this Natural Environment Study (NES) is to provide technical information to determine the extent to which the proposed Project may affect special-status species, wetlands and other waters of the U.S. (OWUS), protected natural plant communities, and anadromous fish passage. The NES presents technical information with which later decisions regarding Project impacts can be made.

1.1 Project Purpose and Need

Mountain View Road is currently a one-lane, 11-foot-wide, local rural road that serves two-way traffic. The existing bridge, Mountain View Bridge, was constructed in 1962 and is a three-span steel railroad car frame structure with timber deck runners. The bridge is approximately 51 feet long with an 11-foot clear width and does not meet American Association of State Highway and Transportation Officials (AASHTO) standards due to its narrow width. The bridge rails and approach guardrails consist of wooden railings which are also substandard. Overhead telephone and electrical lines and an underground water line are present in the Project area.

The existing bridge has been given a sufficiency rating of 59.0 and a status of functionally obsolete. The existing steel railroad cars which make up the bridge are rusting and have experienced minor structural section loss. Additionally, the grouted riprap on the north bank is undermined along its full length.

1.2 Project Description

The proposed Project will replace the existing bridge over San Geronimo Creek with a new structure accommodating one 12-foot-wide lane with 2-foot-wide shoulders and bridge railings, resulting in a bridge width of approximately 20 feet (Appendix A: Figure 2). The new structure will be a 70-foot-long, single-span, precast, prestressed concrete slab unit bridge. The alignment will shift to the east by approximately 7 feet. The roadway profile of the bridge will be raised approximately 4 feet to clear the 100-year flood elevation.

The Project improvements will remain within Caltrans and the County's right-of-way, and permanent right-of-way acquisitions are not anticipated. Temporary construction easements will be required from several parcels in order to reconstruct driveways, provide access to the creek, and provide adequate storage and staging areas. A review of the Marin Agricultural Land Trust (MALT) map shows that there are no MALT conservation easements on the properties directly adjacent to the Project site.

Removal of several trees and other vegetation along the creek banks will be necessary for the Project. Temporary work within San Geronimo Creek is anticipated to include removal of the existing bridge, removal of supports, removal of grouted riprap, installation of scour countermeasures, and construction of retaining walls along the top

of the south creek bank. A temporary creek diversion is anticipated in order to complete activities within the waterway.

1.1.1. Bridge Demolition

Prior to bridge construction, the existing bridge will be demolished, including the existing wingwalls, abutments, piers, and foundations. Bridge demolition will begin with removal of the existing bridge superstructure. After removal of the superstructure, the abutments and wingwalls in the creek bank will be removed. Fill will be removed from an area of approximately 360 square feet.

A creek diversion will prevent any demolition work from occurring within the flowing creek channel. Demolition equipment expected to be used includes a backhoe and dump trucks.

1.1.2. Bridge Construction

The new bridge will consist of precast abutments and wingwalls, supported on cast-in-drilled-hole (CIDH) piles, precast voided slabs, and cast-in-place concrete deck and barrier railing.

New abutments will be constructed behind the existing abutments; this work will occur outside of the creek channel. Four 24-inch diameter CIDH piles will be used to support each abutment. The CIDH piles will be installed prior to bridge demolition and will require temporary closures of the existing roadway. In order to install the CIDH piles, shafts will be drilled, a drill rig will place reinforcement cages for the piles, then each bored hole will be filled with concrete. Once the existing piles are in place, the roadway will be reopened to traffic until the next stage of construction.

After bridge demolition, the area around the proposed abutments and wingwalls will be excavated. A crane will then place the precast abutments and wingwalls. Concrete pump trucks will be used to provide closure pours and fill voids. The abutment will be post-tensioned with the use of jacks. A crane will then place the precast voided slab superstructure units. The crane is expected to be positioned on the north approach and a portion of San Francis Drake Boulevard will be closed for all precast element lifts. After completing placement of the precast voided slabs, a cast-in-place deck will be placed along with concrete barrier railings. Each abutment will accommodate a drainage outlet. The outlet on the northern abutment will be on the wingwall, and the

outlet on the southern abutment will be on the downstream side. Each drainage outlet will extend through rock slope protection (RSP).

During construction, k-rail and crash cushions will be placed on Sir Francis Drake Boulevard as a protection measure. As is standard with all roadway projects, the contractor will be required to install temporary Best Management Practices (BMPs) to control any runoff or erosion from the Project site into any nearby waterways (i.e., San Geronimo Creek). These temporary BMPs will be installed prior to any construction operations and will be in place for the duration of the contract. The removal of these BMPs will be the final operation, along with the Project site cleanup.

1.1.3. Roadway Repavement

To account for the bridge's new 4-foot height increase, the roadway profiles of the approaches on Sir Francis Drake Boulevard, Mountain View Road, and Corona Avenue will be raised and repaved. Construction of the roadway approaches will involve the removal of existing pavement and the placement of fill material, aggregate base, and hot mix asphalt pavement.

On the north, the roadway approach work will start at the Mountain View Road and Sir Francis Drake Boulevard intersection, raising the center of the intersection by 2 feet. The roadway approach work will extend 440 feet along Sir Francis Drake Boulevard (238 feet to the west and 202 feet to the east), gradually conforming to the existing roadway. The roadway cross-section along Sir Francis Drake Boulevard will consist of 12-foot-wide lanes and varying shoulder widths to match existing conditions (Appendix A: Figure 2).

The southern roadway approach work will start at the Mountain View Road and Corona Avenue east intersection, raising the center of the intersection by 2 feet. The roadway approach work will extend 60 feet down Corona Avenue east, 25 feet down Corona Avenue south, 95 feet down Mountain View Road, and 115 feet down a private driveway, gradually conforming to the existing roadways. The roadway cross-section will consist of a single lane varying in width from 9 to 12 feet, consistent with the existing roadway widths of Mountain View Road and Corona Avenue.

1.1.4. Retaining Walls

The two retaining walls in this Project will be soldier pile walls with precast concrete lagging supported by steel W beams in drilled holes. Each retaining wall will begin at an abutment wingwall and decrease in elevation with each pile.

The left retaining wall on Mountain View Road will consist of 16 piles placed every 6 feet for a total length of 94 feet. The retaining wall will start at the abutment wingwall on the southwest end of the bridge and decrease about 7 feet in elevation at its end.

The right retaining wall on Corona Avenue will consist of eight piles placed every 6 feet for a total length of 44 feet. The retaining wall will start at the abutment wingwall on the southeast end of the bridge and decrease about 4 feet in elevation at its end. This retaining wall will also feature a culvert on the eastern side.

The retaining walls are anticipated to be constructed concurrently with the proposed bridge. Piles adjacent to the abutment wingwalls will be installed prior to wingwall placement. The rest of the piles and timber lagging may be installed prior to, during, or after the existing bridge demolition and new bridge construction. The retaining walls will require temporary closures of Mountain View Road and will need to be constructed in the same closure window required to demolish the existing bridge and construct the replacement bridge.

The retaining walls will be constructed by drilling holes with a drill rig and then using the rig to place the steel W piles in the drilled holes. Concrete pump trucks will be used to fill the holes. Once the piles are in place, excavation of the wall face will be conducted with a backhoe and timber lagging placed by hand.

1.1.5. Scour Countermeasures

Scour countermeasures consisting of vegetated RSP are anticipated to be placed in front of both abutments and in front of the retaining walls within the mean high water mark of the creek channel. This may be done using a backhoe or other smaller construction equipment.

1.1.6. Storm Drain Reconstruction

An existing storm drain culvert running under Corona Avenue east will be replaced. Two storm drain pipe outlets into the creek will also be replaced and one new storm drain pipe outlet into the creek will be installed concurrent with the bridge construction.

A 36-inch pipe will be placed under Corona Avenue east and two 18-inch storm drain pipes will be placed under Sir Francis Drake on either side of Mountain View Road.

1.1.7. Utility Removal and Relocation

Existing overhead electric and communication lines, two utility poles to the northeast and southeast of the bridge, and a fire hydrant located off the southeast corner of the bridge will be relocated, as close as possible to the original location, as part of this Project. Relocation of these utilities will be conducted by utility providers. In addition, an existing waterline that is supported on the existing bridge will be removed and relocated onto the proposed bridge.

1.1.8. Temorary Creek Diversion

Project construction is expected to begin in Spring 2021 and is anticipated to have a duration of six months. Construction activities within the banks of San Geronimo Creek will be performed between June 15 and October 15, which will correspond to when there is little or no precipitation and when stream flow is lowest. In order to remove the existing piers and abutments and to place RSP, work within the San Geronimo Creek channel, including use of an excavator and backhoe, will be necessary. If water is present in the channel, a temporary creek diversion is proposed to dewater the work area within the creek bed during the construction window from June 15 to October 15.

Temporary impacts to construct and maintain the temporary creek diversion will extend approximately 100 feet upstream and 100 feet downstream from the drip line of the existing Mountain View Bridge (see Appendix A: Figure 11). All construction equipment used for the construction of the creek diversion will use the construction access roads described in Section 1.2.11.

The temporary creek diversion will consist of cofferdams upstream and downstream of the work area in order to create a dewatered work area and to control sediment dispersal within the creek. Cofferdams, to be constructed of plastic-wrapped gravel bags, sheet piles, or steel plate, will be placed in the creek throughout the portion of the Project that requires work within the creek channel.

The temporary dams will be approximately 6 feet wide at the base and 4 feet tall. Prior to placement of the dams, sharp objects, boulders, and cobbles will be removed from the dam area to create a smooth streambed and prevent channels by which water can pass beneath the dams after they are built; these objects will be removed by hand or, if

necessary, by a grapple located on either side of the creek. The water will flow downstream using a gravity fed or pumped bypass line. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer base flow. The contractor is required to maintain free flowing water bypass at all times during the Project, including nighttime and weekends. Diverted flows will be returned to the stream channel immediately downstream of the work area. The outlet of all water diversions will be positioned such that the discharge of water maintains pre-Project hydraulic conditions and does not result in bank erosion or channel scour.

An additional area of 12 feet upstream from the upstream dam base and 12 feet downstream from the downstream dam base is proposed for access to construct the dams and may have temporary impacts by construction personnel and equipment staging.

A temporary roadway/ramp will be constructed in the dry creek bed for the creek diversion construction window. The temporary roadway/ramp will be constructed of 0.5 to 1 ton of native creek material and virgin base that will cover 15 cubic yards. Heavy equipment, trucks, and other construction equipment will use this temporary roadway/ramp while working in the creek area.

Following the implementation of the creek diversion, any ponded water located in between the upstream berm and the downstream berm will be pumped out with screened intakes with mesh not larger than 2.4 millimeters (3/32 inches) to create a dry working environment.

Pumped water will be discharged to a filtration/settling system (i.e. filter fabric, turbidity curtain or settling basin) downstream of work area to reduce turbidity or will be discharged to vegetated upland areas for infiltration, where the water may be absorbed by the ground and not flow back into the creek. All sediment collected from dewatering the construction area will be disposed of off-site to an approved location.

Pumps shall be placed in flat areas away from the stream channel. To prevent movement caused by vibration, the pumps will be securely tied to a tree or stake. Pumps will be refueled in an area that is well away from stream channel, and fuel absorbent mats will be placed under pumps while refueling. Spill control kits will be available at the Project site at all times, and construction personnel will be trained in the proper spill control procedures. In no case will any sediment laden or contaminated water be discharged directly to any waterway.

Impacted waters located in the work area would either be treated per the requirements of a Storm Water Pollution Prevention Plan (SWPPP) prepared for the Project or disposed of per Regional Water Quality Control Board (RWQCB) requirements. Activities within the channel would commence only after appropriate dewatering and storm water quality BMPs are in place. BMPs would consist of all applicable federal, state, and local erosion and sediment control policies including those outlined under the County's Stormwater Pollution Prevention Program. Water intake structures will be installed, operated, and maintained in accordance with current National Marine Fisheries Service (NMFS), United States Fish and Wildlife Service (USFWS), and California Department of Fish and Wildlife (CDFW) criteria or as developed in cooperation with NMFS, USFWS, and CDFW to accommodate site-specific conditions.

The temporary creek diversion and all equipment in the creek will be removed from the channel by October 15 or as soon as Project construction in the creek is complete. Water will be slowly released back into the work area as to prevent erosion and increased turbidity. The creek diversion structure will be removed in a manner that will allow flow to resume with the least disturbance to the substrate. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than 1 inch per hour. This will minimize the risk of beaching and stranding of fish as the area upstream becomes dewatered.

1.1.9. Fish Rescue and Relocation

Fish rescue and relocation will be detailed in a Fish Handling Plan, to be developed in cooperation with NMFS. Fish screens are to be installed prior to fish relocation or dewatering. Construction work shall be coordinated with any work performed by biologists performing fish relocation activities, to avoid conflicts. Prior to installation of water diversion structures and prior to Project activities, an agency-approved biologist will perform surveys for special-status species in the BSA, place nets upstream and downstream to collect species, and relocate captured species to the nearest predetermined suitable habitat. During holding and transportation, special-status species will be held in stream water collected from the Project site. Prior to fully dewatering the Project area, remaining species in the work area will be rescued. Dewatering efforts will be monitored by the biologist at all times. The biologist will relocate any species that will be stranded. Fish screens made up of 1/8" hardware cloth shall be placed above diversion point and below outlet of diversion.

1.1.10. Revegetation

Project construction may result in impacts to riparian vegetation along San Geronimo Creek in the construction easement areas and immediately adjacent to Mountain View Bridge. In addition, six trees will be removed for construction access.

In areas of temporary construction impact, appropriate replacement of native vegetation will be planted in areas where they would not affect roadway safety. The old alignment will be remediated and replanted with appropriate native vegetation and trees. Hydroseeding of native grass seed mix will occur where appropriate. Vegetated RSP will be placed in front of abutments, wingwalls, and retaining walls. Any trees removed will be replaced in appropriate mitigation ratios according to agency and permitting determinations. Specifications regarding vegetation and tree replacement will be provided during the design phase of the Project (estimated to be completed in 2020).

1.1.11. Construction Staging

Sir Francis Drake Boulevard is expected to remain open to traffic throughout construction. During bridge construction, two lanes of traffic will be provided along Sir Francis Drake Boulevard. A temporary shift in the alignment along Sir Francis Drake Boulevard is expected in order to provide contractor staging areas along the south shoulder of Sir Francis Drake Boulevard near the Project site. The shift is anticipated to be approximately 6 feet to the north extending approximately 300 to 400 feet in both directions, with temporary k-railing running along the south shoulder to separate the staging area from traffic. Repavement on Sir Francis Drake Boulevard is expected to take a maximum of two weeks, and one-way traffic control may be temporarily needed.

There are two access points to the residential community on the south side of San Geronimo Creek in Lagunitas; one at Mountain View Road and one just downstream along Lagunitas Road. Road closure of Mountain View Road across the creek is expected in order to expedite construction of the replacement bridge and roadway approach work. Access on the south side of the creek along Mountain View Road and Corona Avenue will be maintained throughout construction. However, there may be limited timeframes where access to residential properties will be restricted to facilitate raising the profile and constructing driveway conforms.

Mountain View Road across San Geronimo Creek will be closed to traffic during the existing bridge removal, new bridge construction, and retaining wall construction. It is anticipated that the closure will last approximately two months. Traffic will be detoured during the closure, and Mountain View Road will be accessed using Lagunitas Road, located approximately 1,000 feet west of Mountain View Road.

The locations described above will serve as the routes to access San Geronimo Creek and the bridge for Project construction. These access routes shown as the Temporary Construction Easement in Appendix A, Figure 11.

1.3 Avoidance and Minimization Measures

To avoid and minimize impacts to special-status species and their habitats within the Project area, the County would implement the following general avoidance and minimization measures (AMMs):

1. **Permits.** Marin County would include a copy of all relevant regulatory permits within the construction bid package of the proposed Project. The Resident Engineer or their designee would be responsible for implementing the Terms and Conditions of those regulatory permits.

2. **Biological Monitor Approval.** USFWS/CDFW would review and approve the qualifications of the biological monitor(s) prior to initiating construction activities for the proposed Project. The approved monitor would be on-site for all designated activities as required by the agencies during consultation.

3. **Limited Project Duration, Disturbance, and Footprint.** To minimize impacts to the environment, construction-related disturbances and the Project footprint would both be limited to the minimum amount needed to complete the Project. The duration and amount of construction-related disturbance in the creek channel would also be limited to the extent practicable.

4. **Work Period.** In accordance with the NMFS and CDFW work window for salmonids, work in the San Geronimo Creek channel would be restricted to the period from June 15 to October 15, when stream flow will be lowest.

5. **Work Window for Northern Spotted Owl.** The County would commission two surveys for nesting northern spotted owls during the months of April and May preceding the commencement of construction. At a minimum, the survey

area would include all suitable nesting habitats within 0.25 mile of the Project site. If, following the first or second survey, it can be conclusively determined that there are nesting northern spotted owls, construction activities that are within 0.25 mile of an identified active nest would not begin prior to August 1 unless the young have fledged, at which time construction or staging may begin no earlier than July 10. Regardless of nesting locations, construction would conclude no later than January 31 (prior to the beginning of the mating and nesting season). If a northern spotted owl is identified during the preconstruction surveys and/or during construction, USFWS will be notified within 24 hours.

6. **Limited Construction During and After Rain Events.** To the maximum extent practicable, no construction activities would occur during rain events or within 24 hours following a rain event. Prior to construction activities resuming, an agency-approved biologist will inspect the BSA and all equipment and materials for the presence of special-status species. The animals would be allowed to move away from the Project site of their own volition or be relocated by the agency-approved biologist according to protocol established by the agency.

7. **Preconstruction Surveys.** Prior to any ground disturbance, an agency-approved biologist would conduct preconstruction surveys for special-status species and habitats in and adjacent to the proposed Project area. These surveys would consist of walking surveys of the Project limits and, if possible, accessible adjacent areas within at least 50 feet of the Project limits. The biologist(s) would investigate all potential cover sites. This includes thorough investigation of mammal burrows, rocky outcrops, appropriately sized soil cracks, tree cavities, and debris. Native vertebrates found in the cover sites within the Project limits would be documented and relocated to an adequate cover site in the vicinity. The entrances and other refuge features within the Project limits would be collapsed or removed following investigation. Regulatory agencies would be notified within 24 hours if any unanticipated listed species are identified during these surveys.

8. **Work Window for Nesting Birds.** To the extent practicable, clearing and grubbing activities and any tree removal would be conducted during the non-nesting season, from September 1 to February 14.

9. **Nesting Bird Surveys.** A nesting bird survey would be performed by an approved biologist no more than 72 hours prior to the start of construction activities occurring during the breeding season (February 15 to August 31).

10. **Non-disturbance Buffer for Nesting Birds.** If work is to occur within 100 feet of active raptor nests or 50 feet of active passerine nests, a non-disturbance buffer would be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the species' sensitivity to disturbance, and the intensity/type of potential work activities.

11. **Roosting Bat Surveys.** No more than two weeks prior to tree removal, a qualified biologist would conduct a pre-construction survey for crevice and cavity roosting habitat within the bridge and in trees within the BSA that are 12 inches or greater in diameter at breast height (DBH). Surveys for maternity colonies should be conducted during the summer of the year before the Project is scheduled so that any such roosts can be removed/replaced or exclusionary measures can be put in place prior to the onset of the non-volant period.

12. **California Red-legged Frog Preconstruction Survey.** No more than 24 hours prior to the date of initial ground disturbance, a preconstruction survey for the California red-legged frog would be conducted by an agency-approved biologist at the Project site. The survey would consist of walking the project limits and within the Project site to ascertain the possible presence of the species. The agency-approved biologist would investigate all potential areas that could be used by the California red-legged frog for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as California ground squirrels or gophers. If any adults, subadults, juveniles, tadpoles, or eggs are found, the agency-approved biologist would contact USFWS to determine if moving any of the individuals is appropriate. In making this determination, USFWS would consider if an appropriate relocation site exists. If USFWS approves moving animals, the agency-approved biologist would move the animals from the work site before ground disturbance is initiated. Only agency-approved biologists would capture, handle, and monitor the California red-legged frog.

13. **Biological Monitoring.** The agency-approved biologist(s) would be on-site during initial ground-disturbing and in-water activities, and thereafter as needed

to fulfill the role of the approved biologist as specified in the Project permits. The biologist(s) would keep copies of applicable permits in their possession when on-site. Through the Resident Engineer or their designee, the agency-approved biologist(s) would be given the authority to communicate either verbally, by telephone, email, or hardcopy with all Project personnel to ensure that the risk of take of listed species is minimized and that all permit requirements are fully implemented. Through the Resident Engineer or their designee, the agency-approved biologist(s) would have the authority to stop Project activities to minimize take of listed species or if he/she determines that any permit requirements are not being fully implemented. If the agency-approved biologist(s) exercises this authority, the agencies would be notified by telephone and email within 48 hours.

During in-water activities, the approved biologist would continuously monitor all activities (e.g., installation and removal of cofferdams and pipes) for the purpose of avoiding and minimizing any undue impacts to coho salmon, steelhead, and other special-status aquatic species (fish and herpetofauna), coho salmon critical habitat, steelhead critical habitat, habitat areas of particular concern (HAPC), and Essential Fish Habitat (EFH) for coho salmon; and to ensure that the diversion and dewatering devices are functioning properly. An approved aquatic biologist would also be present for the purpose of removing and relocating any listed species that were not detected during the fish rescue or could not be removed and relocated prior to construction. The approved aquatic biologist would be present at the work site until all listed species have been removed and relocated.

The approved biologist would maintain detailed records of the species, numbers, life stages, and size classes of special-status species observed, collected, relocated, injured, or killed; as well as recording the date and time of each activity or observation and would provide this information to NMFS and CDFW, as necessary. The approved biologist would also maintain detailed records of any impacts to special-status habitats (in particular to primary constituent elements [PCEs] of coho salmon and steelhead critical habitat and to HAPCs of coho salmon EFH) and provide this information to NMFS.

14. **Worker Environmental Awareness Training.** Prior to working on the Project, all construction personnel would attend a mandatory environmental education program delivered by an approved biologist. At a minimum the

training would include a description of listed species, migratory birds, and their habitats. The training would also discuss the potential occurrence of these species within the BSA; an explanation of the status of these species and their protection under the Endangered Species Act and other laws; the measures to be implemented to conserve listed species and their habitats as they relate to the work site; and boundaries within which construction may occur. Documentation of the training, including sign-in sheets, would be kept on file and would be available on request.

15. **Fish Handling Plan.** A fish handling and relocation plan would be developed by the approved aquatic biologist in coordination with NMFS and/or CDFW. Individual organisms would be relocated the shortest distance possible to an adjacent upstream area with sufficient aquatic habitat. Within occupied habitat, capture, handling, exclusion, and relocation activities would be completed no earlier than 48 hours before construction begins. If electrofishing is conducted, it must be performed by an approved biologist following NMFS guidelines (NMFS 2000).

    During fish relocation, all organisms would be kept in water to the maximum extent possible and captured coho salmon and steelhead would be kept in cool, shaded, well-aerated water and protected from disturbance and overcrowding until they are released. To avoid predation, separate containers would be used: one for young-of-the-year coho and steelhead, and one for second- or third-year coho and steelhead. Captured fish would be relocated to suitable upstream rearing habitat that is as close to the dewatered area as possible while meeting the survival needs (adequate water quality/quantity, cover, and forage) of both the relocated individuals and the fish already inhabiting the relocation site.

    The fish handling plan would include methods for detecting and relocating lamprey larva (ammocoetes) following the recommendations in *Attachment A: Electrofishing Recommendations for Sampling Larval Pacific Lampreys in Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (Entosphenus tridentatus)* (USFWS 2010c).

16. **Water Diversion and Dewatering.** If flowing water is present in the channel, the flow would be diverted around the work area by creating a temporary diversion to isolate a dry active construction work area following *BMP NS-5:*

Clear Water Diversion in the Caltrans Construction Site BMP Manual (Caltrans 2017). The temporary diversion would be installed as close as possible to the construction area to minimize impacts to the flow of the stream and would be constructed to ensure a tight seal with the creek bed to allow for a dry work area and minimize downstream turbidity. As necessary, water behind the dam would be pumped out and piped to a downstream location. Any water intake structure would be installed, operated, and maintained in accordance with current NMFS, USFWS, and CDFW criteria, or as developed in cooperation with NMFS, USFWS, and CDFW to accommodate site-specific conditions. Water would be released or pumped downstream at an appropriate rate to maintain downstream flows and the outlet of all diversions would be positioned such that the discharge of water does not result in bank erosion or channel scour and maintains pre-Project hydraulic conditions. The length of the pipe would be the minimum necessary to safely convey the flow through the construction site and would be placed on the streambed at natural grade. Diverted flows would be returned to the stream channel immediately downstream of the work area. Immediately upon completion of in-channel work, temporary fills, diversion cofferdams, and other in-channel structures would be removed in a manner that minimizes disturbance to downstream flows and water quality. Creek diversion would be limited to the minimum amount of time necessary to support construction activities.

17. **Coho Salmon and Steelhead Critical Habitat and Essential Fish Habitat (EFH) Protection.** Downed trees, stumps, boulders, and other refuges would remain undisturbed as much as possible. Thermal refugia (pools) and suitable spawning sites would remain undisturbed as much as possible. Disturbances to coho salmon and steelhead critical habitat and EFH would be documented by the approved biologist and provided to NMFS as necessary.

18. **Tree Protection.** Tree preservation measures including root pruning, cabling, trunk armoring, and monitoring by a licensed arborist would be incorporated into the Project design and implemented during Project planning and construction to minimize tree removal and loss in the Project area.

19. **Creek Bed and Bank Protection.** The creek bed and banks would be protected to prevent permanent impacts from temporary construction access and Project construction. Construction equipment designed to apply low ground pressure would be used in the channel to minimize compaction of the creek bed. Native

substrates removed during excavations and earthwork would be stockpiled and returned to the creek bed and banks following Project construction as part of the site restoration effort.

20. **Aquatic and Riparian Vegetation Protection.** Disturbance and removal of riparian, emergent, and aquatic vegetation would be minimized. If riparian vegetation must be cut back, it would be to the minimum height necessary (no lower than ground level) in order to promote rapid re-growth.
21. **Fish and Wildlife Refugia Protection.** Downed trees, stumps, boulders, and other basking sites and refuges within aquatic habitat would remain undisturbed to the extent possible.
22. **Debris Containment.** Debris containment would be provided to keep bridge debris from falling into San Geronimo Creek during demolition and construction activities.
23. **Wildlife Exclusion Fencing.** High visibility wildlife exclusion fencing at least 4 feet in height would be installed around suitable habitat for listed species within the outer footprint of the Project to prevent wildlife from accessing work areas. The fencing would be removed only when all construction equipment is removed from the site. No Project activities would occur outside the delineated Project area. The wildlife exclusion fencing would be monitored periodically and all areas would be checked following rain events. Construction activities occurring outside of suitable habitat for special-status species would not require wildlife exclusion fencing.
24. **Listed Species On-site.** The Resident Engineer would immediately contact the agency-approved Project biologist(s) in the event that coho salmon, steelhead, California red-legged frog, or other listed species are observed within a construction zone. The Resident Engineer would suspend construction activities within a 50-foot radius of the animal until the animal leaves the site voluntarily or an agency-approved protocol for removal has been established.
25. **Prevention of Wildlife Entrapment.** To prevent inadvertent entrapment of wildlife species during construction, excavated holes or trenches more than 1 foot deep with walls steeper than 30 degrees would be covered at the close of each working day by plywood or similar materials. Alternatively, an additional 4-foot-high vertical barrier, independent of exclusionary fences, would be used to further prevent the inadvertent entrapment of wildlife species. If it is not

feasible to cover an excavation or provide an additional 4-foot-high vertical barrier, independent of exclusionary fences, one or more escape ramps constructed of earth fill or wooden planks would be installed. Before such holes or trenches are filled, they would be thoroughly inspected for trapped animals. If at any time a trapped listed animal were discovered, the on-site biologist would immediately place escape ramps or other appropriate structures to allow the animal to escape or the USFWS/CDFW would be contacted by telephone for guidance. The USFWS/CDFW would be notified of the incident by telephone and electronic mail within 48 hours.

26. **Construction Activities around Bat Roosts.** Any area under a confirmed day or night bat roost that is within visual sight of bats would be designated as an environmentally sensitive area (ESA). To minimize impacts to day roosts during the non-volant period when young are present but cannot fly (May 1 to July 31), work would not occur directly under or adjacent to the roost. To minimize impacts to night roosts, construction activities would not occur immediately around a roost site between 10:00 p.m. and sunrise, especially during the period of highest night-roost use from spring to fall.

    Clearing of vegetation and grubbing around roosts would be minimized wherever possible. Combustion equipment (e.g., pumps, generators, vehicles) would not be used immediately under the roost. The presence of personnel under roost sites would be minimized, particularly during the evening exodus. Lights would not be placed in a location where a roost site would be illuminated.

27. **Material Storage.** California red-legged frogs are attracted to cavity-like structures, such as pipes, and may seek refuge under construction equipment or debris. They may become trapped or injured if such materials are moved. All construction pipes, culverts, or similar structures, construction equipment or construction debris left overnight within the work area would be inspected by the agency-approved biological monitor prior to being moved.

28. **RSP Installation.** RSP installation would follow fish passage guidelines consistent with the *California Salmonid Stream Habitat Restoration Manual* (CDFW 2010) and the *NMFS Anadromous Salmonid Passage Facility Design* (NMFS 2011).

29. **Tree Survey.** In accordance with Project permitting, trees within the Project

area would be surveyed to account for construction impacts and appropriate mitigation. The County would provide tree replacement on-site to the maximum extent possible and an off-site planting strategy would be developed in coordination with CDFW and RWQCB during the permitting process to address the balance of tree mitigation needs. All riparian trees would be mitigated at a 3:1 ratio, and all upland trees at a 1:1 ratio.

30. **Restoration and Revegetation.** Modified or disturbed portions of the stream channel, banks, and riparian areas would be restored as nearly as possible to natural and stable contours (elevations, profile, and gradient). Native substrates removed during excavations and earthwork would be stockpiled and returned to the creek bed and banks. An assemblage of native grass seed mix and shrubs would be applied to areas disturbed by construction, creek access, and contouring, as well as to areas where native soils overlay the buried RSP. Riparian trees would be planted in areas on-site and in-kind to those requiring removal for construction access. Riparian plants would also be planted along the banks in the areas of bank stabilization, RSP placement, and any disturbed areas. Live willow cuttings would be used at the appropriate lower bank elevations (just above bank toe). Invasive, exotic plants would be controlled within the Project site to the maximum extent practicable, pursuant to Executive Order 13112.

31. **Management of Japanese Knotweed.** Japanese knotweed is an invasive species prevalent within the region. If Japanese knotweed is identified in the Project area, excavation around the plant will be avoided when possible. When excavation around the plant cannot be avoided due to construction activities, the plant will be excavated 10 feet below the surface and disposed of off-site.

32. **Removal of Exotic Wildlife Species.** The agency-approved biologist would remove any aquatic exotic wildlife species, such as bullfrogs and crayfish from the Project site, to the maximum extent possible.

33. **Pollutant Minimization.** To avoid and minimize sediment loading and point source pollutants, bio-swales and bio-filtration would be installed adjacent to roadways at the Project site.

34. **Water Quality Inspection.** Water quality inspector(s) would inspect the site after a rain event to ensure that the stormwater BMPs are adequate.

35. **Vehicle Use.** Project employees would be required to comply with guidance governing vehicle use, speed limits on unpaved roads, fire prevention, and other hazards.

36. **Night Work.** To the extent practicable, nighttime construction would be minimized.

37. **Night Lighting.** Artificial lighting of the Project site during nighttime hours would be minimized and directed away from non-paved surfaces to the maximum extent practicable.

38. **Trash Control.** All food-related trash items such as wrappers, cans, bottles, and food scraps would be disposed of in closed containers and removed at least once a day from the work area.

39. **Firearms.** No firearms would be allowed in the Project area except for those carried by authorized security personnel, or local, State, or federal law enforcement officials.

40. **Pets.** To prevent harassment, injury or mortality of sensitive species, no pets would be permitted on the Project site.

41. **Caltrans Standard BMPs.** The potential for adverse effects to water quality would be avoided by implementing temporary and permanent BMPs outlined in Section 7-1.01G of the Caltrans Standard Specifications. Caltrans erosion control BMPs would be used to minimize any wind- or water-related erosion. The State Water Resources Control Board (SWRCB) has issued a National Pollution Discharge Elimination System (NPDES) Statewide Storm Water Permit to Caltrans to regulate storm water and non-storm water discharges from Caltrans facilities. A SWPPP would be developed for the Project, as one is required for all projects that have at least 1.0 acre of soil disturbance. The SWPPP complies with the Caltrans Storm Water Management Plan (SWMP). The SWMP includes guidance for Design staff to include provisions in construction contracts to include measures to protect sensitive areas and to prevent and minimize storm water and non-storm water discharges.

The SWPPP will reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive, includes many other protective measures and guidance to prevent and minimize pollutant discharges, and can be found at the following website:

http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm

Protective measures would be included in the contract, including, at a minimum:

a. No discharge of pollutants from vehicle and equipment cleaning are allowed into the storm drain or water courses.

b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from water courses.

c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed of and not allowed into water courses.

d. Dust control will be implemented, including use of water trucks and tackifiers to control dust in excavation and fill areas, rocking temporary access road entrances and exits, and covering temporary stockpiles when weather conditions require.

e. Coir rolls will be installed along or at the base of slopes during construction to capture sediment and temporary organic hydro-mulching will be applied to all unfinished disturbed and graded areas.

f. Work areas where temporary disturbance has removed the pre-existing vegetation will be re-seeded with a native seed mix.

g. Graded areas will be protected from erosion using a combination of silt fences, fiber rolls along toe of slopes or along edges of designated staging areas, and erosion-control netting (such as jute or coir) as appropriate.

h. A Revegetation Plan will be prepared for restoration of temporary work areas. Pavement and base will be removed; topography blended with the surrounding area; and topsoil will be salvaged from the new alignment area to be placed over the restored area, which will then be revegetated with native grassland species.

42. **Prohibition of Monofilament Erosion Control.** Plastic mono-filament netting (erosion control matting) or similar material would not be used. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds.

43. **Concrete Waste and Stockpiles.** All grindings and asphaltic-concrete waste would be stored within previously disturbed areas absent of habitat and at a minimum of 150 feet from any aquatic habitat, culvert, or drainage feature.

44. **Care of Injured or Dead Species.** Listed species found injured would be cared for by a licensed veterinarian or a wildlife rehabilitation facility. After hours, interim care may be provided by another experienced person, including the on-site biologist, until the animal can be delivered to a facility. Dead individuals of any listed species would be preserved by freezing and held in a secure location. The USFWS and/or CDFW would be notified of the discovery of death or injury to a listed species occurring as a result of Project-related activities or if observed at the Project site.

1.4 Mitigation

As required by the National Environmental Policy Act (NEPA), Federal Endangered Species Act (FESA), and California Endangered Species Act (CESA), the County would implement reasonable and prudent measures to minimize and avoid take of special-status species.

Chapter 2. Study Methods

2.1 Regulatory Requirements

Project implementation was assessed for the potential to affect natural resources within the jurisdiction of the following federal and state agencies:

- U.S. Fish and Wildlife Service (USFWS) (Sacramento Office)
- U.S. Army Corps of Engineers (USACE) (San Francisco Office)
- California Department of Fish and Wildlife (CDFW) (Bay-Delta Region Office)
- National Marine Fisheries Service (NMFS)
- San Francisco Bay Regional Water Quality Control Boards (RWQCB)

2.1.1. Federal Laws and Executive Orders

2.1.1.1. NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act of 1969 (NEPA) (42 United States Code [USC] § 4321) requires the consideration of environmental impacts of proposed federal agency actions, including the issuance of permits or approval of funding.

2.1.1.2. FEDERAL ENDANGERED SPECIES ACT

The Federal Endangered Species Act (FESA) (USC § 1531) and its implementing regulations prohibit the take of any fish or wildlife species that is federally listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the FESA. The FESA defines "take" as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

Federal regulation 50 Code of Federal Regulations (CFR) 17.3 defines the term "harass" as an intentional or negligent act that creates the likelihood of injuring wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, or sheltering. Furthermore, 50 CFR 17.3 defines "harm" as an act that either kills or injures a listed species. By definition, "harm" includes habitat modification or degradation that actually kills or injures a listed species by significantly impairing essential behavior patterns such as breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 217.12).

Caltrans initiates consultation with USFWS or NMFS through Section 7 of the FESA when a project has the potential to affect a federally listed species and/or adversely modify designated critical habitat. A formal Section 7 consultation with the USFWS or

NMFS is initiated with the submission of a Biological Assessment (BA). Following the formal consultation process, the USFWS or NMFS will issue a Biological Opinion (BO) on whether the proposed activity will jeopardize the continued existence of a listed species.

2.1.1.3. MAGNUSON–STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT (ESSENTIAL FISH HABITAT)

The Sustainable Fisheries Act of 1996 amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish EFH for federally managed marine and anadromous fisheries. The act requires federal agencies to consult with NMFS on any action that might adversely affect EFH. When NMFS finds that a federal or state action would adversely affect EFH, it is required to provide conservation recommendations.

2.1.1.4. U.S. FISH AND WILDLIFE COORDINATION ACT

Municipalities and other entities are required under the provisions of U.S. Fish and Wildlife Coordination Act (16 USC § 661-666) to coordinate with USFWS and CDFW with regard to projects that affect the waters of streams or other water bodies and wildlife and plant resources and their habitats.

2.1.1.5. MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act of 1918 (MBTA) (16 USC § 703 – 712) is an international treaty with Great Britain, Canada, Mexico, Japan, and Russia to protect migratory birds. The USFWS administers the MBTA. All native species of birds are protected during active nesting. The protection extends to the adult birds and nest contents, including eggs and nestlings. Non-native bird species are not provided protection by the MBTA.

2.1.1.6. SECTION 404 OF THE FEDERAL CLEAN WATER ACT

The USACE is responsible for the issuance of permits for the placement of dredged or fill material into waters of the United States (waters) pursuant to Section 404 of the Clean Water Act (CWA) (33 USC § 1344). As defined by the USACE at 33 CFR § 328.3(a)(3), waters are those that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide; tributaries and impoundments to such waters; all interstate waters including interstate wetlands; and, territorial seas.

2.1.1.7. SECTION 401 OF THE FEDERAL CLEAN WATER ACT

Pursuant to Section 401 of the Federal CWA, projects that require a USACE permit for discharge of dredge or fill material must obtain a water quality certification or waiver that confirms a project complies with State water quality standards before the USACE permit is valid. This is referred to as a Section 401 Water Quality Certification and is issued by the San Francisco RWQCB.

2.1.1.8. EXECUTIVE ORDER 11990 – PROTECTION OF WETLANDS

Executive Order 11990 – Protection of Wetlands (42 Federal Register [FR] 26921) was designed to protect wetlands and minimize adverse impacts associated with the destruction of wetlands. It requires all projects with a federal nexus to avoid construction in wetlands unless there is no alternative or the construction is designed in such a way that it includes all practicable measures to minimize impacts to wetlands.

2.1.1.9. EXECUTIVE ORDER 13112 – INVASIVE SPECIES

Executive Order 13112 – Invasive Species (64 FR 6183) establishes a national policy to prevent the introduction of invasive species and provide for their control, as well as to minimize the economic, ecological, and human health impacts that invasive species cause. Federal agencies whose actions may affect the status of invasive species are to identify such actions, use relevant programs, as budgetary constraints permit, to: (a) prevent introductions of invasive species; (b) detect and control populations of such species; (c) monitor populations of invasive species; (d) provide for restoration of native species; (e) conduct research leading to prevention of introductions and more effective control measures; and, (f) promote public education on invasive species.

2.1.2. State Laws and Regulations

2.1.2.1. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Project proponents are required under the California Environmental Quality Act of 1970 (CEQA) (Public Resources Code [PRC] § 21000 et seq.) to disclose, consider, and avoid or reduce significant effects to endangered, threatened, and rare species. Significant effects are identified in CEQA Guidelines as those that will substantially affect an endangered or rare animal or plant or its habitat, interfere substantially with the movement of any resident or migratory fish or wildlife species, or substantially diminish habitat for fish, wildlife, or plants.

2.1.2.2. CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act (CESA) generally parallels the main provisions of the FESA, but extends the take prohibitions to species proposed for listing. Section 2080 & 2081 of California Fish and Game Code (FGC) prohibits the take (defined as hunting, pursuing, catching, capturing, or killing) of endangered, threatened, or candidate species unless otherwise authorized by permit. CESA allows for take incidental to otherwise lawful development projects except for those species listed as fully protected. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any listed or candidate species, or result in destruction or adverse modification of essential habitat.

2.1.2.3. CALIFORNIA FULLY PROTECTED SPECIES (FGC SECTIONS 3511, 4700, 5050 AND 5515)

The Fully Protected Species classification is the State's first attempt to identify and provide additional protection to those animals that were considered rare or faced possible extinction. Lists were created for fish, mammals, birds, amphibians, and reptiles. However, this listing/review process was not as rigorous as required under CESA and a number of Fully Protected Species in California are actually fairly common. Fully Protected Species may not be taken or possessed at any time, and no licenses or permits may be issued for their take except for collection associated with scientific research and relocation of bird species to protect livestock. Under the State definition, "take" is an action that directly or indirectly kills species. The State definition does not include the terms "harass" and "harm" as the FESA take definition.

2.1.2.4. NATIVE PLANT PROTECTION ACT

The legal protection afforded to state-listed plants under the Native Plant Protection Act (NPPA) of 1977 (FGC § 1900 – 1913) includes provisions that prohibit the taking and possession of plants from the wild, and a salvage requirement for landowners and project proponents that may encounter rare plants during the course of implementing a project that may impact those species. If a landowner has been informed of a listed plant species on his property, CDFW must be notified at least 10 days in advance of any land use change that might affect the species or its habitat, thereby affording CDFW an opportunity to conduct a salvage operation. Candidate species are also protected by the NPPA.

CDFW has demonstrated a general policy of regarding many of the plants on the California Native Plant Society's (CNPS) Lists 1 and 2 as meeting the definitions of Chapter 10, Section 1901 of the NPPA. As such, those plants also qualify for protection under CEQA.

2.1.2.5. LAKE AND STREAMBED ALTERATION AGREEMENT

A watercourse and riparian zone is subject to the jurisdiction of CDFW under Section 1602 of the California FGC, a Lake and Streambed Alteration Agreement (FGC § 1600 – 1616) will be required if the project will: 1) divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake; 2) use materials from a streambed; or, 3) result in the disposal or deposition of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into any river, stream, or lake.

2.1.2.6. PORTER-COLOGNE ACT WATER QUALITY CONTROL ACT

The Porter-Cologne Act Water Quality Control Act (California Water Code [CWC], Division 7, § 13050(e)) is the water quality control law for California. The act is implemented by the SWRCB and the nine RWQCBs. The boards implement the permit provisions and certain planning provisions (Sections 205, 208, and 303) of the federal CWA. This means that the State issues one discharge permit for purposes of both state and federal law. Under state law, the permit is called a waste discharge requirement. Under federal law, the permit is called a National Pollutant Discharge Elimination System (NPDES) Permit.

2.1.2.7. CALIFORNIA FISH AND GAME CODE § 3503-3505, 3513, 3800, AND 4150

California FGC § 3503-3505, 3513, and 3800 make unlawful the take or possession of all migratory nongame birds and their nests. The majority of mammals found in California are protected under the California FGC § 4150, which states that all non-game mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by CDFW. Activities resulting in mortality of non-game mammals or disturbances that causes the loss of maternity colonies of bats may be considered "take" by CDFW.

2.1.2.8. STATE SENATE BILL 857 – FISH PASSAGES

State Senate Bill 857 (Fish Passages) (Streets and Highways Code (SHC) Article 3.5) requires an assessment for potential barriers to fish passage for any repair or construction project using state or federal transportation funds that affects a stream crossing on a stream where anadromous fish are, or historically were, found. In

addition, the statute requires related actions to systematically review and remediate barriers to fish passage related to transportation projects.

2.1.3. Federal Highway Administration Policies

2.1.3.1. MITIGATION OF IMPACTS TO WETLANDS AND NATURAL HABITAT

This regulation provides policies and procedures for the evaluation and mitigation for adverse impacts to wetlands and natural habitat from federal aid projects (23 CFR § 777). It states that it is Federal Highway Administration (FHWA) policy to permit, consistent with limits set forth in § 777.7, the expenditure of Title 23, USC, funds for activities required for the planning, design, construction, monitoring, and establishment of wetlands and natural habitat mitigation projects, and acquisition of land or interests therein. Section 777.7 provides parameters to evaluate the reasonableness of the public expenditure. The justification for the cost of proposed mitigation measures should be considered in the same context as any other public expenditure; that is, the proposed mitigation represents a reasonable public expenditure when weighed against other social, economic, and environmental values, and the benefit realized is commensurate with the proposed expenditure. Mitigation measures shall give like consideration to traffic needs, safety, durability, and economy of maintenance of the highway.

2.1.3.2. NEPA ASSIGNMENT MEMORANDUM OF UNDERSTANDING

On September 25, 2012, the FHWA and Caltrans signed the *Memorandum of Understanding Between the Federal Highway Administration and the California Department of Transportation Concerning the State of California's Participation in the Project Delivery Program Pursuant to 23 USC § 327* (NEPA Assignment Memorandum of Understanding [MOU]), which became effective on October 1, 2012. This MOU was signed pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21) and allows the Secretary of Transportation to assign and the State of California to assume all responsibilities for consultation and coordination with federal resource, regulatory, and land management agencies for most federal-aid highway projects in California. The assignment of environmental decision-making to Caltrans includes the federal-aid highway projects on federal lands and the FHWA's federal lands ("direct federal") projects when Caltrans designs and constructs these projects. By statute, the State is deemed to be a federal agency for these assigned responsibilities.

The proposed Project is receiving federal funding through the FHWA, and Caltrans has assumed FHWA's responsibilities under FESA for this consultation in accordance with 23 USC § 327, as described in the NEPA Assignment MOU.

2.1.4. Local Laws and Regulations

2.1.4.1. MARIN COUNTY NATIVE TREE PROTECTION AND PRESERVATION ORDINANCES

The Marin County Native Tree Protection and Preservation Ordinance (Section 22.27 of the Marin County Development Code [MCDC]), requires that a Tree Removal Permit be obtained prior to removing any protected and/or heritage tree within the county. Requirements for a Tree Removal Permit are detailed in Section 22.62 of the MCDC. The definition of a protected and heritage tree varies by species and is defined in Section 22 Article VIII (Definitions) of the MCDC. As a standard practice to maintain consistency with the Marin Countywide Plan, the Landscaping Objectives identified in Section 22.26.040 of the MCDC, the Single-Family Residential Design Guidelines, and the vegetation management requirements of the Marin County Fire Department or local Fire Protection District, the County may impose requirements including but not limited to the following:

- Replacement of trees at a ratio of three new appropriately sized and installed trees for each tree designated to be removed;
- For large properties, a management plan which designates areas of the property for preservation of stands of trees or saplings and replacement plantings as required; and,
- Removal of invasive exotic species.

2.2. Studies Required

2.2.1. Database Searches and Literature Review

A literature review was conducted to investigate the potential presence of special-status species and critical habitat within the BSA. A regional list of special-status wildlife and flora species was developed by querying the following databases, and each species was then evaluated to determine its potential to occur within the BSA:

- The species list from the Sacramento Office of the USFWS generated for the Project using their Information for Planning and Consultation (IPaC) System (USFWS 2020; Appendix B).
- The CNPS Inventory of Rare and Endangered Plants of California database was searched for the following nine U.S. Geological Survey (USGS) 7.5 minute topographic quadrangles (quads): San Geronimo (484C), San Rafael (467A),

Bolinas (467B), Double Point (467E), Petaluma River (484A), Petaluma (484B), Novato (484D), Point Reyes NE (485A), and Inverness (485D) (CNPS 2019).

- The California Natural Diversity Database (CNDDB) was queried for all occurrence records and critical habitat within 5 miles of the Project (CDFW 2019).

The results from these searches informed the preliminary technical studies that were conducted to evaluate special-status species for this NES. The result of the evaluations, including each species' potential for occurrence, is provided in Appendices C and D.

2.2.2. Field Reviews and Survey Methods

Preliminary technical studies were conducted to evaluate the potential for special-status plant and animal species to occur within the BSA. The studies included vegetation typing, a tree survey, rare plant surveys, wildlife habitat assessments, and assessment of wetlands and OWUS.

A previous iteration of this Project that did not go to construction had a BSA of approximately 0.62 acre. Field investigations to survey vegetation, wildlife, and wetlands were first conducted by Garcia and Associates (GANDA) botanists and biologists in 2015. Subsequently, in 2018, the proposed replacement bridge underwent design changes resulting in an increase in the BSA to approximately 2.31 acres. In 2019, GANDA botanists and biologists surveyed new Project areas and conducted verification surveys of the 2015 biological and aquatic surveys. New Project areas consist predominantly of roadway and landscaped/ruderal land cover. Rare plant protocol-level surveys were not conducted again in 2019. No significant changes have taken place in the BSA and land cover surrounding the BSA to necessitate new protocol-level surveys.

2.2.2.1. VEGETATION TYPING AND LAND COVER CLASSIFICATION

GANDA botanist Constance Ganong and GANDA biologist Rebecca Doubledee initially mapped vegetation types and assessed habitat for listed plant species within the BSA on April 21, 2015. GANDA botanist Nate Vorapharuek surveyed new areas of the BSA and confirmed previous vegetation and habitat mapping on February 25, 2019.

2.2.2.2. SPECIAL-STATUS PLANT SURVEYS

Protocol-level special-status plant surveys were conducted in the BSA on April 21 and July 8, 2015 to identify, map, and census any special-status plant populations within the BSA. Protocol-level surveys were floristic, meaning that all plant species encountered were identified to the taxonomic level needed to determine if they have special-status. Protocol-level surveys were completed according to the botanical survey guidelines of the USFWS (USFWS 1996a), CDFW (CDFW 2009), and the CNPS (CNPS 2001). Since the BSA has not undergone significant physical changes, and the new Project areas mainly consist of roadway and landscaped/ruderal land cover, no new protocol-level plant surveys were conducted in 2019. Surveys were conducted in 2019 to determine the presence of habitat in the BSA for rare plant species.

2.2.2.3. TREE SURVEY

GANDA botanist Constance Ganong and biologist Rebecca Doubledee conducted a pedestrian tree survey within the Project BSA on May 27, 2015. All trees of 4 inches or larger Diameter at Breast Height (DBH) were included in the inventory. Trees were marked with individual, numeric-stamped, aluminum tree tags and nails, and measured at DBH (4.5 feet from the base) with a DBH measuring tape. Tree tags were placed facing away from the road. If a main branch occurred at breast height, the DBH measurement was adjusted to below the branch. Trees with multiple trunks were treated as one tree if the trunk separation occurred above ground, but below DBH. Each trunk (up to a maximum of six) with DBH greater than or equal to 4 inches was measured and recorded for each tree. Trunks were considered separate trees if the trunk separation occurred below ground. Only living trees were included in this survey.

GANDA biologists recorded the following for each tree: tag number, tree species, DBH, and location. Tree data was recorded using a handheld Trimble Geoexplorer GPS data logger with sub-meter accuracy. For areas where foliage and/or topography blocked satellite reception to the GPS unit, offsets were recorded using a compass. Offsets were also taken when safety concerns or access restrictions prevented direct access to trees. Offsets are created by recording the distance to the tree from the GPS point, as determined using a compass bearing to provide direction from the GPS point to the tree. Distance and direction to the tree were recorded in feet and degrees, respectively. Tree locations were corrected later in GIS, based on individual recorded offsets. For trees that were inaccessible due to abundant growth of poison oak (*Toxicodendron diversilobum*) or other impenetrable foliage, steep slope, or unsafe

conditions around the trunk, an estimated DBH was recorded. Data were also recorded with pencil and paper as an alternate back-up to the GIS data.

Due to poor satellite reception, GPS accuracy was not always exact and not all trees could be mapped with precision. Because of the potential GPS inaccuracies and to ensure that all trees in the BSA were included, trees that appeared at or just outside the BSA were included in the survey. This method assured that no trees within the BSA were missed.

GANDA botanist Nate Vorapharuek surveyed the BSA on February 25, 2019 to confirm no major changes in the BSA to significantly affect results from 2015. Since the 2015 survey, trees may have changed in size. Trees in the recently expanded areas of the BSA will be surveyed prior to construction.

2.2.2.4. AQUATIC RESOURCE DELINEATION

A pre-field review of the BSA was conducted to identify potential wetlands and other waters, as well as information on hydrophytic vegetation, hydric soils, and wetland hydrology. Existing materials reviewed included geospatial wetlands and waters information provided online by the USFWS National Wetlands Inventory (NWI) (USFWS 2019) and aerial imagery of the BSA and vicinity. The San Geronimo California USGS 7.5-minute topographic quad (USGS 2019) was also reviewed. Soil types in the BSA were identified using the Web Soil Survey, a resource provided by the Natural Resources Conservation Service (NRCS) (NRCS 2015 and 2019).

GANDA botanist Constance Ganong and biologist Rebecca Doubledee conducted the field investigation on April 21, 2015 to delineate and assess potential waters of the U.S., including wetlands and water features in the BSA. GANDA botanist Constance Ganong resurveyed the BSA on February 25, 2019.

The BSA does not include wetlands, but does include OWUS. A waters delineation was conducted to determine the lateral extent of San Geronimo Creek and an ephemeral drainage that flows to San Geronimo Creek in the BSA.

Federal jurisdiction over non-wetland Waters of the U.S. extends to the Ordinary High Water Mark (OHWM) (USACE 2012). The OHWM is the defining element for identifying the lateral limits of non-wetlands waters or ephemeral or perennial riverine habitat. The OHWM of San Geronimo Creek and the unnamed intermittent creek were

determined by delineating the OHWM per the guidance in *Ordinary High Water Mark Identification* (USACE 2005).

2.2.2.5. WILDLIFE HABITAT ASSESSMENT

A reconnaissance-level wildlife habitat assessment of the BSA was conducted on May 4, 2015 by GANDA biologists Rebecca Doubledee, Rob Aramayo, and Dana Terry. The BSA was resurveyed on February 25, 2019 by GANDA biologist Karla Marlow. The purpose of the survey was to document the habitat within the BSA and assess the potential for the occurrence of special-status wildlife species. This assessment covered the entire reach of San Geronimo Creek within the current BSA, as well as a short section outside and downstream.

2.3. Personnel and Survey Dates

Table 1 summarizes the personnel and survey dates of each of the field studies.

Table 1. Summary of Personnel and Survey Dates.

Staff	Survey Dates	Company/affiliation
Wildlife Habitat Assessment		
Rebecca Doubledee, Rob Aramayo, and Dana Terry Karla Marlow	5/4/2015 2/25/2019	GANDA
Vegetation Typing		
Constance Ganong and Rebecca Doubledee Nate Vorapharuek	4/21/2015 2/25/2019	GANDA
Aquatic Delineation		
Constance Ganong and Rebecca Doubledee Constance Ganong	4/21/2015 2/25/2019	GANDA
Rare Plant Surveys		
Constance Ganong and Rebecca Doubledee	4/21/2015, 7/8/2015	GANDA
Tree Survey		
Constance Ganong and Rebecca Doubledee Nate Vorapharuek	5/27/2015 2/25/2019	GANDA

2.4. Agency Coordination and Professional Contacts

Caltrans will coordinate with USFWS, NMFS, and USACE representatives and Marin County will coordinate with CDFW and RWQCB representatives to overview habitats and proposed work locations within the BSA and to obtain appropriate permitting for the Project.

2.5. Limitations That May Influence Results

Initial field surveys were conducted in 2015. These surveys did not start until April 2015. Due to a later start, the rare plant survey on April 21, 2015 was past the blooming time (January through March) for the western leatherwood (*Dirca occidentalis*); however, the species was detectable during the July survey, during its leafing period.

The roosting bat habitat survey focused on identifying bats roosting in and on the Mountain View Bridge in May. There is a high degree of variation in bat activity on a seasonal basis. As a result, there is the possibility that additional numbers of bats or additional species may be present in the current bridge. Species such as the western red bat (*Lasiurus blossevillii*) and hoary bat (*Lasiurus cinereus*) might be present during the fall migration period. Other potential bat roosting habitat is likely present in the BSA in trees. Daytime investigation of potential roosts in trees generally does not result in a high degree of certainty about the presence or absence of bats. To mitigate this limitation, surveys were conducted as a habitat assessment to identify potentially suitable features (e.g., exfoliating bark, decaying branches, hollows, woodpecker holes).

Protocol-level surveys for federally listed wildlife species were not performed on behalf of this Project. The potential for federally listed wildlife species to occur within the BSA was based on the evaluation of habitat suitability for target species during field surveys and the inference of presence. The field surveys were augmented through a review of authoritative databases (e.g. CNDDB) for species occurrences in the Project vicinity, previous habitat assessments and reconnaissance-level site visits, and aerial photographs for suitable habitat within the dispersal distance of each species.

Surveys conducted in 2019 verified data collected in the initial 2015 surveys and surveyed new Project areas. The surveys were not as comprehensive as the original 2015 surveys, but did include a review of new information in databases (e.g. CNDDB).

Chapter 3. Results: Environmental Setting

This section includes a description of the overall biological context of the region, including the existing physical and biological conditions. The proposed Project occurs within the San Francisco Bay region, specifically on the Marin Peninsula of the North Bay and is limited to the BSA identified in Chapter 1. The proposed Project is located within the community of Lagunitas-Forest Knolls, an unincorporated community in Marin County, California.

3.1. Description of the Existing Biological and Physical Conditions

3.1.1. Study Area

The Project is located within the Marin Hills, which is part of the Pacific Coast Range Mountain system. The BSA is located within and adjacent to a series of local roads, including Sir Francis Drake Boulevard, Mountain View Road, and Corona Avenue. Mountain View Road is the site of the bridge relocation. San Geronimo Creek runs below Mountain View Road. The surrounding area is residential use.

The estimated area of the BSA is approximately 2.31 acres, 0.94 acre of which are the paved surfaces of Sir Frances Drake Boulevard, Mountain View Road, and Corona Avenue (Appendix A: Figure 2). The Project does not anticipate indirect or direct effects to federally listed species outside of the BSA. The PCA is the 0.61-acre area that will be directly affected by construction, either through temporary or permanent impacts.

3.1.2. Physical Conditions

The BSA is located within the San Geronimo Creek watershed. San Geronimo Creek runs east to west across the BSA. There is also a small unnamed drainage flowing into San Geronimo Creek in the southeast corner of the BSA that crosses under Corona Avenue. The San Geronimo Creek watershed is part of the larger Lagunitas Creek Watershed, which flows into Tomales Bay.

Elevation within the BSA ranges from approximately 220 feet above mean sea level (amsl) in the middle of the creek to 240 feet amsl along the southern boundary (Appendix A: Figure 1). The BSA is immediately surrounded by rural residential development in the community of Lagunitas-Forest Knolls. Beyond the rural

residences is the Gary Giacomini Open Space Preserve and the Marin Municipal Water District (MMWD) Mt. Tamalpais Watershed to the south and southeast; the Samuel P. Taylor State Park to the west; and, the French Ranch Open Space Preserve, Maurice Thorner Memorial Preserve, and Roy's Redwoods Preserve to the east. The hills immediately north and south of the BSA rise to approximately 435 feet amsl and 700 feet amsl, respectively (Appendix A: Figure 1).

The climate in the BSA is Mediterranean, characterized by moist, mild winters and dry summers. The Project is located on the western side of Marin County near Kent Lake, which gets more rain on average than areas closer to San Pablo Bay. The annual rainfall (as measured at Lake Lagunitas located approximately 7.2 miles southeast of the BSA) ranges from 18 to 116 inches, with an average annual rainfall of 52 inches (averaged over 135 years of data: MMWD 2014). Most of the rain occurs between October and April. Mean annual air temperature for Lagunitas is 58.5 degrees Fahrenheit.

According to the United States Department of Agriculture (USDA) NRCS's Soil Survey for Marin County, there is only one soil type within the BSA: Dipsea-Barnabe very gravelly loams, 50 to 75 percent slopes (NRCS 2019). The specific composition includes 50 percent Dipsea, 20 percent Barnabe, and 30 percent minor components (NRCS 2019). Soils in the Dipsea and Barnabe series consist of well-drained soils that formed in material from fine grained sandstone and shale (NRCS 2003a and 2003b). They are well drained soils, prone to rapid runoff, with moderate permeability. They typically occur on hills and mountainous uplands. Barnabe very gravelly loam is associated with north-facing slopes under coyotebrush (*Baccharis pilularis*), lupine (*Lupinus* spp.), annual grasses and forbs at 720 feet (NRCS 2003b). Dipsea very gravelly loam is associated with southwest-facing slopes of 60 degrees under redwood (*Sequoia sempervirens*), tanoak (*Notholithocarpus densiflorus*), huckleberry (*Vaccinium ovatum*), swordfern (*Polystichum munitum*), and some annual grasses at 600 feet elevation (NRCS 2003a).

3.1.3. Biological Conditions

The classification of vegetation used in this report is based on *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009). All major vegetation types known in California are described therein. The natural vegetation types are called "alliances," which are floristically defined vegetation types identified by their dominant and/or characteristic species. This manual also defines vegetation types strongly dominated by non-native plants that have become naturalized in California as "semi-natural

stands," which may occur across a myriad of environments. Six land cover types were identified within the BSA.

Table 2 lists the size of each land cover type and the anticipated impact area to each within the BSA. These land cover types are shown in Appendix A: Figure 3.

Table 2. Land Cover Types and Impacts within the BSA.

Land Cover Type	Total Area within BSA (Acres)	Temporary Impacts (Acres)	Permanent Impacts (Acres)	Total Impacts (Acres)
California bay forest/California buckeye groves	0.05	0.02	0.00	0.02
Oregon ash forest/Red alder grove	0.28	0.15	0.04	0.19
Bigleaf maple/Oregon ash forest	0.36	0.13	0.06	0.19
Waters	0.21	0.12	0.04	0.16
Landscaped/Ruderal	0.47	0.03	0.01	0.04
Road	0.94	N/A	N/A	N/A
Total	**2.31**	**0.45**	**0.15**	**0.60**

3.1.3.1. CALIFORNIA BAY FOREST (*UMBELLULARIA CALIFORNICA* FOREST ALLIANCE) / CALIFORNIA BUCKEYE GROVES (*AESCULUS CALIFORNICA* WOODLAND ALLIANCE)

California bay (*Umbellularia californica*) is an evergreen broadleaf tree that grows to approximately 80 feet in height. Stands occur near the coast and inland in both mesic and riparian settings, usually in a patchwork with stands of other evergreen forest or chaparral alliances. In many cases, California bay is the only tree species in older stands with few shrubs and herbs present.

California buckeye (*Aesculus californica*) is a large shrub or tree that may grow to approximately 25 feet tall. California buckeye inhabits varied slopes and topography and is generally found in soils that are shallow and moderately to excessively drained.

Within the BSA, California bay forest and California buckeye groves occur together as codominants across the Mountain View Road Bridge and partially cover the roadway and the small, unnamed intermittent creek that flows to San Geronimo Creek.

The California bay forest/California buckeye groves located on the southern side of Mountain View Road and Corona Avenue are further away from the creek. Wildlife observed in this area include mule deer (*Odocoileus hemionus*), California scrub jay (*Aphelocoma californica*), and California quail (*Callipepla californica*). Common

amphibians and reptiles found on the forest floor in the mixed evergreen community include ensatina (*Ensatina eschscholtzii*), California slender salamander (*Batrachoseps attenuatus*), western fence lizard (*Sceloporus occidentalis*), and ring-necked snake (*Diadophis punctatus*). Common mammals include mule deer, dusky-footed woodrat (*Neotoma fuscipes*), and western gray squirrel (*Sciurus griseus*).

3.1.3.2. OREGON ASH FOREST (*FRAXINUS LATIFOLIA* FOREST ALLIANCE) / RED ALDER GROVE (*ALNUS RUBRA* FOREST ALLIANCE)

Oregon ash (*Fraxinus latifolia*) is a deciduous hardwood that may attain a height of approximately 80 feet and an age of 250 years. Oregon ash habitat includes riparian corridors, incised canyons, seeps, stream banks, and terraces.

Red alder (*Alnus rubra*) is a deciduous hardwood that may attain a height of 130 feet and an age of 100 years. Red alder stands primarily occur near the coast in California as both riparian and upland stands. Its habitats include stream and river backwaters, banks, bottoms, floodplains, mouths, terraces, and slopes of all aspects.

Within the BSA, Oregon ash and red alder occur together as codominants along San Geronimo Creek west of Mountain View Road Bridge. Other species which occur west of the bridge within the BSA include bigleaf maple (*Acer macrophyllum*) and California bay.

Oregon ash and red alder within the BSA constitute riparian forest. Riparian forest habitat provides water, forage, breeding areas, migration and dispersal corridors, and thermal cover on a year-round and seasonal basis for an abundance of wildlife (Riparian Habitat Joint Venture [RHJV] 2000). Amphibians and reptiles that typically use this habitat include the Pacific treefrog (*Pseudacris regilla*), California newt (*Taricha tarosa*), and coast gartersnake (*Thamnophis elegans terrestris*). Mammals that use this habitat for foraging and cover include northern raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginianus*), mule deer (*Odocoileus hemionus*), and numerous bat species.

Riparian woodlands provide important nesting habitat for a variety of migratory birds such as Pacific-slope flycatcher (*Empidonax difficilis*), warbling vireo (*Vireo gilvus*), Swainson's thrush (*Catharus ustulatus*), black-headed grosbeak (*Pheucticus melanocephalus*), and yellow warbler (*Setophaga petechia*) (a California Species of Special Concern). Black phoebe (*Sayornis nigricans*), house finch (*Haemorhous mexicanus*), and barn swallow (*Hirundo rustica*) may use the bridge itself for nesting.

3.1.3.3. BIGLEAF MAPLE (*ACER MACROPHYLLUM* FOREST ALLIANCE) / OREGON ASH FOREST (*FRAXINUS LATIFOLIA* FOREST ALLIANCE)

Bigleaf maple is a deciduous hardwood that grows up to 70 feet in height and lives to 300 years. It occurs in habitats with different moisture regimes, from moist stream terraces to dry talus, but attains its best development on deep alluvial soils. The best developed stands are scattered along alluvial terraces, in adjacent side drainages, and at springs along seeps.

Within the BSA, bigleaf maple and Oregon ash occur together as codominants along San Geronimo Creek east of Mountain View Road Bridge. Other species that occur east of the bridge within the BSA include red alder and California buckeye. Bigleaf maple and Oregon ash also make up part of riparian forest in the BSA.

3.1.3.4. WATERS

Waters are any open waters, including ponds and perennial or intermittent creeks. In the BSA, waters include San Geronimo Creek and an ephemeral drainage that flows north-to-south through a culvert beneath Corona Avenue to San Geronimo Creek. San Geronimo Creek is a perennial creek and was flowing at the time of the 2015 and 2019 field delineations. The ephemeral drainage was not flowing during the time of the 2015 field delineation, but was during the 2019 survey. The waters land cover classification occurs entirely underneath the California bay forest/California buckeye grove, Oregon ash forest/white alder grove, bigleaf maple/Oregon ash forest vegetation types and the road land cover type.

San Geronimo Creek provides suitable habitat for a variety of fish species and is connected to Tomales Bay with no barriers, such as dams or reservoirs. Fish species observed in the creek were threespine stickleback (*Gasterosteus aculeatus*) and Tomales roach (*Lavinia symmetricus* ssp. 2). San Geronimo Creek provides important rearing habitat for the Central California Coast (CCC) Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss irideus*) and the CCC Evolutionarily Significant Unit (ESU) of coho salmon (*O. kisutch*). Steelhead are listed as federally threatened and coho are listed as federally endangered. The Tomales roach, a subspecies of the more common California roach, is a California Species of Special Concern (CDFW 2018).

3.1.3.5. LANDSCAPED/RUDERAL

Landscaped/ruderal areas have been impacted by grading, mowing, filling, and residential and commercial use. Monterey pine (*Pinus radiata*), incense cedar (*Calocedrus decurrens*), and deodar cedar (*Cedrus deodara*) are planted along Sir Francis Drake Boulevard, opposite the bridge, east of the residential driveway within the BSA. Ruderal vegetation such as non-native, invasive forbs and grasses also occur within this area of the BSA as well. Ruderal vegetation is roadside or trailside vegetation composed primarily of weedy, non-native plants, such as poison hemlock (*Conium maculatum*), wild fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), and wild oats (*Avena* spp.). It also occurs within and adjacent to landscaped areas. Ruderal vegetation is not a natural vegetation type, and there is no equivalent alliance in *A Manual of California Vegetation* (Sawyer et al. 2009).

3.1.3.6. ROAD

The road surfaces within the BSA are the local streets of Mountain View Road, Sir Francis Drake Boulevard, and Corona Avenue. Special-status wildlife species are not expected to use paved road surfaces but may cross the road during dispersal or foraging.

3.1.3.7. HABITAT CONNECTIVITY

Riparian forest habitat provides migration and dispersal corridors for an abundance of wildlife (RHJV 2000). For many animals, it is not only the quality of one patch of habitat, but also the ability to move among multiple habitat patches that makes survival possible. The BSA is located within a rural residential community surrounded by protected habitat (Gary Giacomini Open Space Preserve, MMWD Mt. Tamalpais Watershed, Samuel P. Taylor State Park, French Ranch Open Space Preserve, Maurice Thorner Memorial Preserve, and Roy's Redwoods Preserve). Most of these preserves are already connected to each other via natural lands, but the aquatic habitat of San Geronimo Creek may be important dispersal habitat for aquatic animals such as California red-legged frogs (*Rana draytonii*), foothill yellow-legged frogs (*Rana boylii*), and western pond turtles (*Emys marmorata*).

San Geronimo Creek is occupied by coho salmon and steelhead, adults pass through the BSA during spawning season, and juveniles pass back through it during other seasons to reach the Pacific Ocean. The San Geronimo Creek watershed is part of the larger Lagunitas Creek watershed, which flows into Tomales Bay. There are no obstructions downstream that would prevent fish passage up to the BSA.

3.2. Regional Species and Habitats and Natural Communities of Concern

Appendices C and D present an assessment of the likelihood of special-status species and their habitats to occur within the BSA based on a characterization of habitats on-site and in the surrounding region, CNDDB occurrence data, the location of designated critical habitat units for federally listed species, and general knowledge of the habitat requirements and distribution of the species. Species that were determined to have potential to occur, including species that may only occur during migration and during foraging, are evaluated in more detail in Chapter 4. Species that are not likely to occur within the BSA are not considered further in this report. Based on the results of biological studies conducted for the Project and recent queries of the CNDDB, CNPS Inventory, and USFWS and NMFS species lists, the proposed Project could potentially affect several special-status species.

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

4.1. Habitats and Natural Communities of Special Concern

Natural Communities of Special Concern are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects (CDFW 2019b). These communities may or may not contain special-status species or their habitat. These habitats are also considered to be of special concern because there are federal, state, or local laws regulating their development. Waters of the U.S. and riparian woodlands are the two Natural Communities of Special Concern present within the BSA.

4.1.1. Wetlands and Water Features

Waters include any perennial or intermittent creeks, which within the BSA include a perennial stream (San Geronimo Creek) and an ephemeral drainage. Waters also include wetlands; no wetlands are within the BSA. Other waters of the U.S. total approximately 0.21 acre in the BSA. In-stream work in San Geronimo Creek may be limited to the dry season (June 15 to October 15) to reduce impacts. San Geronimo Creek will be protected from debris during construction but workers will need to be in the creek when installing and removing these protections. The Project will result in 0.12 acre of temporary impacts to these waters. Approximately 0.04 acre of permanent impacts to waters are anticipated.

4.1.1.1. SURVEY RESULTS

The OHWM of San Geronimo Creek within the BSA was estimated to be approximately 31 feet wide and the OHWM of the ephemeral drainage was estimated to be approximately 5 feet wide (Appendix A: Figure 4). Physical characteristics used to delineate the OHWM for this Project included:

- Presence of a well-defined bank;
- Lack of vegetation within bed and significant vegetation cover at bank;
- Distinct change in average sediment texture; and,
- Presence of drift and debris.

A total of 0.21 acre (357 linear feet) of OWUS were delineated within the boundaries of the BSA (Table 3 and Appendix A: Figure 4). No wetlands were observed in the

BSA. Both waters are considered jurisdictional since San Geronimo Creek feeds into Lagunitas Creek, which eventually terminates in Tomales Bay.

Table 3. Waters in the BSA.

Feature Type	Area (acres)	Linear Feet
Perennial Creek (San Geronimo)	0.199	282
Ephemeral Drainage	0.008	75
Waters of the U.S. Total	**0.207**	**357**

4.1.1.2. PROJECT IMPACTS

Approximately 0.16 acre of potentially jurisdictional waters will experience temporary and permanent impacts. Temporary impacts, affecting 0.12 acre, include access for construction equipment into the creek channel and the diversion of low creek flow.

The creek banks will be permanently affected by the placement of RSP to provide stabilization of the banks and prevent scouring at the bridge location. The RSP will result in permanent impacts to approximately 0.038 acre of streambank. The widened bridge deck, which is an increase of 3 feet, will also increase shading over San Geronimo Creek by 0.003 acre.

4.1.1.3. AVOIDANCE AND MINIMIZATION EFFORTS

The potential for adverse impacts to waters will be minimized through the implementation of Measure #37. This measure includes implementing temporary and permanent BMPs outlined in Section 7-1.01G of the Caltrans Standard Specifications.

4.1.1.4. COMPENSATORY MITIGATION

Disturbed areas on the creek banks will be re-vegetated with a native grass seed mix. Native riparian trees will be planted in a 3:1 ratio in appropriate locations near the bridge within the creek bank and top of bank. Riparian plants will also be planted below the top of bank in disturbed areas outside of the new RSP footprint.

4.1.1.5. CUMULATIVE IMPACTS

The resource study area for examining potential cumulative impacts to jurisdictional waters is defined by the watershed boundary for San Geronimo Creek. Cumulative projects that would have an impact on wetland and water features include those that have both direct and indirect impacts leading to an overall reduction in quantity, functionality, and longevity of jurisdictional features. Several past, current, or future

projects in the area around San Geronimo Creek and its tributaries had, or have, the potential to affect jurisdictional wetland and water features. A brief summary of the known projects is provided, as well as planned or completed impacts to jurisdictional wetlands or waters and the associated mitigation provided for each project. Identified projects include:

San Geronimo Creek Coho Habitat Restoration Projects – The Marin County Resource Conservation District constructed two restoration projects to restore coho habitat in San Geronimo Creek in the summer of 2019. One was located on the Greene-McGuinn property, about 1.3 miles east of the BSA, and the other was located on the Snyder-Stanger property, about 0.1 miles west of the BSA. Habitat restoration includes construction of in-stream and floodplain habitat improvements for coho salmon and other species in the project location. These projects are covered under a Mitigated Negative Declaration CEQA document that included AMMs to avoid impacts to jurisdictional wetlands or waters.

22 Resaca Avenue single-family residence – The construction of a single-family home on a 1- to 2-acre unit of land adjacent to Resaca Avenue is currently under permitting review with the County of Marin.

Sir Francis Drake Boulevard Roadway Rehabilitation – In 2017, Marin County resurfaced the Sir Francis Drake Boulevard roadway from the City of Fairfax limit to Samuel P. Taylor State Park (Shafter Bridge) to repair deterioration. The project was covered under an Environmental Impact Report that included AMMs to avoid impacts to jurisdictional wetlands or waters.

All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The amount and quality of wetland habitat being impacted by the proposed Project are expected to be minimal. Impacts from the proposed Project will be mitigated through on-site mitigation activities, or, if required, at an off-site location. The County does not anticipate any unmitigated cumulative effects to jurisdictional wetland or water features as a result of the proposed Project.

4.1.2. Riparin Woodland

Riparian communities are considered special-status natural communities due to their limited distribution in California. Riparian vegetation is also regulated by the CDFW

under Section 1602 of the FGC. This section discusses their potential to be affected by Project activities, specific AMMs to protect them, possible compensatory mitigation, and cumulative effects.

4.1.2.1. SURVEY RESULTS

The vegetation types labeled as Oregon ash forest/red alder grove (0.28 acre) and bigleaf maple/Oregon ash forest (0.36 acre) (Appendix A: Figure 3) are the areas of the BSA that fall within CDFW's jurisdiction for a Section 1600 Lake or Streambed Alteration Agreement and may be impacted by the proposed Project.

4.1.2.2. PROJECT IMPACTS

Several trees, including Oregon ash and bigleaf maple, on the east and west sides of the existing bridge may require trimming. This Project is anticipated to require minimal tree removal. It is estimated that six trees may need to be removed from the western and southeastern banks for construction access and in order to accommodate the new bridge height.

4.1.2.3. AVOIDANCE AND MINIMIZATION EFFORTS

The potential for adverse impacts to riparian woodland will be minimized through the implementation of tree protection (Measure #18) and Measure #41. Measure #41 includes implementing temporary and permanent BMPs outlined in Section 7-1.01G of the Caltrans Standard Specifications.

4.1.2.4. COMPENSATORY MITIGATION

Once the bridge construction and RSP placement is complete, exposed and disturbed areas will be re-vegetated. A native grass seed mix will be applied to new earthen slopes in front of the abutments, wingwalls, and retaining walls on the north and south sides of bridge, as well as to areas disturbed for creek access. Native riparian trees will be planted at a 3:1 ratio near top of bank of the new roadway approach embankments on the southeast side of the bridge. Riparian plants will also be planted below the top of bank in disturbed areas outside of the new RSP footprint.

4.1.2.5. CUMULATIVE IMPACTS

Several past or planned future projects had, or have, the potential to affect riparian woodland. A brief summary of the known projects is provided in Section 4.1.1.5.

All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The amount and quality

of riparian woodland being impacted by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to riparian woodland as a result of the proposed Project.

4.2. Special-status Plant Species

4.2.1. Survey Results

Based on literature and database searches, prior botanical surveys, and familiarity with the region, a total of 86 plant species were initially evaluated (Appendix C). Of these, 11 species were determined to have low potential to occur within the BSA. Rare plant species with low or no potential to occur are not considered further in this report but are identified and briefly discussed in Appendix C. A rare plant survey was conducted in May and July 2015. A list of plants observed during this survey can be found in Appendix F. Surveys to verify potential habitat for rare plants were conducted in February 2019. No federally or state-listed plants, or plants with California Rare Plant Ranks (CRPR) were observed in the BSA.

4.3. Trees

4.3.1. Survey Results

In 2015 surveys, a total of 75 trees with a DBH class of 4 inches or greater were recorded within the BSA (Table 4, Appendix A: Figure 6). Thirty-six percent (27 trees) of all trees surveyed had two or more trunks with a DBH greater than 4 inches (Table 4). The average DBH was 10.2 inches, with a standard deviation of 5.9 inches. The median DBH was 8 inches. The largest tree measured was a coast redwood (*Sequoia sempervirens*), with a DBH of 32 inches (Table 5). The larger tree species, trees with a DBH of 15 inches or greater, were Oregon ash, red alder, California bay, and coast redwood.

Nine different tree species were identified within the BSA and all but one of them are native to California (Table 4). The only non-native was an ornamental plum (*Prunus* sp.). The most abundant species was the California bay (31 trees), followed by the California buckeye (19 trees). The area immediately surrounding San Geronimo Creek was dominated by bigleaf maple, Oregon ash, and red alder. The upland habitat south of Mountain View Road and Corona Avenue was dominated by California bay and California buckeye (Appendix A: Figure 6).

Since the 2015 survey, trees may have changed in size. From land cover surveys in 2019, botanists have confirmed no significant change to landscape in the BSA. Trees in the recently expanded areas of the BSA will be surveyed prior to construction.

A complete list of all trees tagged and a map with tag identification numbers in 2015 is included in Appendix E.

Table 4. Tree species present in the BSA.

Common Name	Scientific Name	Status	Abundance	Number with Multiple Trunks
Arroyo willow	*Salix lasiolepis*	Native	1	0
Big-leaf maple	*Acer macrophyllum*	Native	7	3
California bay	*Umbellularia californica*	Native	31	11
California buckeye	*Aesculus californica*	Native	19	9
Coast live oak	*Quercus agrifolia*	Native	1	1
Oregon ash	*Fraxinus latifolia*	Native	9	0
Plum	*Prunus* sp.	Non-Native	1	0
Red alder	*Alnus rubra*	Native	5	3
Coast redwood	*Sequoia sempervirens*	Native	1	0
		Total	**75**	**27**

Table 5. Tree Species by DBH Class within the BSA

	DBH in Inches*																			
Species	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**20**	**22**	**29**	**32**	**Total**
Arroyo willow			1																	**1**
Big-leaf maple		1		1	4				1											**7**
California bay	3	3	1	3	4	2	1	3	3	2	1	1		1		1	2			**31**
California buckeye	1	3	4	3	1		1	4	1	1										**19**
Coast live oak											1									**1**
Oregon ash		2	3			1					1		1					1		**9**
Plum			1																	**1**
Red alder					1				1					1	1			1		**5**
Redwood																			1	**1**
Total	**4**	**9**	**10**	**7**	**10**	**3**	**2**	**7**	**6**	**3**	**3**	**1**	**1**	**2**	**1**	**1**	**2**	**2**	**1**	**75**

*Columns with zeros are not shown

4.3.2. Avoidance and Minimization Efforts

The AMMs listed in Section 1.3 will reduce the effects to trees during Project construction. These measures include tree protection (Measure #18), preconstruction tagging (Measure #29), restoration and revegetation of temporarily impacted areas (Measure #30), which includes the planting of trees where appropriate. Specific tree preservation measures will be addressed during the permitting phase of the Project.

4.3.3. Project Impacts

It is anticipated that six trees will be removed for Project construction. Some trees located in temporary impact areas may be preserved depending on the specific activity occurring near them. During construction, the County will make an effort to reduce impacts to trees in temporary impact areas to the greatest extent possible. Preconstruction tagging will appropriately identify trees to be removed prior to bridge construction.

4.3.4. Compensatory Mitigation

The County will provide tree replacement on-site to the maximum extent possible and an off-site planting strategy will be developed in coordination with CDFW and RWQCB during the permitting process to address the balance of the tree mitigation needs. Trees removed from the riparian zone will be included in the CDFW 1602 Lake and Streambed Alteration Agreement application. Trees in the upland areas will be compensated for under CEQA on-site and off-site as described above.

4.3.5. Cumulative Impacts

Several past or planned future projects had, or have, the potential to affect trees. A brief summary of the known projects is provided in Section 4.1.1.5.

All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. All trees removed as part of the projects in the resource study area will be replaced at a minimum of 1:1 ratio and typically at a higher ratio dependent on the resource agency requirements. The specific tree removal area and tree replacement area may not be the same or within the resource study area due to various reasons, including limited tree planting space within the creek bed, safety issues with planting trees close to the bridge and nearby roads, and limitations due to property ownership. The trees being impacted by the proposed

Project will be mitigated through replanting on-site to the maximum extent possible and off-site if additional planting areas are required. This Project, in addition to all other projects analyzed for cumulative effects, will meet resource agency requirements for tree mitigation. The County does not anticipate any unmitigated cumulative effects to trees as a result of the proposed Project.

4.4. Special-status Animal Species

Based on literature and database searches and familiarity with the region, a total of 40 wildlife species were initially assessed for a potential to occur within the BSA (Appendix D). After conducting a wildlife habitat assessment and reviewing the habitat preferences, geographic distribution, and known locations of all taxa on the preliminary list, 17 of these species were dropped from consideration based on a lack of suitable habitat within the BSA and are not discussed further in this report, with the exception of marbled murrelet (*Brachyramphus marmoratus*). The marbled murrelet, does not occur in Marin County, but is discussed below because the BSA is adjacent to designated Critical Habitat.

4.4.1. Coho Salmon – Central California Coast (CCC) Evolutionary Significant Unit (ESU)

The coho salmon Central California Coast (CCC) Evolutionary Significant Unit (ESU) (*Oncorhynchus kisutch* pop. 4) was federally listed as endangered on October 31, 1996 (NMFS 1996) and state listed as endangered on March 30, 2005. Critical habitat for CCC coho was designated on May 5, 1999 (NMFS 1999), and EFH was designated August 1999. The CCC ESU encompasses all naturally spawned populations in rivers and tributaries from the San Lorenzo River in Santa Cruz County north to Punta Gorda in Mendocino County.

Coho salmon have a relatively fixed three-year life cycle. Adults typically return to their natal stream in the fall to spawn. In California, adult coho typically return to spawning areas between November and January, often moving upstream with the high water of winter storms. Most spawning occurs in December and January. Adults spawn in clean gravels and cobbles, typically at tail crests or riffles where surface water is hydraulically forced into the gravel, thereby keeping the gravels clean and the eggs well oxygenated. Adult coho spawn in smaller waters and tributaries than Chinook salmon, although there is some overlap with habitats chosen by steelhead. Juvenile coho are found in all habitat types, and habitat preferences change with seasonal

changes to stream conditions. Coho usually segregate themselves from steelhead and other salmonids, often choosing deeper waters with more woody debris and cover. Juvenile coho remain in their natal streams for their full first year, and begin emigrating to the ocean during the spring of their second year. Coho require cool water temperatures, and are excluded from streams where summer water temperatures exceed 22-25 degrees Celsius for extended periods of time; however, some data suggests that the upper thermal limit may be closer to 18 degrees Celsius (Moyle 2002).

In California, most coho remain in the ocean for the end of their second year and their third year, before returning as adults at the end of their third year. Some precocious males return as two-year-old 'Jacks.' All coho adults die after spawning.

4.4.1.1. SURVEY RESULTS

The BSA is within the historic and current range of coho. No sampling surveys were conducted in San Geronimo Creek. The stream reach is within a known spawning and rearing area (Appendix A: Figure 7). However, the BSA, which includes area 135 feet on either side of the existing bridge structure, does not include suitable spawning habitat. There is suitable rearing habitat for juvenile coho within the BSA, and the BSA is expected to act as passage for adults during spawning season, and as juveniles during other seasons. The proposed Project is within CCC coho critical habitat (Appendix A: Figure 9). The BSA is also within the USGS Hydrologic Unit #18050005, which is EFH for coho. A CNDDB observance of coho salmon was recorded in 2003 within a Lagunitas Creek drainage 1.7 miles northwest of the BSA.

For the reasons described above, the potential for CCC coho to occur in the BSA is considered to be high.

4.4.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to coho salmon during Project construction. Species-specific measures include work period (Measure #4), preconstruction surveys (Measure #7), biological monitoring (Measure #13), water diversion and dewatering (Measure #16), coho salmon and steelhead critical habitat and EFH protection (Measure #17), creek bed and bank protection (Measure #19), fish and wildlife refugia protection (Measure #21), debris containment (Measure #22), and restoration (Measure #30). If an individual is found during preconstruction surveys, work will not commence until a qualified biologist relocates the individual outside of the work area.

4.4.1.3. PROJECT IMPACTS

Coho salmon have a high potential to occur within the BSA. Project construction activities will occur in the summer months during low flow conditions (June 15 to October 15). At this time, only juvenile coho would be expected in the BSA.

If present, direct impacts to this species from temporary disturbances associated with the Project are anticipated due to fish relocation, creek dewatering, and a temporary increase in sediment mobilization. If juvenile coho are relocated out of the construction area prior to dewatering, relocation efforts could result in injury or mortality to pre-smolt juvenile steelhead; additionally, if juveniles escape capture, they may be adversely affected by dewatering activities. In the past, NMFS has estimated that fish rescue and dewatering activities in similar situations would result in mortality to less than 3 percent of individuals present (NMFS 2014). Additional direct impacts to coho include the temporary loss of suitable habitat during Project construction from dewatering of the Project site.

Direct impacts to coho habitat, including the EFH, associated with Project activities include permanent and temporary impacts to the creek bed and banks including temporary disturbance to and/or temporary alteration of the creek channel from demolition and removal of the existing bridge, construction of the new bridge, and all associated Project activities (access to the creek bed, slope recontouring, RSP placement, and bank stabilization). Direct impacts are mostly temporary, short-term impacts that would be minimized or avoided by implementation of Project AMMs listed above and detailed in Section 1.3. Following construction, restoration of the creek's flow, bed, and banks to previous conditions and potentially improving habitat by increasing native riparian plantings would maintain or improve habitat conditions for coho.

Unavoidable indirect impacts to coho salmon and habitat may include competition with other juveniles at relocation sites; increases in downstream turbidity during re-watering and during the first high flows following construction as a result of Project work on the banks and within the channel; changes to water temperature due to obstruction or alteration of flow and/or due to removal of thermal refugia, including shade and deep pools; disturbance to, or removal of, forage (such as macroinvertebrate communities in dewatered areas); removal of cover such as aquatic and emergent vegetation, boulders, and woody debris; and, disturbances to substrates. These indirect impacts are expected to be minor and temporary. Indirect impacts can be avoided or minimized with the

implementation of Project AMMs including construction BMPs to avoid pollution and minimize erosion, stockpiling native soils/gravels and materials to be replaced at the end of construction, restoration of the creek bed and banks to pre-existing conditions, and planting of native vegetation in disturbed areas.

Approximately 0.04 acre of permanent impacts will result from the placement of fill in coho habitat where RSP is installed below the OHWM. The widened bridge deck would increase permanent shading over San Geronimo Creek by approximately 131 square feet. Other potential permanent impacts to coho may include changes in water temperature due to removal of thermal refugia including shade and deep pools and removal of cover such as trees, boulders, and woody debris.

Approximately 0.12 acre of coho habitat would experience temporary impacts during construction. Temporary impacts include construction equipment access areas; the potential diversion of creek flow; disturbance to the creek bed and banks during removal of the old bridge and construction of the new bridge; temporary loss of habitat during Project construction (from dewatering); changes to water quality due to turbidity and sedimentation; changes to water temperature due to obstruction or alteration of flow and/or decreased shade from tree removal; disturbance to, or removal of, forage (such as macroinvertebrate communities in dewatered areas); removal of cover such as aquatic and emergent vegetation; and disturbances to substrates.Compensatory

4.4.1.4. MITIGATION

The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge. RSP to be installed will prevent erosion and degradation of impacted areas. Additionally, specific AMMs detailed in Section 1.3, such as removal of invasive plants and restoration and revegetation of the creek bed and banks, will reduce potential effects to coho salmon and improve species' habitat.

Coordination and consultation with NMFS will determine any further compensatory mitigation for this species.

4.4.1.5. CUMULATIVE IMPACTS

The resource study area for examining potential cumulative impacts to coho salmon includes the CDFW's coho distribution layer within San Geronimo Creek and its tributaries, along with a one-mile buffer (CalFish 2007). Cumulative projects that

would have an impact on coho include those that have both direct and indirect impacts leading to an overall reduction in quantity, functionality, and longevity of coho habitat.

Several past or planned future projects within or near the PCA had or have the potential to affect coho. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The amount and quality of habitat being impacted by the proposed Project will be mitigated through a combination of on-site enhancements and restoration, and off-site compensation as determined during the Section 7 Consultation process. Impacts from the proposed Project will not affect the persistence of local populations of coho salmon in the San Geronimo Creek watershed. Impacts from the proposed projects within the resource study area are not anticipated to impact spawning habitat or create additional passage barriers. The County does not anticipate any unmitigated cumulative effects to coho salmon as a result of the proposed Project.

4.4.2. Steelhead Trout – Central California Coast (CCC) Distinct Population Segment (DPS)

The CCC distinct population segment (DPS) of steelhead trout (*Oncorhynchus mykiss irideus* pop. 8) is listed as federally threatened. Critical habitat for the CCC steelhead DPS was designated on May 5, 1999 and revised Sept 5, 2005 (NMFS 2005). Their range is defined by NMFS as all naturally spawned populations from the Russian River south to Aptos Creek in Santa Cruz County, including drainages of San Francisco, San Pablo, and Suisun bays eastward to Chipps Island at the confluence of the Sacramento and San Joaquin rivers.

Steelhead employ a variety of life history strategies that take advantage of the diversity of river systems and regional conditions to which they are adapted. CCC DPS steelhead have a typical “winter” migration pattern and an “ocean-type” gamete development, which means that adults arrive at their spawning grounds with their eggs close to maturity, and are therefore ready to spawn within a short period of arriving (Moyle 2002). Steelhead typically choose steeper-gradient stream reaches and spawn in the middle and upper reaches of the watersheds, either the mainstem or tributaries. Steelhead typically begin returning to San Francisco Bay in late fall, with most immigration occurring from December through February. Spawning takes place from January through April in freshwater streams. Adults spawn in clean gravels and cobbles, typically at tail crests or riffles where surface water is hydraulically forced

into the gravel, thereby keeping the gravels clean and the eggs well oxygenated. Juvenile steelhead are found in multiple habitat types, with habitat preferences changing with seasonal changes to stream conditions. Steelhead require cool water temperatures, and are excluded from streams where summer water temperatures exceed 23-27 degrees Celsius (73.4-80.6 degrees Fahrenheit) for extended periods of time. In California, most juvenile steelhead remain in their natal streams for two years before emigrating to the ocean during the late spring or early summer, although strategies from one to four years of freshwater residence are known. Estuaries are often an important rearing area for juvenile steelhead on their way to the ocean. Steelhead can remain in the ocean for one to four years before returning to spawn the first time, with two years being the norm. However, unlike Chinook and coho, steelhead do not necessarily die after spawning.

4.4.2.1. SURVEY RESULTS

The BSA is within the historic and current range of steelhead. This reach of San Geronimo Creek is within a known spawning and rearing area (Appendix A: Figure 7) (GANDA Fisheries Biologist Rob Aramayo, personal communication). However, the BSA, which includes 135 feet on either side of the existing bridge structure, does not include good spawning habitat. There is suitable rearing habitat within the BSA, and the BSA is expected to act as passage for adults during the winter spawning season and as juveniles in other seasons. The proposed Project is also within steelhead critical habitat (Appendix A: Figure 9).

For the reasons described above, the potential for steelhead to occur in the BSA is considered to be high.

4.4.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to steelhead trout during Project construction. Species-specific measures include work period (Measure #4), preconstruction surveys (Measure #7), biological monitoring (Measure #13), water diversion and dewatering (Measure #16), coho salmon and steelhead critical habitat and EFH protection (Measure #17), creek bed and bank protection (Measure #19), fish and wildlife refugia protection (Measure #21), debris containment (Measure #22), and restoration (Measure #30). If an individual is found during preconstruction surveys, work will not commence until a qualified biologist relocates the individual outside of the work area.

4.4.2.3. PROJECT IMPACTS

CCC DPS steelhead trout have a high potential to occur within the BSA. Project construction activities will occur in the summer months during low flow conditions (June 15 to October 15). At this time, only juvenile steelhead would be expected in the BSA.

If present, direct impacts to this species from temporary disturbances associated with the Project are anticipated due to fish relocation, creek dewatering, and a temporary increase in sediment mobilization. If juvenile steelhead are relocated out of the construction area prior to dewatering, relocation efforts could result in injury or mortality to pre-smolt juvenile steelhead; additionally, if juveniles escape capture, they may be adversely affected by dewatering activities. In the past, NMFS has estimated that fish rescue and dewatering activities in similar situations would result in mortality to less than 3 percent of individuals present (NMFS 2014). Additional direct impacts to steelhead include the temporary loss of suitable habitat during Project construction from dewatering of the Project site.

Direct impacts to steelhead habitat associated with Project activities include permanent and temporary impacts to the creek bed and banks including temporary disturbance to and/or temporary alteration of the creek channel from demolition and removal of the existing bridge, construction of the new bridge, and all associated Project activities (access to the creek bed, slope recontouring, RSP placement, and bank stabilization). Direct impacts are mostly temporary, short-term impacts that would be minimized or avoided by implementation of Project AMMs listed above and detailed in Section 1.3. Following construction, restoration of the creek's flow, bed, and banks to previous conditions and potentially improving habitat by increasing native riparian plantings would maintain or improve habitat conditions for steelhead.

Unavoidable indirect impacts to steelhead and habitat may include competition with other juveniles at relocation sites; increases in downstream turbidity during re-watering and during the first high flows following construction as a result of Project work on the banks and within the channel; changes to water temperature due to obstruction or alteration of flow and/or due to removal of thermal refugia, including shade and deep pools; disturbance to, or removal of, forage (such as macroinvertebrate communities in dewatered areas); removal of cover such as aquatic and emergent vegetation, boulders, and woody debris; and, disturbances to substrates. These indirect impacts are expected to be minor and temporary. Indirect impacts can be avoided or minimized with the

implementation of Project AMMs including construction BMPs to avoid pollution and minimize erosion, stockpiling native soils/gravels and materials to be replaced at the end of construction, restoration of the creek bed and banks to pre-existing conditions, and planting of native vegetation in disturbed areas.

Approximately 0.04 acre of permanent impacts will result from the placement of fill in steelhead habitat where RSP is installed below the OHWM. The widened bridge deck would increase permanent shading over San Geronimo Creek by approximately 131 square feet. Other potential permanent impacts to steelhead may include changes in water temperature due to removal of thermal refugia including shade and deep pools and removal of cover such as trees, boulders, and woody debris.

Approximately 0.12 acre of steelhead habitat would experience temporary impacts during construction. Temporary impacts include construction equipment access areas; the potential diversion of creek flow; disturbance to the creek bed and banks during removal of the old bridge and construction of the new bridge; temporary loss of habitat during Project construction (from dewatering); changes to water quality due to turbidity and sedimentation; changes to water temperature due to obstruction or alteration of flow and/or decreased shade from tree removal; disturbance to, or removal of, forage (such as macroinvertebrate communities in dewatered areas); removal of cover such as aquatic and emergent vegetation; and disturbances to substrates.

4.4.2.4. COMPENSATORY MITIGATION

The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge. RSP to be installed will prevent erosion and degradation of impacted areas. Additionally, specific AMMs detailed in Section 1.3, such as removal of invasive plants and restoration and revegetation of the creek bed and banks, will reduce potential effects to steelhead and improve species' habitat.

Coordination and consultation with NMFS will determine any further compensatory mitigation for this species.

4.4.2.5. CUMULATIVE IMPACTS

The resource study area for examining potential cumulative impacts to CCC DPS steelhead includes the CDFW's steelhead distribution layer within San Geronimo Creek and its tributaries, along with a one-mile buffer (CalFish 2007). Cumulative projects that would have an impact on steelhead include those that have both direct and

indirect impacts leading to an overall reduction in quantity, functionality, and longevity of steelhead habitat

Several past or planned future projects within or near the PCA had or have the potential to affect steelhead. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The amount and quality of habitat being impacted by the proposed Project will be mitigated through a combination of on-site enhancements and restoration, and off-site compensation as determined during the permitting process. Impacts from the proposed Project will not affect the persistence of local populations of steelhead in the San Geronimo Creek watershed. Impacts from the proposed projects within the resource study area are not anticipated to impact spawning habitat or create additional fish passage barriers. The County does not anticipate any unmitigated cumulative effects to CCC DPS steelhead as a result of the proposed Project.

4.4.3. California Red-legged Frog

The California red-legged frog (CRLF) was federally listed as a threatened species on May 23, 1996 (USFWS 1996b). Revised critical habitat for this species was designated by USFWS on March 17, 2010 (USFWS 2010b). It is also a California Species of Special Concern.

CRLF occur in California and Baja California from sea level to 5,000 feet. Within California, they have been recorded from Riverside County to Mendocino County along the Coast Range and from Calaveras County to Butte County in the Sierra Nevada. The species is common along parts of the central coast, but has been extirpated from most of the Sierra Nevada, northern coast, and northern Transverse ranges. The species is believed to have been extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (USFWS 2010b).

CRLF breed in ponds and slow-moving or still sections of streams. Ideal ponds have a mix of deep sections for escaping from predators and shallow sections which warm quickly and help the rearing of tadpoles and juveniles (USFWS 2002). Some emergent vegetation or shoreline vegetation such as cattails, bulrushes, or willows is also required for attachment of egg masses (USFWS 2002). Often adults will stay within the breeding habitat year-round if sufficient water is present, but some will move into adjacent uplands or other non-breeding aquatic habitat. Migrating individuals will

disperse from breeding sites in straight-line movements, without regard to vegetation or topography (Bulger et al. 2003, Fellers and Kleeman 2007). Radio tagged individuals have been found as far as 2 miles from suitable aquatic breeding habitat (USFWS 2002).

Introduced species such as bullfrogs (*Lithobates catesbeianus*), largemouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) may prey upon one or more life stages (eggs, tadpoles, or adults) of CRLF (Stebbins and McGinnis 2012).

4.4.3.1. SURVEY RESULTS

The BSA is within the historic and current range of CRLF (USFWS 2002). It is also within the boundary of the Pt. Reyes Peninsula Recovery Unit, based on the core area maps provided in the California Red-legged Frog Recovery Plan (USFWS 2002). The proposed Project is located outside of CRLF critical habitat, but critical habitat unit MRN-2 (Salmon Creek) is located approximately 3 miles northwest of the BSA (USFWS 2010b) (Appendix A: Figure 9). A review of the CNDDB indicated that there is one CNDDB occurrence of CRLF approximately 0.8 mile southwest of the BSA in the outflow of Kent Lake at the confluence with Lagunitas Creek (Appendix A: Figure 7). One adult was observed on May 17, 2006. The habitat consisted of a small man-made pond on an un-vegetated mudflat. The pond itself had cattails and overhanging willows on the south side. The next closest records are two stock ponds approximately 2 miles west on the west side of the Bolinas Ridge in the Olema Creek Valley, observed in 2006 and 2007. In total, there are 17 CNDDB records in the Olema Creek Valley within 5 miles of the BSA (Appendix A: Figure 8).

Even though migrating individuals will disperse from breeding sites in straight-line movements, without regard to vegetation or topography (Bulger et al. 2003, Fellers and Kleeman 2007), the Bolinas Ridge likely impedes dispersal from the Olema Creek Valley into the upper portion of the Lagunitas Creek watershed. Nevertheless, there already is a CNDDB record in Lagunitas Creek in close proximity to the BSA connected by a relatively undisturbed riparian corridor. This and the presence of suitable aquatic habitat within the BSA makes the species more likely to occur. CRLF may use the BSA as dispersal and foraging habitat.

For the reasons described above, the potential for CRLF to occur in the BSA is considered to be moderate.

4.4.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to CRLF during Project construction. Species-specific measures include preconstruction herpetofauna surveys (Measures #7 and #12), biological monitoring (Measure #13), creek bed and bank protection (Measure #19), aquatic riparian vegetation protection (Measure #20), fish and wildlife refugia protection (Measure #21), debris containment (Measure #22), prevention of wildlife entrapment (Measure #25), material storage (Measure #27), and restoration (Measure #30). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition or has been relocated to suitable habitat away from the construction area according to USFWS protocol and by an agency-approved biologist with a handling permit.

4.4.3.3. PROJECT IMPACTS

There are known CNDDB occurrences within the surrounding area and CRLF are known to use localities within two miles of suitable breeding habitat. Given the proximity of the CNDDB occurrences and the presence of vegetated habitat, the BSA has the potential to be used by CRLF. The species may also disperse through ruderal and barren areas, although it is less likely due to the lack of cover and suitable habitat.

As a result, direct effects to habitat for CRLF could occur. Approximately 0.14 acre of permanent impacts will result from the placement of fill in CRLF habitat where the new bridge abutments are installed and where RSP is installed below the OHWM. Approximately 0.42 acre of CRLF habitat would experience temporary impacts during construction. Figure 12 in Appendix A demonstrates the Project impacts by land cover type. The barren road shoulder areas within the BSA were not included in this calculation because these areas do not provide habitat for the species. Additionally, the barren road shoulder areas will remain barren, or will be revegetated maintaining the current dispersal characteristics for the species. The County does not anticipate any effects to breeding habitat; due to the constant flow of San Geronimo Creek and the lack of still pools in the waters present in the BSA, there is no suitable breeding habitat within the BSA. The work will be conducted during the dry season, when adult CRLF are not expected to be dispersing through the BSA.

Direct effects to individual CRLF may occur throughout the PCA as a result of construction activities, including site preparation, use of heavy equipment, placement of new permanent structures and the placement of temporary and permanent fills within dispersal and foraging habitat. Activities during construction could result in injury or

death to the species in the construction area during these activities. All efforts to minimize direct effects will be made with the implementation of AMMs. There is a low potential for direct mortality of individuals due to excavation and grading activities with heavy equipment, due to the cryptic nature of the species. Indirect impacts may result from habitat exclusion, and construction activities could include water quality degradation from erosion or sediment loading. The water quality impacts are unlikely, given the proposed AMMs and Caltrans BMPs.

4.4.3.4. COMPENSATORY MITIGATION

The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge. RSP to be installed will prevent erosion and degradation of impacted areas. The installation of wildlife exclusion fencing is intended to prevent the species from accessing the PCA, which should prevent direct take through mortality. All temporarily impacted areas will be re-seeded with native species appropriate to the site. The County believes the AMMs outlined in Section 1.3 will reduce potential effects to CRLF.

Coordination and consultation with USFWS will determine any further compensatory mitigation for this species.

4.4.3.5. CUMULATIVE IMPACTS

The resource study area for examining potential cumulative impacts to CRLF was defined as 2.3-mile radius around the BSA, which corresponds to the known dispersal distance.

Several past or planned future projects within or near the PCA had or have the potential to affect CRLF. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. San Geronimo Creek provides only aquatic dispersal habitat for the species within the BSA. The County did not identify any suitable breeding habitat within the Project limits. The amount and quality of habitat being impacted by the proposed Project will be mitigated through a combination of on-site enhancements and restoration, and off-site compensation as determined during the Section 7 Consultation process. Impacts from the proposed Project will not affect the persistence of local populations of CRLF in the San Geronimo Creek watershed. Impacts from the projects within the resource study area discussed above are not anticipated to impact breeding habitat or create additional

wildlife barriers. The County does not anticipate any unmitigated cumulative effects to CRLF as a result of the proposed Project.

4.4.4. Foothill Yellow-legged Frog

The foothill yellow-legged frog (FYLF) is a California Species of Special Concern (California Fish and Game Commission 2020). The historic range of the FYLF extended along most of the permanent streams and creeks in the Coast Ranges from southern Oregon to the San Gabriel River in Los Angeles County as well as along the foothills of the Cascades, Sierra Nevada, and Tehachapi Mountains (Stebbins and McGinnis 2012). Isolated populations were also known from the mountains of Los Angeles County. Currently, the species occurs in the Coast Ranges from Oregon to the San Gabriel River in Los Angeles County and along the western slopes of the Sierra/Cascade crest in most of central and northern California (Jennings and Hayes 1994). The elevational range of FYLF in California extends from sea level and have been recorded in the Sierra Nevada as high as 6,000 feet (Stebbins 2003).

FYLF are a highly aquatic amphibian, spending most or all of their life in or near streams, but they have also been documented underground and beneath surface objects more than 50 meters from water (Nussbaum et al. 1983). Their habitat consists of flowing perennial waterways such as streams, creeks, and smaller rivers with partial shade, shallow riffles, and cobble-sized or greater substrate (Hayes and Jennings 1988). Adult FYLF are primarily diurnal with strong site fidelity and typically occupy small home ranges. However, from April through June, adults and juveniles may move several hundred meters or more to congregate at breeding sites. Breeding occurs in areas of shallow, slow-moving water with pebble and cobble substrate usually between March and June. Egg masses are laid in compact clusters containing 300 to 1,200 eggs attached to cobbles and boulders at the sides of streams in lower than ambient flow velocities (Kupferberg 1996). In Northern California, most breeding sites are used repeatedly (Kupferberg 1996). Egg masses hatch within one to four weeks, depending on water temperature, and tadpoles transform in three to four months. The species may be active all year in the warmest localities, but may become inactive or hibernate in colder areas.

FYLF have disappeared from an estimated 66 percent of their former range (Stebbins 2003). Non-native predators, land use conversion, pesticide use, and modification of hydrology are considered the main threats to FYLF populations (Jennings and Hayes 1994). FYLF have been recorded at several locations within a 5-mile radius of the BSA.

4.4.4.1. SURVEY RESULTS

The nearest occurrences of FYLF are within the BSA and include two records from California Academy of Science (CAS). These records are located on San Geronimo Creek, approximately 0.13 miles downstream (Appendix A: Figure 7) of the Mountain View Bridge, and were collected in 1911 (CAS 27319) and 1928 (CAS 63664-63721) (GANDA 2010). The third nearest occurrence to the BSA is a CNDDB record approximately 0.75 miles downstream on Lagunitas Creek, just downstream of Peters Dam; this is also a historic occurrence from 1956. No more recent observations have been reported to the CNDDB for either of these creeks. Since approximately 1997, MMWD fisheries biologists have conducted surveys in the Lagunitas Creek watershed and have not detected FYLF in Lagunitas Creek or San Geronimo Creek (Eric Ettlinger, personal communication to GANDA Biologist Karla Marlow, 5-14-2019). The nearest known stable population of FYLF occurs approximately 2.3 miles southeast of the BSA in Big Carson Creek. Surveys conducted for MMWD by GANDA biologists in every season between 2004 and 2018 have documented FYLF breeding each year and recorded hundreds of adult and juvenile FYLF at Big Carson Creek and two unnamed tributaries (GANDA 2018). The confluence of Big Carson Creek with Kent Lake is approximately 2.2 miles from the BSA and separated by a large MMWD water supply dam.

The BSA is within the historic range of FYLF, though the species has not been found in Lagunitas or San Geronimo creeks since MMWD started regular spawning surveys in the watershed. While MMWD has conducted extensive fish surveys within these creeks for years without FYLF detections (GANDA 2012), FYLF egg masses, adults and juveniles were recently recorded in San Anselmo Creek and two associated tributaries (GANDA 2018 and 2019 unpublished data), which have also been regularly surveyed for fish in previous years without any detections of FYLF. Based on this information, historic records near the BSA, and the presence of suitable FYLF breeding, dispersal, and foraging habitat in San Geronimo Creek, there remains a high potential for FYLF to occur within the BSA.

4.4.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to FYLF during Project construction. Species-specific measures include preconstruction herpetofauna surveys (Measure #7), biological monitoring (Measure #13), creek bed and bank protection (Measure #19), aquatic riparian vegetation protection (Measure #20), fish and wildlife refugia protection (Measure #21), debris containment (Measure #22),

prevention of wildlife entrapment (Measure #25), material storage (Measure #27), and restoration (Measure #30). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition or has been relocated to suitable habitat away from the construction area by a qualified biologist using proper amphibian handling methods.

4.4.4.3. PROJECT IMPACTS

There are known CNDDB and MMWD occurrences within the surrounding area and FYLF are known to disperse significant distances to and from breeding sites, with 4.3 miles as the largest recorded distance (USDA 2016). Given the proximity of the occurrences and the presence of vegetated habitat, the BSA has the potential to be used by FYLF. The species may also disperse through ruderal and barren areas, although it is less likely due to the lack of cover and suitable habitat.

As a result, direct effects to habitat for FYLF could occur. Approximately 0.14 acre of permanent impacts will result from the placement of fill in FYLF habitat where the new bridge abutments are installed and where RSP is installed below the OHWM. Approximately 0.42 acre of FYLF habitat would experience temporary impacts during construction. Figure 12 demonstrates the Project impacts by land cover type. The barren road shoulder areas within the BSA were not included in this calculation because these areas do not provide habitat for the species. Additionally, the barren road shoulder areas will remain barren, or will be revegetated maintaining the current dispersal characteristics for the species. The County does not anticipate any effects to breeding habitat. The work will be conducted during the dry season, when adult FYLF are not expected to be dispersing through the BSA. Thorough preconstruction surveys of the work area will also be conducted prior to dewatering to ensure that no breeding is taking place.

Direct effects to individual FYLF may occur throughout the PCA as a result of construction activities, including site preparation, use of heavy equipment, placement of new permanent structures and the placement of temporary and permanent fills within dispersal, foraging, and breeding habitat. Activities during construction could result in injury or death to the species in the construction area during these activities. All efforts to minimize direct effects will be made with the implementation of AMMs. There is a low potential for direct mortality of individuals due to construction activities. Indirect impacts may result from habitat exclusion, and construction activities could include

water quality degradation from erosion or sediment loading. The water quality impacts are unlikely, given the proposed AMMs and Caltrans BMPs.

4.4.4.4. COMPENSATORY MITIGATION

The FYLF is not protected under any regulation that would require compensatory mitigation.

4.4.4.5. CUMULATIVE IMPACTS

Several past or planned future projects within or near the PCA had or have the potential to affect FYLF. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. San Geronimo Creek provides aquatic dispersal, foraging, and breeding habitat for the species within the BSA. The amount and quality of habitat being impacted by the proposed Project will be mitigated through a combination of on-site enhancements and restoration, and off-site compensation as determined during the permitting process. Impacts from the proposed Project will not affect the persistence of local populations of FYLF in the San Geronimo Creek watershed. Impacts from the projects within the resource study area discussed above are not anticipated to substantially impact breeding habitat or create additional wildlife barriers. The County does not anticipate any unmitigated cumulative effects to FYLF as a result of the proposed Project.

4.4.5. Tomales Roach

Tomales roach (*Lavinia symmetricus* ssp. *2*) is a California Species of Special Concern (CDFW 2018). It is a subspecies of California roach endemic to the tributaries of Tomales Bay. California roach occur in a variety of mid- and low- elevation habitats throughout central and coastal California. The taxonomy of California roach is evolutionarily complex and dynamic, and currently includes eight subspecies, although these designations may change as further investigations tease out the taxonomy of the species.

Roach occur in a wide variety of habitats from cool headwater reaches to the warmer lower reaches. They are often found in lower gradient reaches with slow to moderate flows and complex instream cover (e.g., woody debris and submerged vegetation). Roach are tolerant of relatively high water temperatures (30-35 degrees Celsius) and low oxygen (Moyle 2002). Roach are omnivorous, foraging on a mixture of algae and

invertebrates. Spawning occurs in March to early July and roach breed in gravel beds or riffles.

4.4.5.1. SURVEY RESULTS

Tomales roach are known to occur in the tributaries of Tomales Bay, including the Lagunitas Creek watershed (Appendix A: Figure 7). Two CNDDB occurrences of the Tomales roach were recorded within 5 miles from the BSA. The most recent, from 2003, was recorded about 1.3 miles northwest of the BSA and 1.2 miles northeast of the confluence to San Geronimo Creek. The second occurrence from 1999 was recorded in Olema Creek about 3.2 miles southwest of the BSA. Tomales roach were also observed in San Geronimo Creek within the BSA during the May 4, 2015 site visit. The species was observed during the field survey, which is consistent with distribution data, so Tomales roach is considered to have high potential to occur in the BSA.

4.4.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to Tomales roach during Project construction. Species-specific measures include work period (Measure #4), preconstruction surveys (Measure #7), biological monitoring (Measure #13), water diversion and dewatering (Measure #16), creek bed and bank protection (Measure #19), fish and wildlife refugia protection (Measure #21), debris containment (Measure #22), and restoration (Measure #30). If an individual is found during preconstruction surveys, work will not commence until a qualified biologist relocates the individual outside of the work area.

4.4.5.3. PROJECT IMPACTS

Tomales roach have a high potential to occur within the BSA throughout the year.

If present, direct impacts to this species from temporary disturbances associated with the Project are anticipated due to fish relocation, creek dewatering, and a temporary increase in sediment mobilization. If roach are relocated out of the construction area prior to dewatering, relocation efforts could result in injury or mortality; additionally, if roach escape capture, they may be adversely affected by dewatering activities. Additional direct impacts to roach include the temporary loss of suitable habitat during Project construction from dewatering of the Project site.

Direct impacts to roach habitat associated with Project activities include permanent and temporary impacts to the creek bed and banks including temporary disturbance to and/or temporary alteration of the creek channel from demolition and removal of the

existing bridge, construction of the new bridge, and all associated Project activities (access to the creek bed, slope recontouring, RSP placement, and bank stabilization). Direct impacts are mostly temporary, short-term impacts that would be minimized or avoided by implementation of Project AMMs listed below and detailed in Section 1.3. Following construction, restoration of the creek's flow, bed, and banks to previous conditions and potentially improving habitat by increasing native riparian plantings would maintain or improve habitat conditions for roach.

Unavoidable indirect impacts to roach and habitat may include competition with other fish at relocation sites; increases in downstream turbidity during re-watering and during the first high flows following construction as a result of Project work on the banks and within the channel; changes to water temperature due to obstruction or alteration of flow and/or due to removal of thermal refugia, including shade and deep pools; disturbance to, or removal of, forage (such as macroinvertebrate communities in dewatered areas); removal of cover such as aquatic and emergent vegetation, boulders, and woody debris; and, disturbances to substrates. These indirect impacts are expected to be minor and temporary. Indirect impacts can be avoided or minimized with the implementation of Project AMMs including construction BMPs to avoid pollution and minimize erosion, stockpiling native soils/gravels and materials to be replaced at the end of construction, restoration of the creek bed and banks to pre-existing conditions, and planting of native vegetation in disturbed areas.

Approximately 0.04 acre of permanent impacts will result from the placement of fill in Tomales roach habitat where RSP is installed below the OHWM. The widened bridge deck would increase permanent shading over San Geronimo Creek by approximately 131 square feet. Other potential permanent impacts to roach may include changes in water temperature due to removal of thermal refugia including shade and deep pools and removal of cover such as trees, boulders, and woody debris.

Approximately 0.12 acre of roach habitat would experience temporary impacts during construction. Temporary impacts include construction equipment access areas; the potential diversion of creek flow; disturbance to the creek bed and banks during removal of the old bridge and construction of the new bridge; temporary loss of habitat during Project construction (from dewatering); changes to water quality due to turbidity and sedimentation; changes to water temperature due to obstruction or alteration of flow and/or decreased shade from tree removal; disturbance to, or removal of, forage

(such as macroinvertebrate communities in dewatered areas); removal of cover such as aquatic and emergent vegetation; and disturbances to substrates

4.4.5.4. COMPENSATORY MITIGATION

Tomales roach is not protected under any regulation that would require compensatory mitigation.

4.4.5.5. CUMULATIVE IMPACTS

The resource study area for examining potential cumulative impacts to Tomales roach includes San Geronimo Creek and its tributaries, along with a one-mile buffer (CalFish 2007). Cumulative projects that would have an impact on Tomales roach include those that have both direct and indirect impacts leading to an overall reduction in quantity, functionality, and longevity of roach habitat.

Several past or planned future projects within or near the PCA had or have the potential to affect Tomales roach. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The amount and quality of habitat being impacted by the proposed Project will be mitigated through a combination of on-site enhancements and restoration. Impacts from the proposed Project will not affect the persistence of local populations of Tomales roach in the San Geronimo Creek watershed. Impacts from the proposed projects within the resource study area are not anticipated to substantially impact breeding habitat or create additional wildlife barriers. The County does not anticipate any unmitigated cumulative effects to Tomales roach as a result of the proposed Project.

4.4.6. California Freshwater Shrimp

California freshwater shrimp (*Syncaris pacifica*) are endemic to the lower reaches of perennial streams in Marin, Napa, and Sonoma counties. Freshwater shrimp are typically found in low elevation (less than 116 meters) and low gradient (less than 1% slope) habitats with structurally diverse banks (USFWS 1998). Optimal habitats are slow-moving, 30–90 centimeters deep, with undercut banks, exposed roots extending into the water, large and small woody debris to slow water and encourage and deposition of organic detritus, and vegetation in the water. California freshwater shrimp typically breed in the fall, and the females carry eggs through the winter, which then hatch in May and June. California freshwater shrimp may mature after their second summer, and may live more than three years (USFWS 1998).

4.4.6.1. SURVEY RESULTS

The historic range of California freshwater shrimp is unknown. California freshwater shrimp used to occur near Shafter Bridge in Lagunitas Creek (Appendix A: Figure 7 and 8). Currently, the upstream limit appears to be near the confluence with Devils Gulch, which is on Lagunitas Creek approximately 2.7 miles below the confluence of San Geronimo Creek. The shrimp has not been found in San Geronimo Creek and the species is expected to occur downstream of Lagunitas (Larry Serpa, Nature Conservancy, personal communication to GANDA Fisheries Biologist Rob Aramayo, 2015). The proposed bridge replacement is approximately 3.5 miles upstream from the confluence with Devils Gulch. One CNDDB occurrence of freshwater shrimp in Lagunitas Creek was recorded approximately 2.5 miles from the BSA in 1999.

For the reasons described above, the potential for California freshwater shrimp to occur in the BSA is considered to be low.

4.4.6.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for effects to California freshwater shrimp during Project construction. Species-specific measures include preconstruction surveys (Measure #7) and biological monitoring (Measure #13). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition.

4.4.6.3. PROJECT IMPACTS

The activity most likely to have direct impacts on this species is the installation and removal of the temporary diversion of San Geronimo Creek. Project construction will take place outside of the species' breeding season. In the event that adult shrimp are located during preconstruction surveys or Project activities, work will not start until the individual has left the Project area. With implementation of the proposed AMMs, listed above and detailed in Section 1.3, including construction BMPs to avoid pollution, minimize erosion, and restore the creek channel and banks to pre-existing conditions, as well as surveys and protection efforts by a qualified biologist, only minor impacts from temporary disturbance and potential relocation are anticipated to this species, should it occur.

4.4.6.4. COMPENSATORY MITIGATION

Impacts to California freshwater shrimp from the Project are anticipated to be minor and would be minimized further by the proposed Project AMMs, therefore compensatory mitigation is not proposed.

4.4.6.5. CUMULATIVE IMPACTS

Several past or planned future projects within or near the PCA had or have the potential to affect California freshwater shrimp. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The amount and quality of habitat being impacted by the proposed Project will be mitigated through a combination of on-site enhancements and restoration. Impacts from the proposed Project will not affect the persistence of local populations of California freshwater shrimp in the San Geronimo Creek watershed. Impacts from the proposed projects within the resource study area are not anticipated to substantially impact breeding habitat or create additional wildlife barriers. The County does not anticipate any unmitigated cumulative effects to California freshwater shrimp as a result of the proposed Project.

4.4.7. California Giant Salamander

California giant salamander (*Dicamptodon ensatus*) is a California Species of Special Concern. California giant salamanders inhabit moist forests near cold, clear streams or seepage areas (sometimes mountain lakes) from Mendocino County south to Monterey County and east to Napa County. Adults use rocks and logs for refugia when away from water. Breeding typically occurs in spring and later in the year at higher elevations; eggs are deposited in a hidden, water-filled nest chamber, often beneath logs, rocks, or in crevices within stream habitat; females will remain with their eggs and guard them until they hatch six or seven months after oviposition (Nafis 2017). The larval stage is aquatic and found in cold, clear streams (sometimes also in ponds and lakes) and, depending on environmental conditions, will typically transform to terrestrial form in 18-24 months after hatching (Nafis 2017).

4.4.7.1. SURVEY RESULTS

The nearest occurrence of California giant salamander to the BSA includes a historic record from California Academy of Science (CAS). This record is located approximately 0.13 miles downstream (Appendix A: Figure 7) of the Mountain View Bridge on San Geronimo Creek, and the specimen was collected along with FYLF specimens in 1928 (CAS 63664-63721) (GANDA 2010). The second nearest occurrence (#163) of the California giant salamander is approximately 0.73 miles southeast of the BSA and was recorded in 2012 (Appendix A: Figure 7). During FYLF surveys conducted for MMWD between 2008 and 2018, GANDA biologists have documented the presence of larvae and adult *Dicamptodon ensatus* in several tributaries

associated with Kent Lake, including Little Carson and Big Carson creeks, San Anselmo Creek, Cascade Creek, Cataract Creek, and several unnamed tributaries (GANDA 2010).

The BSA is within the historic range of the California giant salamander and there is suitable habitat within San Geronimo Creek and one associated unnamed tributary. Based on suitable habitat, historic and recent CNDDB records nearby, and the detections in most of the tributaries associated with Kent Lake, there is a high potential for *Dicamptodon ensatus* to occur within the BSA.

4.4.7.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to California giant salamander during Project construction. Species-specific measures include preconstruction herpetofauna surveys (Measure #7), biological monitoring (Measure #13), creek bed and bank protection (Measure #19), aquatic riparian vegetation protection (Measure #20), fish and wildlife refugia protection (Measure #21), debris containment (Measure #22), prevention of wildlife entrapment (Measure #25), material storage (Measure #27), and restoration (Measure #30). If an individual is found during preconstruction surveys, work will not commence until a qualified biologist relocates the individual outside of the work area.

4.4.7.3. PROJECT IMPACTS

The activity most likely to have direct impacts on this species is the installation and removal of the temporary diversion of San Geronimo Creek. As larval and adult salamanders are mobile, and breeding is not anticipated in the BSA, it is anticipated that any salamanders in the impact area will move away from the Project activities. In the event that larval or adult salamanders are located during preconstruction surveys or Project activities, they would be documented and relocated. With implementation of the proposed AMMs, listed above and detailed in Section 1.3, including construction BMPs to avoid pollution, minimize erosion, and restore the creek channel and banks to pre-existing conditions, as well as surveys and protection efforts by a qualified biologist, only minor impacts from temporary disturbance and potential relocation are anticipated to this species, should it occur.

4.4.7.4. COMPENSATORY MITIGATION

The Project is not expected to impact California giant salamander, and the salamander is not protected under any regulation that would require compensatory mitigation.

4.4.7.5. CUMULATIVE IMPACTS

Several past or planned future projects within or near the PCA had or have the potential to affect California giant salamander. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. No impacts to salamander by the proposed Project are expected. The County does not anticipate any unmitigated cumulative effects to California giant salamander as a result of the proposed Project.

4.4.8. Western Pond Turtle

The western pond turtle is a California Species of Special Concern. Western pond turtles range throughout California, from southern coastal California and the Central Valley, north to the Cascade and eastern Sierra Nevada mountain ranges. Western pond turtles occur in a variety of permanent and intermittent aquatic habitats, such as ponds, marshes, rivers, streams, and ephemeral pools. They require slack or slow water habitat for feeding as well as suitable dry habitat such as rocks or fallen logs for basking and hauling out. In addition to appropriate aquatic habitat, these turtles require an upland nesting site in the vicinity of the aquatic habitat, often within 656 feet. Nests are typically dug in grassy, open fields with soils that are high in clay or silt. Egg-laying usually takes place between March and August (Jennings and Hayes 1994).

4.4.8.1. SURVEY RESULTS

The only CNDDB occurrence of western pond turtle within 5 miles is an undated museum specimen whose locality is listed as “Nicasio”. This is mapped in the CNDDB to an area with a one-mile error radius approximately 2.3 miles north of BSA. No western pond turtles were detected during the field survey.

Habitat within the BSA is only marginally suitable for western pond turtles. The dense shading of the riparian corridor severely limits the amount of available basking habitat, which is necessary for this species to persist. Similarly, the thermal characteristics of the streambanks are not suitable for nesting due to shading from dense riparian vegetation, and there is therefore no nesting habitat within the BSA. However, western pond turtles may occasionally use San Geronimo Creek to disperse between other areas of more suitable habitat.

For the reasons described above, the potential for western pond turtles to occur in the BSA is considered to be moderate.

4.4.8.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to western pond turtle during Project construction. Species-specific measures include preconstruction surveys (Measure #6), biological monitoring (Measure #12), creek bed and bank protection (Measure #17), aquatic riparian vegetation protection (Measure #18), fish and wildlife refugia protection (Measure #19), debris containment (Measure #20), and restoration (Measure #28). If an individual is found during preconstruction surveys, work will not commence until a qualified biologist relocates the individual outside of the work area.

4.4.8.3. PROJECT IMPACTS

The activity most likely to have direct impacts on this species is the temporary diversion of San Geronimo Creek. As western pond turtles are mobile, and nesting is not anticipated in the BSA, it is expected that any pond turtles in the impact area will move away from the Project activities. With implementation of proposed AMMs, listed above and detailed in Section 1.3, including construction BMPs to avoid pollution, minimize erosion, and restore the creek channel and banks to pre-existing conditions, as well as surveys and protection efforts by a qualified biologist, only minor impacts from temporary disturbance and potential relocation are anticipated to this species, should it occur.

4.4.8.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed for the western pond turtle. No adverse impacts to this species are anticipated. Implementation of the general AMMs will serve as a means to offset any potential impacts to the species.

4.4.8.5. CUMULATIVE IMPACTS

Western pond turtles nest up to 1,500 feet from water (Holland 1994), but movements within a stream drainage are highly variable and can exceed 2.5 kilometers (1.6 miles; Holland 1994). Therefore, the resource study area for this analysis is a 1.6-mile buffer around the BSA. Several past or planned future projects within or near the PCA had or have the potential to affect western pond turtle. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The impacts to western pond turtle by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to western pond turtle as a result of the proposed Project.

4.4.9. Northern Spotted Owl

Northern spotted owl was listed as a federally threatened species in 1990 (USFWS 1990). They inhabit forested regions from southern British Columbia through Washington, Oregon, and northwestern California. Marin County is the southern limit of their range (Ellis et al. 2013). In the majority of their range, they are found in mature coniferous forest, but inhabit second growth and old growth Douglas fir (*Pseudotsuga menziesii*), coast redwood, bishop pine (*Pinus muricate*), mixed conifer-hardwood, and evergreen hardwood forests in Marin County (Ellis et al. 2013).

They prefer nest site locations lower in the watershed, closer to streams, with more south-facing slope aspects (Stralberg et al. 2009). Most spotted owls in Marin County nest in platform structures such as tree forks, large limbs, broken top trees with lateral branches, old raptor, corvid, squirrel, and woodrat nests, debris piles, poison oak tangles and dwarf mistletoe infestations. Nests have been documented in coast redwood, Douglas fir, bishop pine, California bay, tanoak (*Lithocarpus densiflorus*) and coast live oak (*Quercus agrifolia*) (Ellis et al. 2013).

The primary prey base for owls in Marin County is dusky-footed woodrats. This dependence on woodrats is thought to explain the high densities and fecundity rates found in the Marin owl population. More than 80 pairs have been found in Marin County at over 100 different locations. Other prey species in Marin County include deer mouse (*Peromyscus maniculatus*), California meadow vole (*Microtus californicus*), brush rabbit (*Sylvilagus bachmani*) and a variety of forest-dwelling birds (Fehring 2003 as cited in Ellis et al. 2013).

The CDFW maintains a separate database from the CNDDB for spotted owls, referred to as the Spotted Owl Observations Database. The database differs slightly from the CNDDB in that it tracks Activity Centers and observations associated with activity centers. Spotted owls have been characterized as central-place foragers, where individuals forage over a wide area and subsequently return to a nest or roost location that is often centrally located within the home range (Rosenberg and McKelvey 1999). Activity Centers are a location or point within the core use area that represent this central location. Nest sites are typically used to identify Activity Centers, or in cases where nests have not been identified, breeding season roost sites or areas of concentrated nighttime detections may be used to identify Activity Centers (USFWS 2011).

4.4.9.1. SURVEY RESULTS

The BSA is a quarter of a mile north of critical habitat unit 3 (Redwood Coast) subunit RDC–5 (USFWS 2012a) (Appendix A: Figure 9). In addition, there is an Activity Center approximately 450 feet southwest of the BSA (Spotted Owl Observations Database: CDFW 2019c) (Figure 10). Information associated with the Activity Center says that the nest was last checked in 2007, but there is a spotted owl observation associated with the Activity Center from April 28, 2011. It is unknown whether or not this is still an occupied nest site, however, given the density of owls in the area, it is likely occupied.

The BSA does not contain suitable nesting habitat, but it is in the immediate vicinity (450 feet) of known nesting and foraging habitat (Appendix A: Figure 10). Spotted owls in the vicinity of the Project site could potentially be disturbed (i.e. harassed) due to noise from construction activities.

For the reasons described above, the potential for northern spotted owls to occur in the BSA is considered to be high.

4.4.9.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to northern spotted owl during Project construction. Species-specific measures include work window (Measure #5), preconstruction nesting bird surveys (Measure #9), non-disturbance buffer for nesting birds (Measure #10), and biological monitoring (Measure #13). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition.

4.4.9.3. PROJECT IMPACTS

No impacts to nesting spotted owls are expected to occur as a result of the Project because the owls are not expected to nest close enough to the BSA to be disturbed by construction; roosting owls could be temporarily displaced by construction activities. The proposed AMMs, listed above and detailed in Section 1.3, are designed to avoid these impacts if a spotted owl is found within or adjacent to the BSA. Therefore, with the implementation of these measures, no impacts are anticipated to northern spotted owls.

4.4.9.4. COMPENSATORY MITIGATION

The Project is not expected to impact northern spotted owls, therefore compensatory mitigation is not proposed.

4.4.9.5. CUMULATIVE IMPACTS

Several past or planned future projects within or near the PCA had or have the potential to affect northern spotted owl. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. The impacts to northern spotted owl by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to northern spotted owl as a result of the proposed Project.

4.4.10. Marbled Murrelet

Marbled murrelet is listed as a federally threatened and a California endangered species (USFWS 1992). A small diving seabird, it primarily forages in near-shore marine waters on small schooling fish and invertebrates (Bent 1963). It spends the majority of its time on the ocean, roosting and feeding, but comes inland up to 50 miles to nest in dense, shady, old growth forests with large trees with suitable nesting substrate (CDFW 1994). Nesting substrate consists of large, horizontal, moss-covered limbs of old Douglas-fir. It is critical that the nest be located on a vegetated branch of a conifer with an open crown that can provide easy access for adults and a clear flight path for juveniles (Carter and Erickson 1988). The nest is located near or next to the trunk on a wide horizontal branch that is covered with moss, usually projecting southward, and typically protected by a slanting trunk and closely overhanging branch (Bindford et al. 1975).

Murrelets nest in stands varying in size from several acres to thousands of acres; however, larger unfragmented stands of old growth appear to be the highest quality habitat for nesting. The known nesting areas in California stretch from Half Moon Bay to Santa Cruz, and from Eureka to the Oregon Border. After extensive surveys in ideal habitat areas in Marin County, such as Muir Woods National Monument, no individuals have been found (Gardali and Geupel 2000).

4.4.10.1. SURVEY RESULTS

This species is not known to occur in Marin County despite extensive surveys conducted in ideal habitat areas (Gardali and Geupel 2000). Nevertheless, federal Critical Habitat unit CA-09-b is located approximately a quarter of a mile west of the BSA (USFWS 1996c) (Figure 9). The importance of this Critical Habitat unit is to allow for potential future reconnection of marbled murrelet populations in northern and central California, but is not currently occupied (USFWS 1997). Critical Habitat unit

CA-09-b is not currently occupied, it is located outside of the BSA and the BSA does not contain suitable habitat for marbled murrelets.

For the reasons described above, there is no potential for marbled murrelets to occur in the BSA. This project will have no effect on marbled murrelets or marbled murrelet Critical Habitat.

4.4.10.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for effects to marbled murrelet during Project construction. Species-specific measures include preconstruction surveys (Measure #6) and biological monitoring (Measure #13). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition.

4.4.10.3. PROJECT IMPACTS

Adverse impacts to marbled murrelet are not expected from this Project.

4.4.10.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed for the marbled murrelet. No adverse impacts are anticipated to occur to this threatened species. Implementation of the general AMMs will serve as a means to offset any potential impacts to the species.

4.4.10.5. CUMULATIVE IMPACTS

Several past or planned future projects within or near the PCA had or have the potential to affect marbled murrelet. A brief summary of the known projects is provided in Section 4.1.1.5. All of these projects went through, or are required to undergo, an environmental review to identify, account for, and mitigate potential adverse impacts. No impacts to marbled murrelet by the proposed Project are expected. The County does not anticipate any unmitigated cumulative effects to marbled murrelet as a result of the proposed Project.

4.4.11. San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat is a California Species of Special Concern and is locally common in undisturbed portions of habitat throughout its range. This subspecies occurs in the southern half of the Bay Area (south of Golden Gate through the Santa Cruz Mountains to the Pajaro River and in the East Bay, south of the Suisun Bay along the western slope of the Diablo Range). As a unique subspecies, this designation was confirmed by genetic studies based on mitochondrial DNA (Matocq

2002), although the range may extend slightly farther south along the inner coast range. Woodrats feed mostly on woody plants such as coast live oak, other oaks, bigleaf maple, coffeeberry (*Rhamnus crocea*), alder (*Alnus* spp.), elderberry (*Sambucus* spp.), toyon (*Heteromeles arbutifolia*), and poison oak (Johnston and Cezniak 2004). Woodrats are active mainly at night, when they venture out to collect food (Carraway and Verts 1991). A nocturnal lifestyle allows them to avoid high daytime temperatures and predators. They build large stick nests referred to as "houses" that are typically made of twigs and leaves at the base of a tree, within a set of large logs or tree branches, or in a shrub such as poison oak or toyon. Some houses are constructed off the ground in the lower branches of large trees, typically live or blue oak (*Quercus douglasii*). Houses are usually built under the canopy of trees and the abundance of houses may be limited by the availability of house-building materials (Bryiski et al. 1990). Dusky-footed woodrats live in loosely-cooperative societies and have a matrilineal (mother-offspring associations; through the maternal line) social structure (Kelly 1990). Females generally remain close to their birth den, while males disperse away from their birth den and are highly territorial and aggressive, especially during the breeding season. Woodrats have a maximum dispersal range of one mile (Smith 1965). The breeding season of dusky-footed woodrats can extend from February through November (Vestal 1938).

4.4.11.1. SURVEY RESULTS

The BSA, which includes riparian habitat, serves as prime habitat for the woodrat. During time of survey, no active woodrat houses were observed in the BSA. Disturbance from road and other human activity due to adjacent residential development may deter woodrat from heavily occupying the Project area. Though no CNDDB occurrences were found within 5 miles of the BSA, the species is generally known to occur in the region, with occurrences often not recorded. Based on the presence of favorable habitat and frequency of occurrence in surrounding areas, the woodrat is considered to have a moderate potential to occur within the BSA.

4.4.11.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for effects to San Francisco dusky-footed woodrat during Project construction. Species-specific measures include preconstruction surveys (Measure #7), biological monitoring (Measure #13), and worker environmental awareness training (Measure #14). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition.

4.4.11.3. PROJECT IMPACTS

The riparian area within the BSA provides suitable habitat for woodrats. Middens located in permanent impact areas will have to be removed and/or relocated. If any middens are located in the zone of temporary impact, they may not need to be removed depending on the type of Project activities that will occur, but construction could disturb the woodrats enough to cause midden abandonment. Woodrat middens located within or adjacent to temporary impact areas may be moved in consultation with CDFW.

4.4.11.4. COMPENSATORY MITIGATION

The San Francisco dusky-footed woodrat is not protected under any regulation that would require compensatory mitigation. However, County will request a Memorandum of Understanding (MOU) with CDFW to develop and implement a relocation plan for woodrat houses that will be affected by the proposed Project.

4.4.11.5. CUMULATIVE IMPACTS

Woodrats have a maximum dispersal range of one mile (Smith 1965). Using a one-mile buffer around the BSA as a resource study area. The amount and quality of San Francisco dusky-footed woodrat habitat being impacted by the Proposed project is minimal, the impacts from the Project would be off-set through on-site restoration and enhancement activities and a woodrat house relocation plan. Impacts from the proposed Project are not anticipated to affect the persistence of local population of San Francisco dusky-footed woodrat in the resource study area. The County does not anticipate any cumulative effects to San Francisco dusky-footed woodrat as a result of the proposed Project.

4.4.12. Migratory Bird Species

Under the federal Migratory Bird Treaty Act (MBTA) and California FGC Sections 3505, 3513, and 3800, migratory birds, their nests, and eggs are protected from disturbance or destruction. Removal or disturbance of active nests would be in violation of these regulations. All birds are protected under the MBTA and FGC except for two non-native species, the European starling (*Sturnus vulgaris*) and the house sparrow (*Passer domesticus*).

4.4.12.1. SURVEY RESULTS

Migratory bird species may nest anywhere within the BSA except for paved road surfaces and the active channel of San Geronimo Creek. Riparian areas like those found

within the BSA are particularly attractive for nesting birds and provide nesting habitat for numerous species.

During the reconnaissance survey, two mud nests were observed on the underside of the bridge which appeared to have been built by black phoebes (*Sayornis nigricans*), a common bird that frequently nests on bridges. Neither of the nests were active at the time of the reconnaissance survey, indicating that they may have been left from a previous year. Other common bird species covered by the MBTA such as house finch (*Haemorhous mexicanus*) and barn swallow (*Hirundo rustica*) may also nest on the bridge.

In addition to common bird species, several special-status birds have at least some potential to nest and/or forage within the BSA, including those listed below:

- Cooper's hawk (*Accipiter cooperii*), included on CDFW's Special Animals List
- sharp-shinned hawk (*Accipiter striatus*), included on CDFW's Special Animals List
- tricolored blackbird (*Agelaius tricolor*), a California Species of Special Concern
- oak titmouse (*Baeolophus inornatus*), included on CDFW's Special Animals List
- common yellowthroat (*Geothlypis trichas sinuosa*), a California Species of Special Concern
- rufous hummingbird (*Selasphorus rufus*), included on CDFW's Special Animals List
- yellow warbler (*Setophaga petechia*), a California Species of Special Concern

Of the species listed above, based on the presence of suitable nesting and foraging habitat, Cooper's hawk, and rufous hummingbird have a moderate potential to occur within the BSA. There are no CNDDB occurrences of Cooper's hawk within 5 miles of the BSA (CDFW 2019). However, the Marin County Breeding Bird Atlas shows several nesting records throughout Marin County and suggests that this species may frequently go undetected because of its secretive nesting habits (Shuford 1993). Cooper's hawks may nest and forage in the riparian trees present throughout the BSA. The steep, densely forested hillsides in the immediate vicinity of the BSA are also highly suitable for nesting and may attract Cooper's hawks to the region.

Rufous hummingbird migrates to California as early as January and leaves in October. The BSA is out of breeding range for the species, but riparian shrub and woodland within the BSA is suitable for foraging.

Based on the presence of suitable nesting and foraging habitat, the oak titmouse and yellow warbler have a high potential to occur. The BSA presents suitable foraging and nesting habitat. Riparian woodland along San Geronimo Creek constitutes suitable nesting habitat for these species, and they may forage in trees and shrubs anywhere within the BSA. Yellow warbler was also observed during the 2019 wildlife surveys.

4.4.12.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3, including a work window for nesting birds (Measure #8), preconstruction nesting bird surveys (Measure #9), biological monitoring (Measure #13), and implementation of non-disturbance buffers (Measures #10 and #24) will reduce the potential for effects to nesting birds during Project construction.

4.4.12.3. PROJECT IMPACTS

The proposed Project could result in temporary loss or disturbance of habitats that are used by nesting migratory birds. During Project-related construction, common migratory bird species may be temporarily displaced by habitat alteration or disturbed by noise from construction equipment. However, implementation of the proposed AMMs is anticipated to prevent direct mortality of migratory birds. The proposed Project may potentially remove or disturb a small amount of unoccupied habitat used by nesting or foraging migratory birds. This impact would be temporary in nature and limited to a relatively small area in relationship to the extensive nesting and foraging habitat adjacent to the BSA.

4.4.12.4. COMPENSATORY MITIGATION

As described above, the Project is not expected to adversely impact nesting birds, and therefore no compensatory mitigation is proposed.

4.4.12.5. CUMULATIVE IMPACTS

Because this proposed Project will implement AMMs to ensure no impacts to nesting birds, it will not contribute to cumulative impacts. Nesting habitat will only be temporarily disrupted within the PCA. The impacts to nesting habitat are minimal due to the large amount of similar nesting habitat available to birds in the area surrounding the BSA.

4.4.13. Roosting Bats

Bats are widespread within California and may be found in any habitat. They are nocturnal aerial predators of insects and other arthropods, and often forage over open water, marshes, and other moist, open areas where flying insects tend to congregate. Different bat species have different roosting requirements, and as such roosts can be found in a variety of habitats and locations. During the day, bats may use three types of roosts: crevices, cavities, and foliage. Crevice and cavity roosts may be found in natural and human-made features such as caves, cliffs, rock outcrops, trees, mines, buildings, bridges, and tunnels. During the breeding season (April through September), crevice and cavity roosting species typically gather in groups of mothers and young (maternity colonies) that may number in the thousands or even tens of thousands. In contrast, foliage-roosting bats may be solitary or occur in small groups while breeding. Roosts used during the day and as maternity roosts tend to be well-hidden and require precise temperature and humidity conditions that favor the growth of the young. Bats often use separate roosts at night as temporary resting locations in between foraging bouts. Night roosts are often located in more open but protected areas such as overhangs on buildings and recessed areas on the undersides of bridges where warm air is trapped.

Six special-status bat species have potential to occur within the BSA based on range, habitat, and recorded occurrences in the region. CNDDB occurrences are reported in the individual species descriptions below. Bats in general are likely to be under-reported to the CNDDB relative to their actual abundance in the environment because they are nocturnal, difficult to detect, and difficult to positively identify and census even when detected. They may be present or even abundant despite a lack of reported occurrences in the region.

4.4.13.1. PALLID BAT

The pallid bat (*Antrozous pallidus*) is a California Species of Special Concern. It is a medium-sized bat that occurs throughout much of the state. They may occur in a wide variety of grasslands, shrublands, and woodlands, though they are generally found in dry, open areas at lower elevations. They typically fly low while foraging for prey, which are caught on the ground or gleaned off of foliage. Prey species include beetles, orthopterans, homopterans, moths, spiders, scorpions, and solpugids (CDFW 2016). The species is capable of taking heavy-bodied insects such as June beetles and Jerusalem crickets as well (Jameson and Peeters 2004). Pallid bats make day roosts within crevices and cavities in caves, rock outcrops, crevasses, mines, tree hollows,

bridges, and buildings. Night roosts are typically in more open areas such as under porches and open buildings. Pallid bats are particularly sensitive to disturbance from humans at roost sites (CDFW 2016).

There are three occurrences of pallid bat recorded within 5 miles of the BSA. All three occurrences, dated 1892, 1901, and 1912, are about 1.88-1.90 miles east of the BSA.

Suitable foraging habitat for pallid bats is present within the BSA, as this species likely travels throughout the riparian corridor of San Geronimo Creek hunting insects. Suitable day roost habitat is present within trees in the riparian corridor, but no large trees of the type typically associated with pallid bat roosts are present within the BSA. There is marginally suitable night roost habitat within the Mountain View Road Bridge, though no evidence of either day or night roosting by pallid bats or any other bat species was observed. Based on their known presence in the region and the presence of suitable habitat, pallid bats are considered to have a high potential to occur.

4.4.13.2. TOWNSEND'S BIG-EARED BAT

Townsend's big-eared bat (*Corynorhinus townsendii*) is a California Species of Special Concern (CDFW 2018) and is also a candidate for listing as threatened or endangered under the CESA (California Fish and Game Commission 2013). Townsend's big-eared bat is found throughout California except at high elevations. This species is dependent on cave-like roosting habitat and prefers to forage in native vegetation. Townsend's big-eared bat colonies are typically found in caves, mines, and buildings (Jameson and Peeters 2004), though individuals have been occasionally observed roosting in cavities in very large trees (Fellers and Pierson 2002). This species is highly sensitive to disturbance at roost sites (CDFW 2016). They feed primarily on small moths, though beetles and other insects may be taken as well. They capture prey both in flight and by gleaning insects from foliage.

The closest occurrence of Townsend's big-eared bat was recorded in 2013 approximately 3 miles southwest of the BSA. Additional occurrences were recorded in 2006 approximately 4.42 miles to the south, and in 1994 approximately 4.14 miles to the northwest. A fourth occurrence was recorded in 1987 approximately 4.40 miles to the northwest, but is now considered to be possibly extirpated.

Suitable foraging habitat for Townsend's big-eared bats is present within the BSA and throughout the surrounding riparian corridor of San Geronimo Creek. There are no very large trees within the BSA typical of the type used by Townsend's big-eared bats for

roosting. There is no suitable day roost habitat in the structure of the Mountain View Road Bridge, as it lacks any recessed cave-like spaces. There is marginally suitable night roost habitat within the bridge, though no evidence of either day or night roosting by Townsend's big-eared bats or any other bat species was observed. Townsend's big-eared bats are considered to have a moderate potential to forage within the BSA based on the presence of suitable foraging habitat and the species' known presence in the region, but are not expected to roost within the BSA.

4.4.13.3. SILVER-HAIRED BAT

The silver-haired bat (*Lasionycteris noctivagans*) is included on CDFW's California State Special Animals List (CDFW 2018). This species is widely distributed in forested habitats throughout California, occurring from the San Francisco Bay Area north along the coast range, as well as the Sierra Nevada Mountains. Silver-haired bat roost primarily as individuals or small groups in trees, but will occasionally enter buildings as well. They are primarily adapted to eat moths, but will sometimes take other flying insects (Jameson and Peeters 2004).

There is one CNDDB occurrence of silver-haired bat recorded in 1904, approximately 4.50 miles northwest of the BSA (CDFW 2019).

There is suitable roosting habitat for silver-haired bats in trees throughout the BSA, and they may forage anywhere within the BSA and surrounding riparian corridor. This species roosts primarily in foliage and is not expected to roost on the bridge itself. Based on the presence of suitable foraging and tree roosting habitat, silver-haired bats are considered to have a low potential to occur within the BSA.

4.4.13.4. WESTERN RED BAT

The western red bat (*Lasiurus blossevillii*) is a California Species of Special Concern (CDFW 2018). It is widely distributed throughout California and known to occur in a variety of habitats, including forested canyons, riparian zones and arid areas where they primarily roost in trees and sometimes shrubs (Reid 2006). This non-colonial species roosts in foliage, under overhanging leaves. Western red bats are commonly associated with cottonwood/sycamore and willow riparian habitats (Pierson et al. 2006; Pierson and Rainey 2002).

There are no recorded occurrences of western red bat in the CNDDB within 5 miles of the BSA (CDFW 2019).

There is suitable foraging habitat for western red bats within the surrounding riparian corridor in the BSA. Marginal roosting habitat is present in trees throughout the BSA. This species roosts exclusively in foliage and is not expected to roost on the bridge itself. Based on the presence of suitable foraging habitat, western red bats are considered to have a low potential to occur within the BSA.

4.4.13.5. HOARY BAT

The hoary bat (*Lasiurus cinereus*) is included on CDFW's California State Special Animals List (CDFW 2018). It is a widespread species found in a variety of habitats throughout California. This solitary bat is most commonly found in association with forested habitats near water (CDFW 2016). Roosting sites are generally in dense foliage of both coniferous and deciduous trees, at the ends of branches 10-40 feet above the ground, and with open flying space below (Bolster 1998). Moths are the primary food source for hoary bats (Black 1974). Females give birth to young in mid-May through early July. There is one occurrence of hoary bat recorded in 1933 located approximately 3.32 miles north of the BSA. Three more occurrences, all recorded in 1954, are located between 4.51 and 4.76 miles west and southwest of the BSA (CDFW 2019).

There is suitable foraging habitat for hoary bats within the surrounding riparian corridor in the BSA. Marginal roosting habitat is present in trees throughout the BSA. This species roosts exclusively in foliage and is not expected to roost on the bridge itself. Based on the presence of suitable foraging habitat, hoary bats are considered to have a low potential to occur within the BSA.

4.4.13.6. YUMA MYOTIS

The Yuma myotis (*Myotis yumanensis*) is included on CDFW's Special Animals List (CDFW 2018). It is a common species occurring throughout California except in the arid Mojave and Colorado desert regions. They feed on a variety of small insects, and generally forage over water sources such as rivers, lakes, ponds, and stock tanks, most often in open woodland or forest areas. Roosting habitat includes crevices in caves, large trees, mines, buildings, tunnels, and bridges. During the April through September breeding season the females gather into maternity colonies that number in the hundreds to thousands of individuals. Night roosts may be located in more open areas (CDFW 2016).

There are no recorded occurrences of Yuma myotis in the CNDDB within 5 miles of the BSA (CDFW 2019).

Marginally suitable day roosting habitat for Yuma myotis is present in small gaps between the wooden planks of the Mountain View Road Bridge, but no evidence of any day roosts was observed. Yuma myotis may also roost in tree crevices or cavities throughout the BSA and forage in the surrounding riparian corridor. Yuma myotis is a very common species in this part of California, and they frequently roost in bridges. Based on the presence of suitable roosting and foraging habitat and the species' ubiquity in the region, Yuma myotis is considered to have a moderate potential to occur within the BSA.

4.4.13.7. SURVEY RESULTS

The Mountain View Road Bridge appears to be a flatbed railroad car bridge with a wooden deck supported by metal undercarriage. Although limited day roost habitat is present in a small number of gaps between the wooden slats making up the bridge deck, and night roosting habitat is present in recessed places near the bridge abutments, no evidence of use by bats (such as guano or urine staining) was observed anywhere on the bridge. The riparian corridor surrounding the Mountain View Road Bridge provides suitable foraging habitat for numerous bat species. No very large trees of the type associates with large bat roosts were observed, but at least one tree near the bridge had an obvious hollow that could provide roosting habitat for individual or small numbers of bats. Foliage-roosting bats may also use the dense canopy of trees within and adjacent to the BSA for roosting.

4.4.13.8. AVOIDANCE AND MINIMIZATION EFFORTS

Implementation of the AMMs outlined in Section 1.3 will ensure that the Project activities avoid and/or minimize potential effects to roosting bats within the BSA. These measures include preconstruction roosting bat surveys (Measure #11), biological monitoring (Measure #13), worker environmental awareness training (Measure #14), and construction activities around roosting bats (Measure #26).

4.4.13.9. PROJECT IMPACTS

There are no confirmed bat roosting sites present within the BSA. The current bridge structure may act as a potential roosting site for Yuma myotis. Minimal tree coverage is present in the BSA to act as roosting habitat. Bats will more likely forage in trees in the BSA. AMMs will be implemented to reduce impacts to bats.

4.4.13.10. COMPENSATORY MITIGATION

No bat species expected to occur in the BSA is protected under any regulation that would require compensatory mitigation. Further, since there would be minimal impacts

on these species or their habitat from the proposed Project, the County has determined that no compensatory mitigation is necessary.

4.4.13.11. CUMULATIVE IMPACTS

Because this Project will have no impacts to roosting bats, it will not contribute to cumulative impacts.

Chapter 5. Conclusions and Regulatory Determinations

This chapter summarizes the specific technical studies, permits, and agreements that will be required to comply with federal and state natural resource laws, regulations, and policies for the proposed Mountain View Road Bridge Replacement Project.

5.1. Federal Endangered Species Act Consultation Summary

Formal consultation with USFWS and NMFS under the federal ESA will be initiated with the submission of a BA for each respective agency. BOs will be obtained from the USFWS and NMFS. The County has determined that the Project *may affect, and is likely to adversely* affect coho salmon, steelhead, and California red-legged frog; and that the Project *may affect, but is not likely to adversely affect* the northern spotted owl. A BO will be obtained from NMFS based on the results of consultation for effects to coho salmon and steelhead critical habitat, which the Project *may affect, but is not likely to adversely affect*. No effects to any other federally listed or candidate species are anticipated.

5.2. Essential Fish Habitat Consultation Summary

The BSA is within the USGS Hydrologic Unit #18050005, which is EFH for coho salmon. Caltrans, as the Federal Highway Administration's (FHWA) non-Federal representative, will conduct a consolidated EFH consultation with the Section 7, FESA consultation with NMFS. The project *may affect, but is not likely to adversely affect* EFH for coho salmon. If NMFS finds that the proposed project could adversely affect EFH, NMFS would provide conservation recommendations.

5.3. California Endangered Species Act Consultation Summary

Marin County will consult with CDFW to ensure that any action they undertake in the proposed Project is not likely to jeopardize the continued existence or result in destruction or adverse modification of essential habitat of the coho salmon, a state endangered species. An Incidental Take Permit will be required for coho salmon.

5.4. California Fully Protected Species (Fish and Game Code Sections 3511, 4700, 5050 and 5515) Consultation Summary

California developed the Fully Protected designation, administered by CDFW, as an additional way to identify and provide protection for species that are rare or face possible extinction. The Fully Protected designation is most restrictive regarding take of species, only allowing take for necessary scientific research. No fully protected species will be affected by the Project. CDFW cannot issue any take permit for this species.

5.5. Wetlands and Other Waters Coordination Summary

5.5.1. Section 404 of the Federal Clean Water Act

A Section 404 permit is necessary when a project will result in fill, both permanent and temporary, to waters under USACE jurisdiction. A jurisdictional delineation of these resources has been completed and will be submitted to USACE for verification. Based on the preliminary jurisdiction, there will be temporary and permanent impacts to jurisdictional water features within the BSA. Therefore, a Section 404 permit will be required for the proposed Project. Caltrans anticipates utilization of Nationwide Permit 6 and 14, under Section 404.

5.5.2. Section 401 of the Federal Clean Water Act

Because 404 permits will be required for the proposed Project, a 401 Water Quality Certification from the San Francisco Bay RWQCB also will be required.

5.5.3. Executive Order 11990

Compliance with this Executive Order will be attained through Caltrans coordination with the USACE and the RWQCB. A preliminary jurisdictional delineation of wetlands and other waters of the U.S. within the BSA has been prepared for submission to the USACE. Permits will be sought as appropriate as described in Sections 5.5.1 and 5.5.2.

5.5.4. California Department of Fish and Game Code Sections 1600-1616

A Section 1600 Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The

proposed Project will result in alternations to the bed and banks of San Geronimo Creek. Therefore, the proposed Project will require a 1600 permit from CDFW.

5.6. Other Federal, State, and Local Regulations

5.6.1. Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered a "take" and is potentially punishable by fines and/or imprisonment. Any proposed project must take measures to avoid the take of any migratory birds, nests, or eggs. Caltrans will comply with the MBTA through the proposed AMMs.

5.6.2. California Fish and Game Code

The majority of birds and mammals found in the BSA are protected under the California FGC Through implementation of the proposed AMMs, the take of nests, eggs, young, or individuals of bird species is not anticipated. California FGC Sections 3503-3505, 3513, and 3800 make unlawful the take or possession of all migratory nongame birds and their nests. Caltrans will comply with these code sections through the proposed AMMs. California FGC Section 4150 states that all non-game mammals or parts thereof may not be taken or possessed except as provided otherwise in the code or in accordance with regulations adopted by CDFW. Activities resulting in mortality of non-game mammals or disturbances that causes the loss of maternity colonies of bats may be considered "take" by CDFW. Again, the AMMs implemented to protect the special-status species discussed in this NES also protect non-game mammals.

5.6.3. Executive Order 13112 – Invasive Species

The intent of Executive Order 13112, Invasive Species, is "to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause." The Project AMMs will control invasive species introduction and spread.

5.6.4. Native Plant Protection Act

California's Native Plant Protect Act (NPPA) requires all state agencies to conserve endangered and rare native plants (California FGC Sections 1900-1913). Provisions of NPPA prohibit the taking of listed plants from the wild and require notification of the CDFW at least 10 days prior to any change of land use. As required, a botanical survey has been conducted within the BSA. The County will continue to consult with CDFW during Project planning to comply with the provisions of this act; however, no effects to endangered or rare native plants are expected.

5.6.5. Marin County Native Tree Protection and Preservation Ordinance

Marin County adopted the Native Tree Protection and Preservation Ordinance in 2002. The Ordinance protects native, heritage trees in unincorporated portions of the county by limiting their removal and requiring three new replacement tree plantings for each tree that is removed. Heritage trees include bigleaf maple, box elder (*Acer negundo*), California buckeye, Oregon ash, and red alder. All of these trees are present within the proposed Project's BSA. Any project that may require tree removal must apply for a Tree Removal Permit. Trees within Caltrans right-of-way are under state control and are not subject to this ordinance. The County and Caltrans will coordinate with local agencies in a good faith effort to address tree ordinances.

5.7. Federal Highway Administration Policies

5.7.1. Mitigation for Impacts on Natural Lands (23 CFR Section 771.105)

Construction, operation and maintenance of highway projects can cause impacts to important, natural, upland ecosystems, and landscapes as well as to wetlands. According to authority established under the Intermodal Surface Transportation Efficiency Act (ISTEA) Section 1170, Surface Transportation Program (23 USC Section 133 [b][1]), where such impacts are determined to be adverse or unacceptable through the NEPA compliance process, they should be mitigated by feasible and practicable measures. Adverse or unacceptable ecological impacts may be those that threaten the continued existence of species listed under FESA or cause substantial detrimental effects to, or losses of natural ecological importance, or have substantial detrimental effects to, or losses of, natural ecological communities that are biologically unique, of special ecological importance, or have substantial societal value. Feasible or

practical mitigation measures include, but are not limited to, restoration of altered or degraded landscapes to replace the impacted biological resources, or preservation or enhancement of existing resources where such opportunities exist.

5.7.2. Designation of Non-Federal Representative (MAP-21)

On September 25, 2012, the FHWA and Caltrans signed the Memorandum of Understanding between Federal Highway Administration and the California Department of Transportation concerning the State of California's Participation in the Project Delivery Program Pursuant to 23 USC 327, which became effective on October 1, 2012. This memorandum of understanding was signed pursuant to the Moving Ahead for Progress in the 21st Century Act (MAP-21), and allows the Secretary of Transportation to assign, and the State of California to assume all responsibilities for consultation and coordination with federal resource, regulatory, and land management agencies for most federal-aid highway projects in California. The assignment of environmental decision making to Caltrans includes the federal-aid highway projects on federal lands and the FHWA's federal lands ("direct federal") projects when Caltrans designs and constructs the projects. By statute, the State is deemed to be a federal agency for these assigned responsibilities. Detailed information about NEPA Assignment is published online at:
http://www.dot.ca.gov/hq/env/nepa_pilot/html/nepa_delegation_pilot_program.htm.

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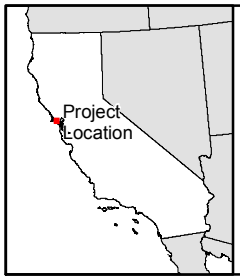
Appendix A Project Figures

Figure 1: Project Location



USGS 7.5' Quad:
San Geronimo (1978)

Legal Description:
T2N, R8W Sections 13, 14

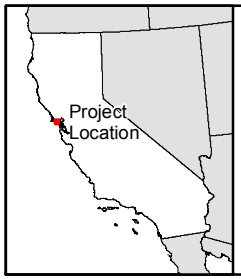
N

Scale 1:24,000
1 Inch = 2,000 Feet

0 250 500
Meters
0 1,000 2,000
Feet

Figure 1:
Project Location
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 2: Biological Study Area



Legend

Biological Study Area

Creek

N

Scale 1:1,200
1 Inch = 100 Feet

0 10 20
Meters
0 50 100
Feet

Figure 2:
Biological Study Area
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 3: Vegetation and Land Cover Types within the Biological Study Area

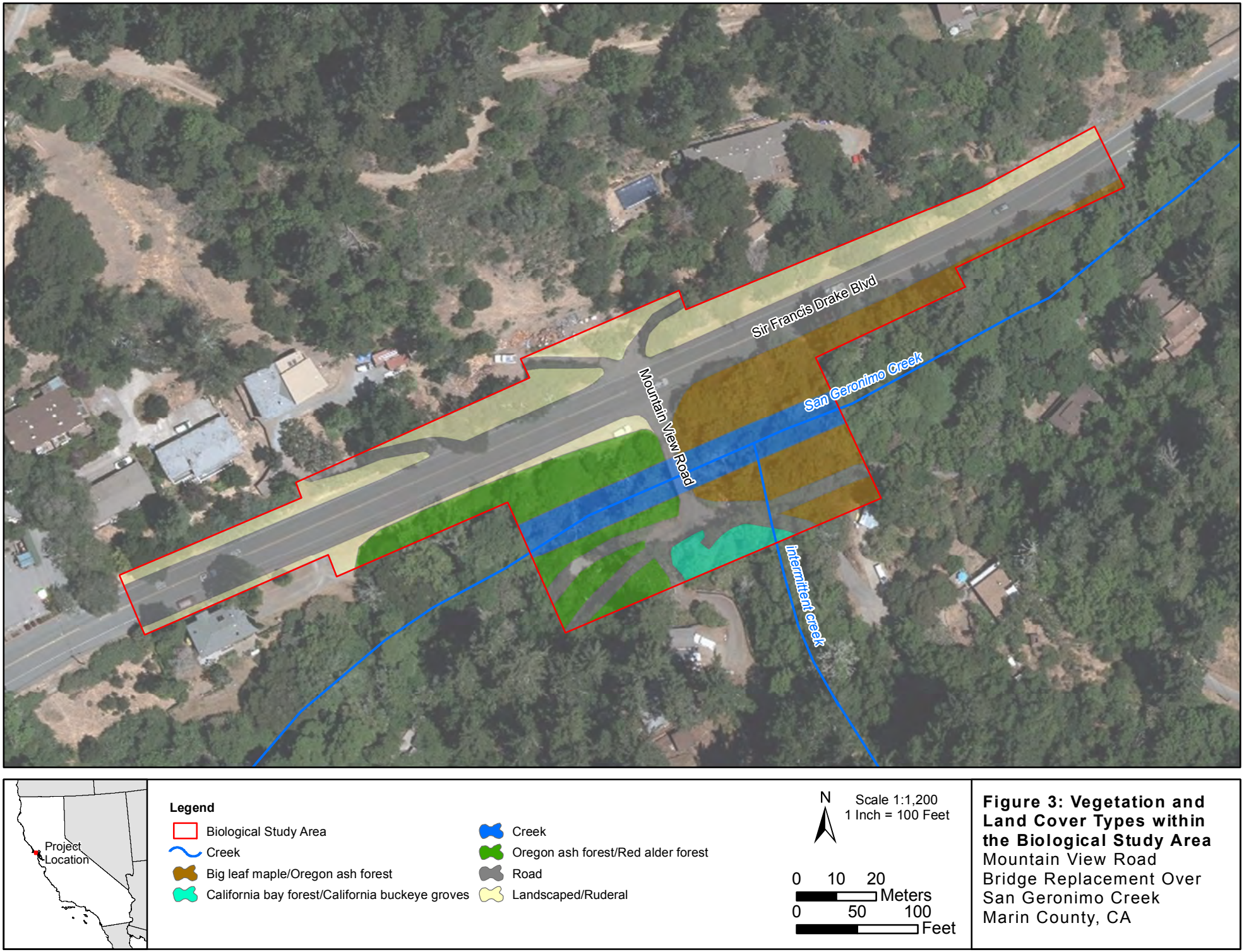
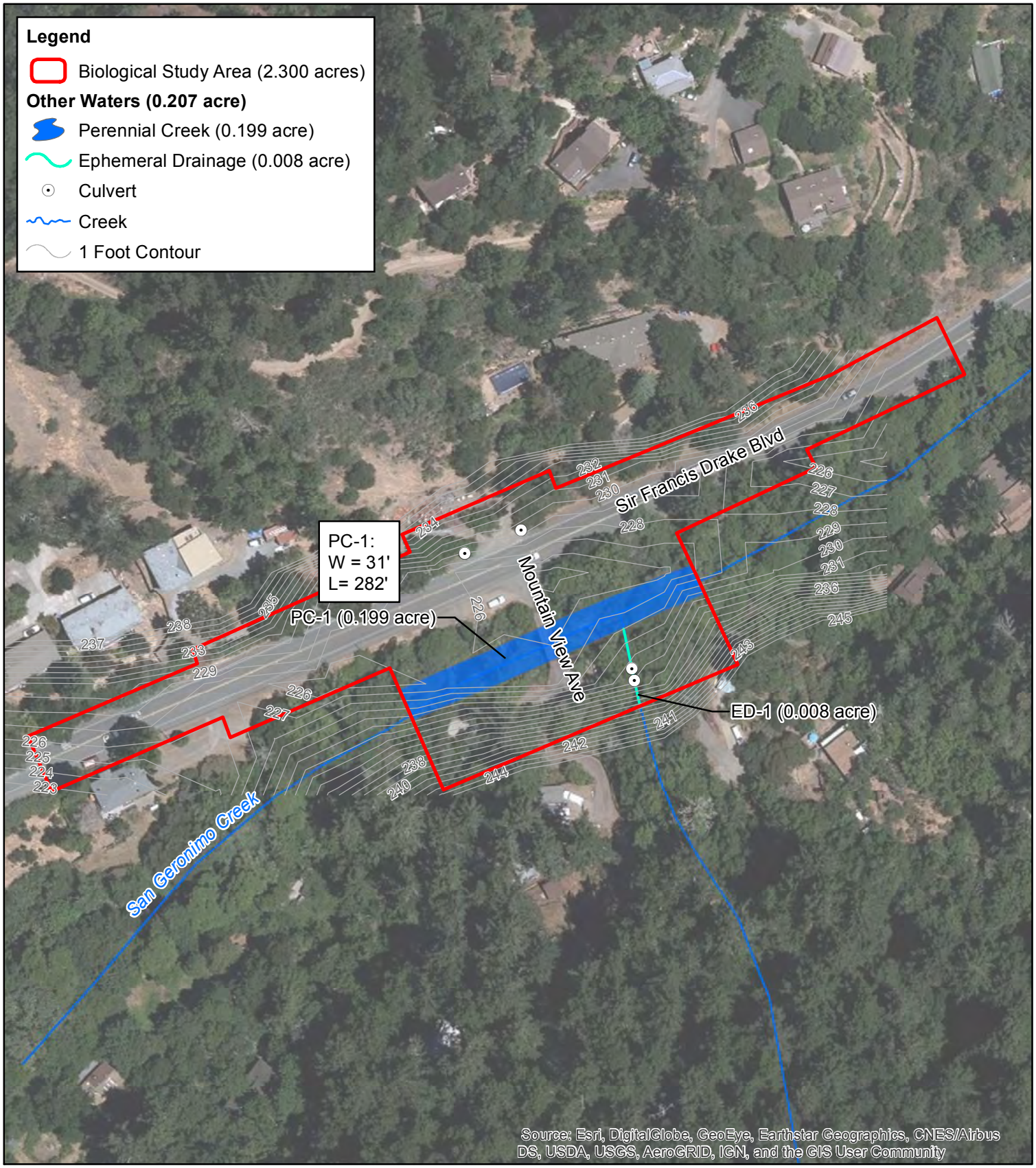
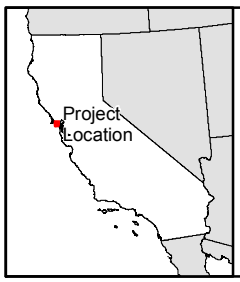


Figure 3: Vegetation and Land Cover Types within the Biological Study Area
Mountain View Road Bridge Replacement Over San Geronimo Creek
Marin County, CA

Figure 4: Waters of the U.S. in the Biological Study Area





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Scale 1:1,400
1 Inch = 117 Feet

0 10 20 Meters
0 50 100 Feet

Figure 4:
Waters of the U.S. in the Biological Study Area
Mountain View Road Bridge Replacement Over San Geronimo Creek
Marin County, CA

Figure 5: California Natural Diversity Database Plant Species within 2 Miles of the Biological Study Area

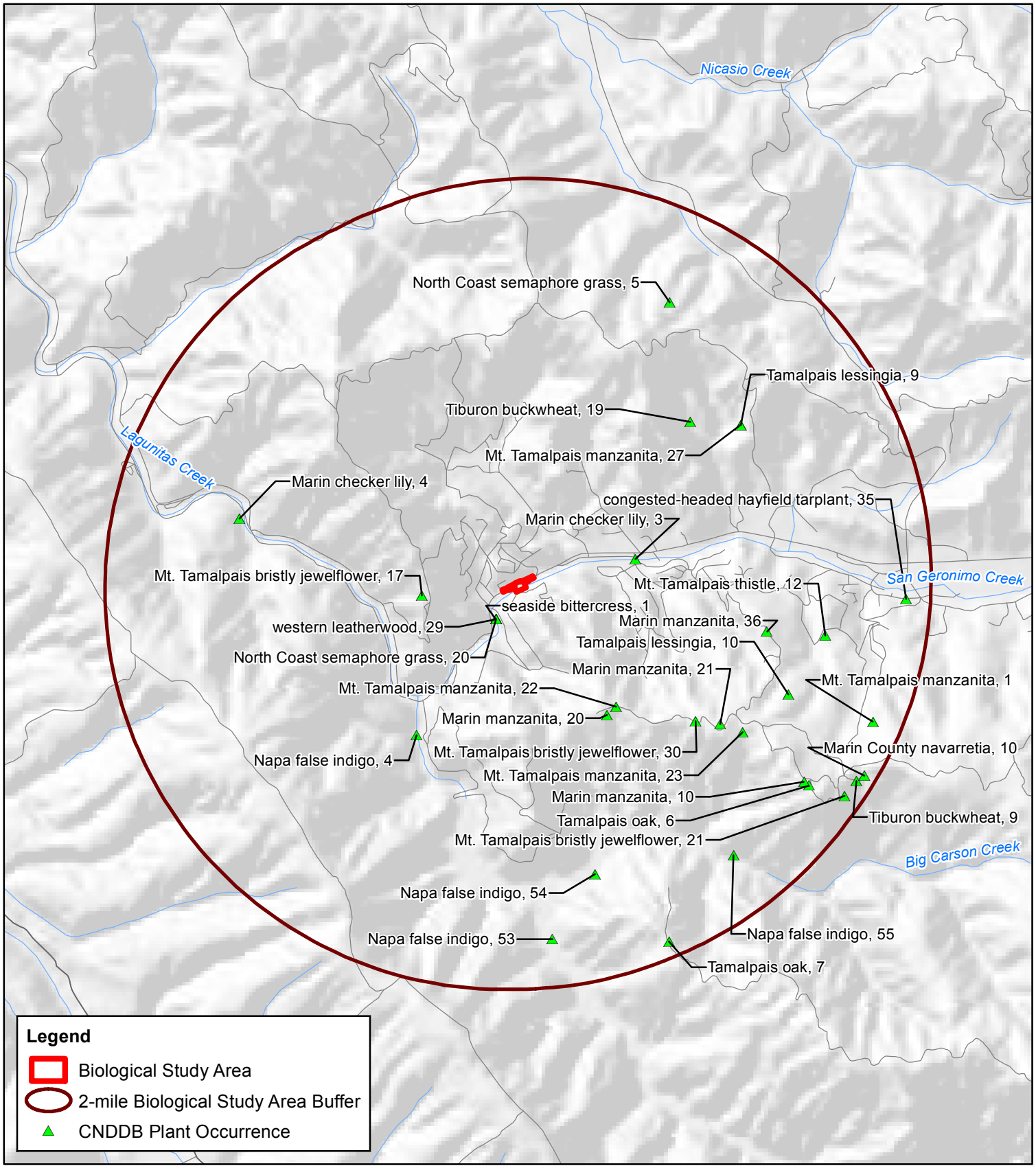


Figure 5: CNDDB Plant Species within 2 miles of the Biological Study Area
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 6: Tree Survey Results

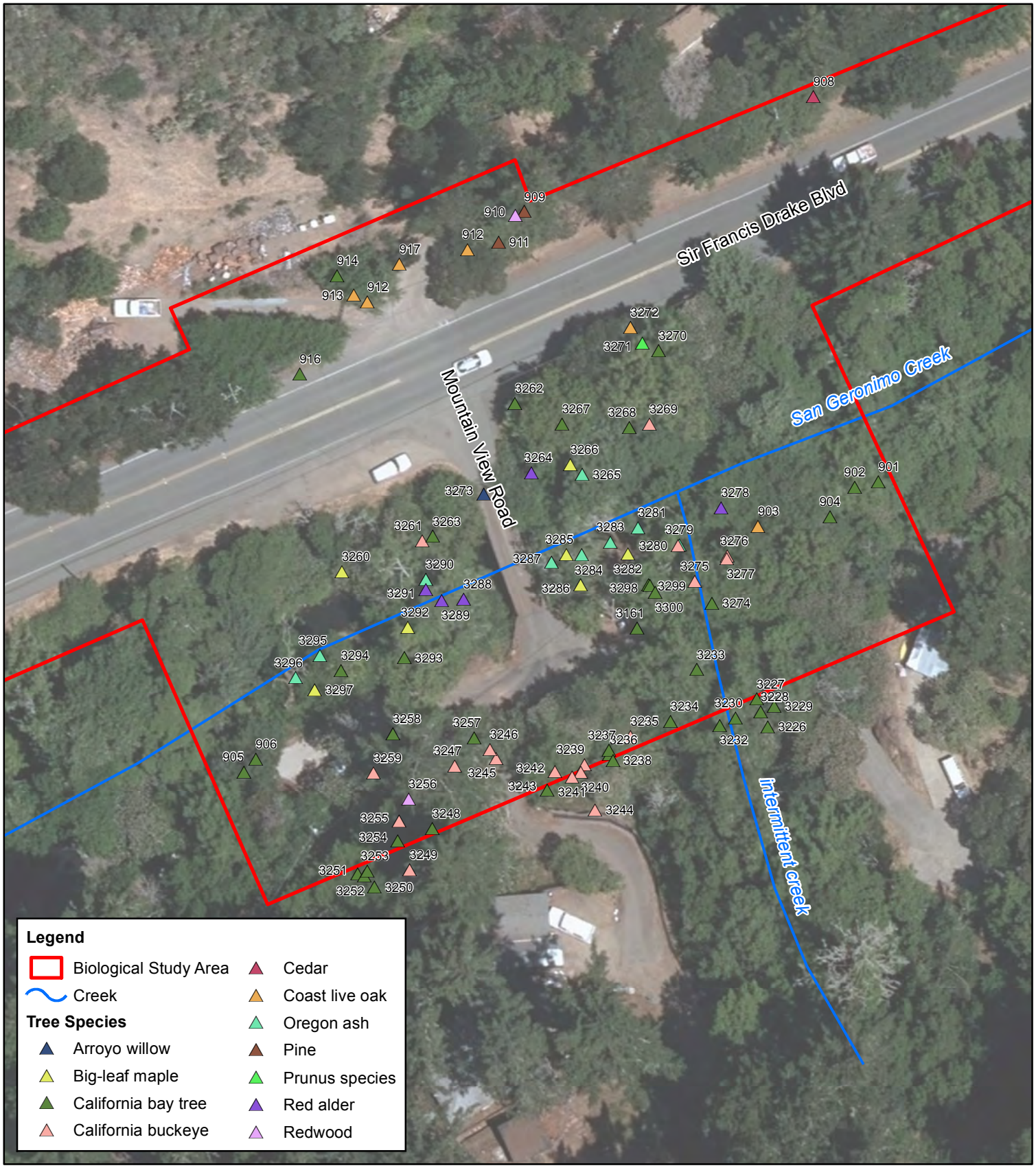
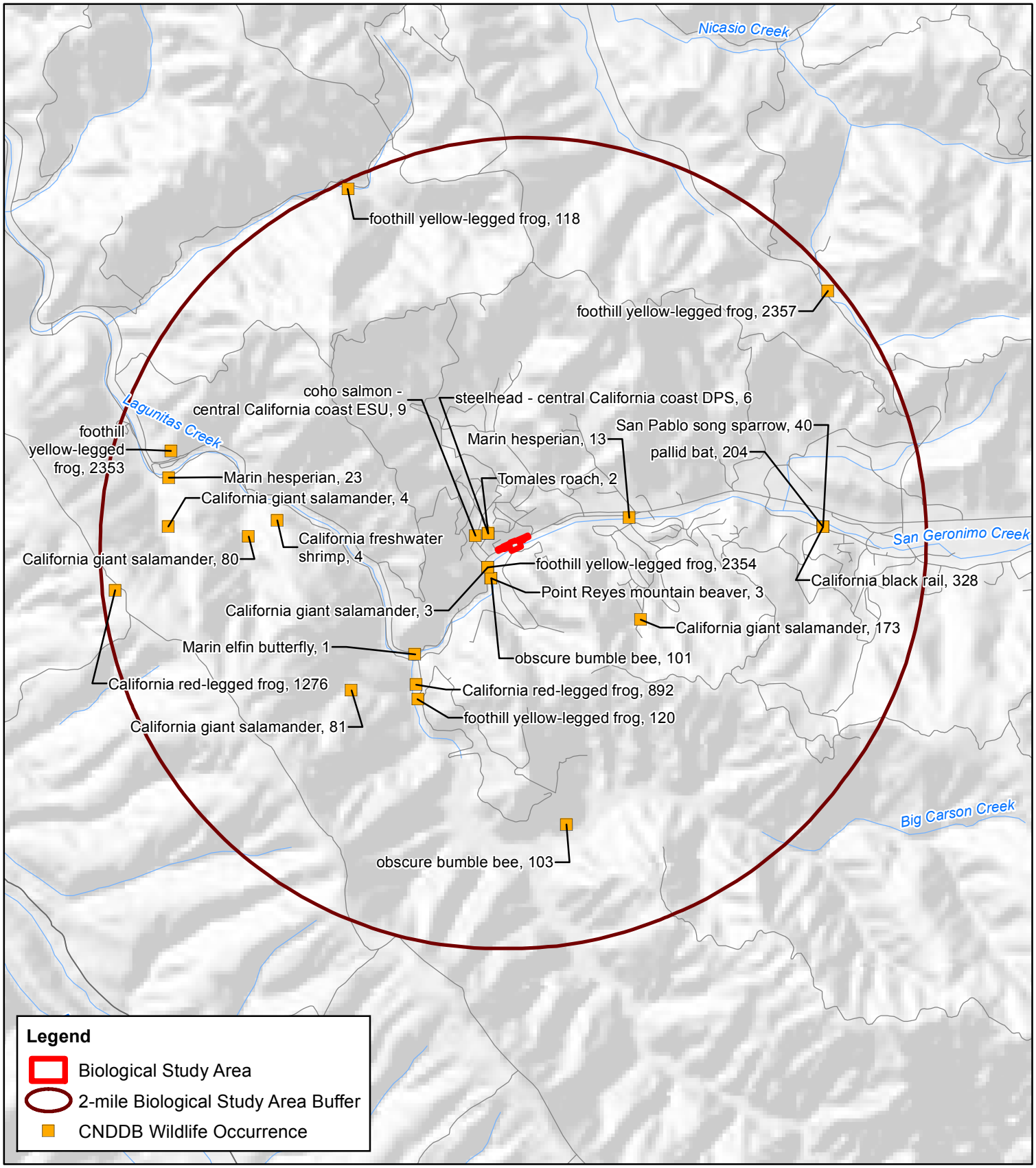
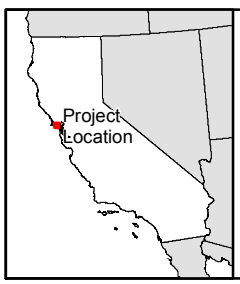


Figure 6:
Tree Survey Results
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 7: California Natural Diversity Database Plant Wildlife Species within 2 Miles of the Biological Study Area





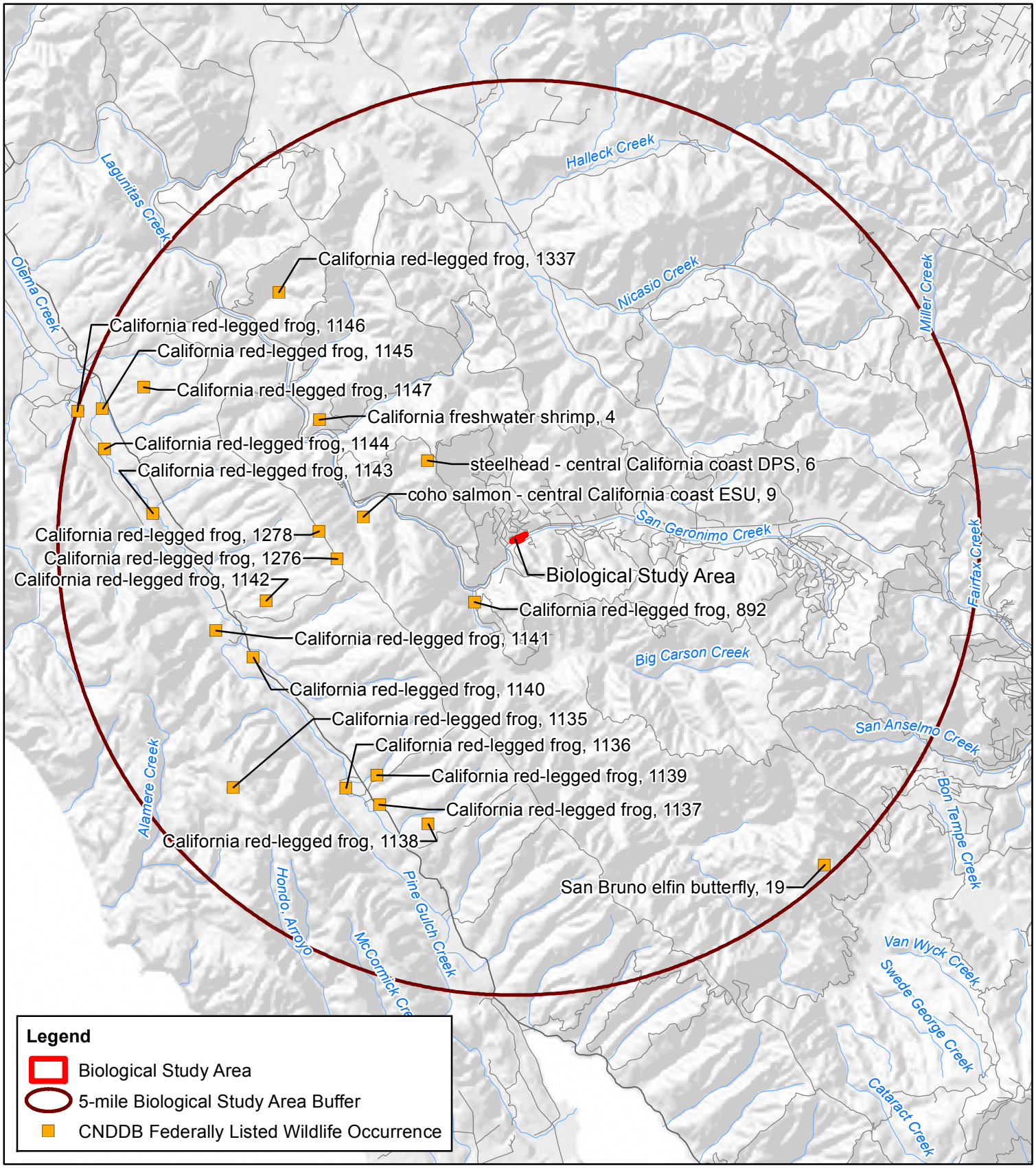
N

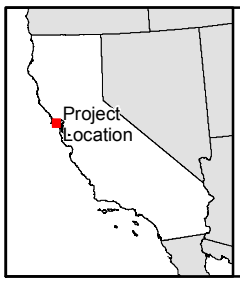
Scale 1:42,000
1 Inch = 3,500 Feet

0 290 580
Meters
0 1,750 3,500
Feet

Figure 7: CNDDB Wildlife Species within 2 miles of the Biological Study Area
Mountain View Road Bridge Replacement Over San Geronimo Creek
Marin County, CA

Figure 8: CNDDB Occurrences of Federally Listed Species within 5 Miles of the Biological Study Area





N

Scale 1:92,000
1 Inch = 7,667 Feet

0 1 2 Kilometers

0 1 2 Miles

Figure 8: CNDDB Occurrences of Federally listed species within 5 miles of the Biological Study Area
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 9: Critical Habitat within 5 Miles of the Biological Study Area

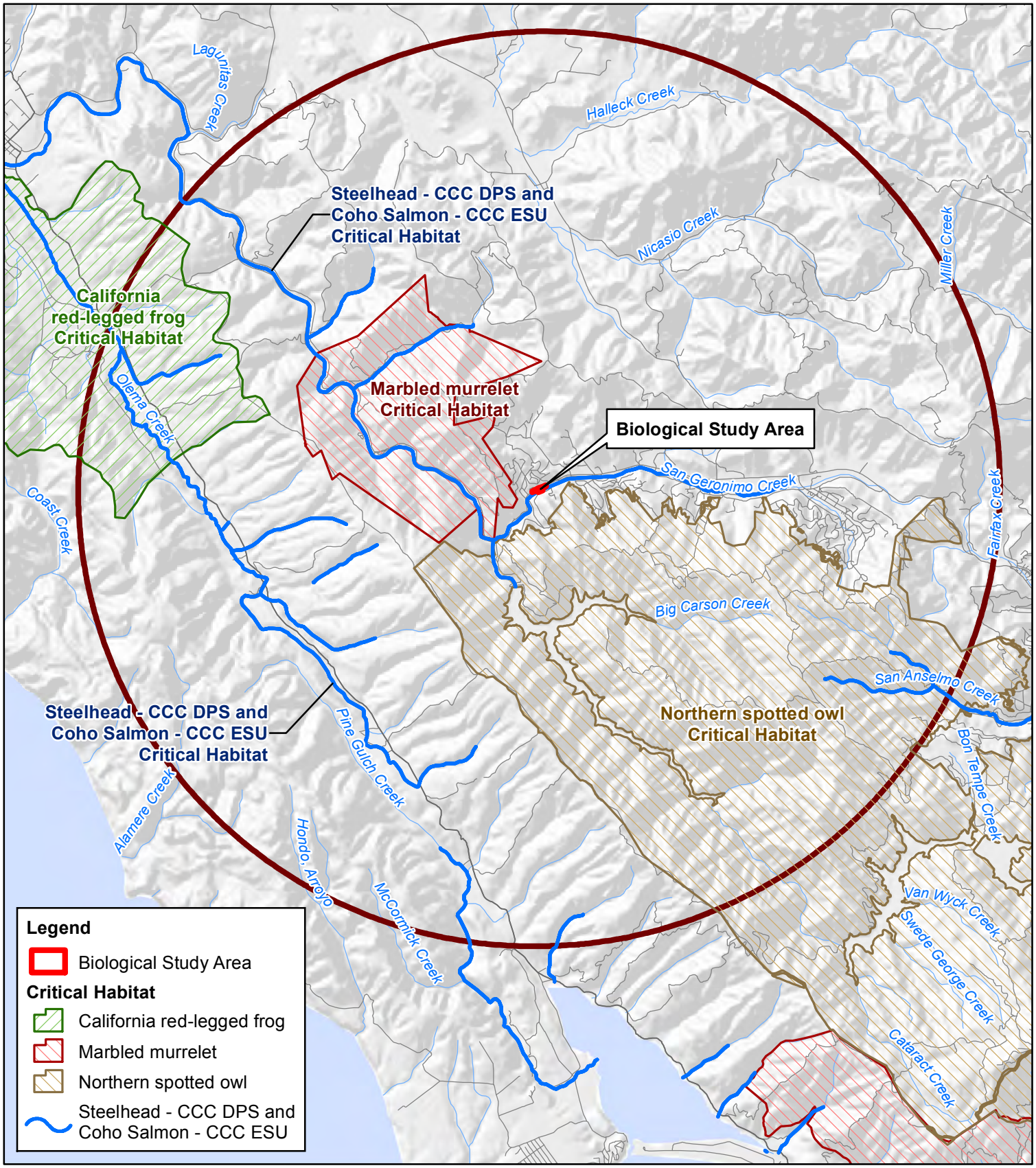
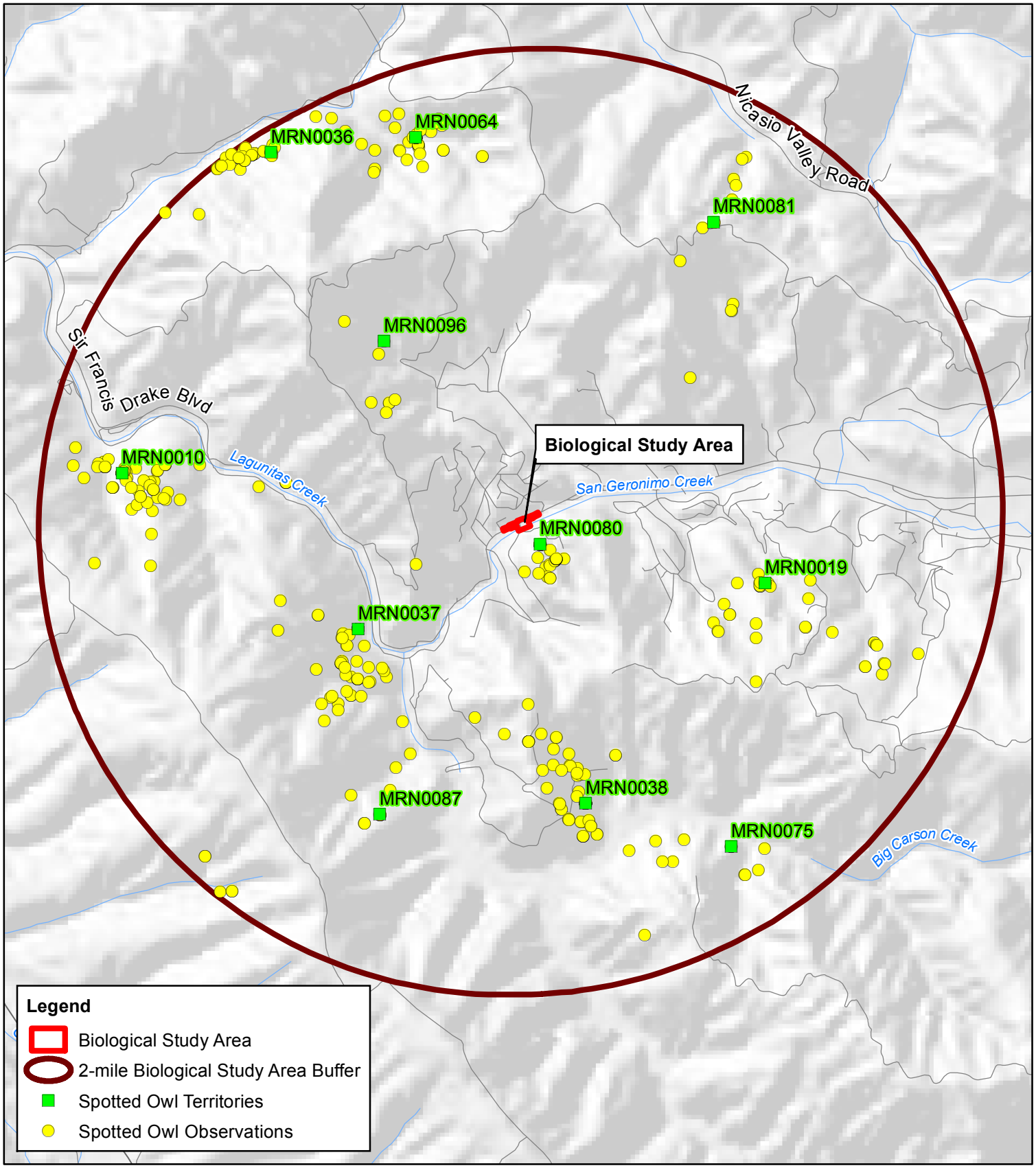
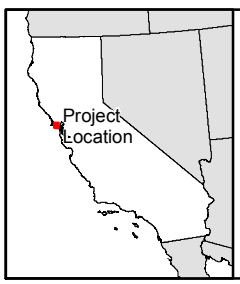


Figure 9: Critical Habitat within 5 miles of the Biological Study Area
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 10: Spotted Owl Records within 5 Miles of the Biological Study Area





N

Scale 1:36,000
1 Inch = 3,000 Feet

0 250 500
Meters
0 1,500 3,000
Feet

Figure 10: Spotted owl Records within 2 miles of the Biological Study Area
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 11: Project Elements

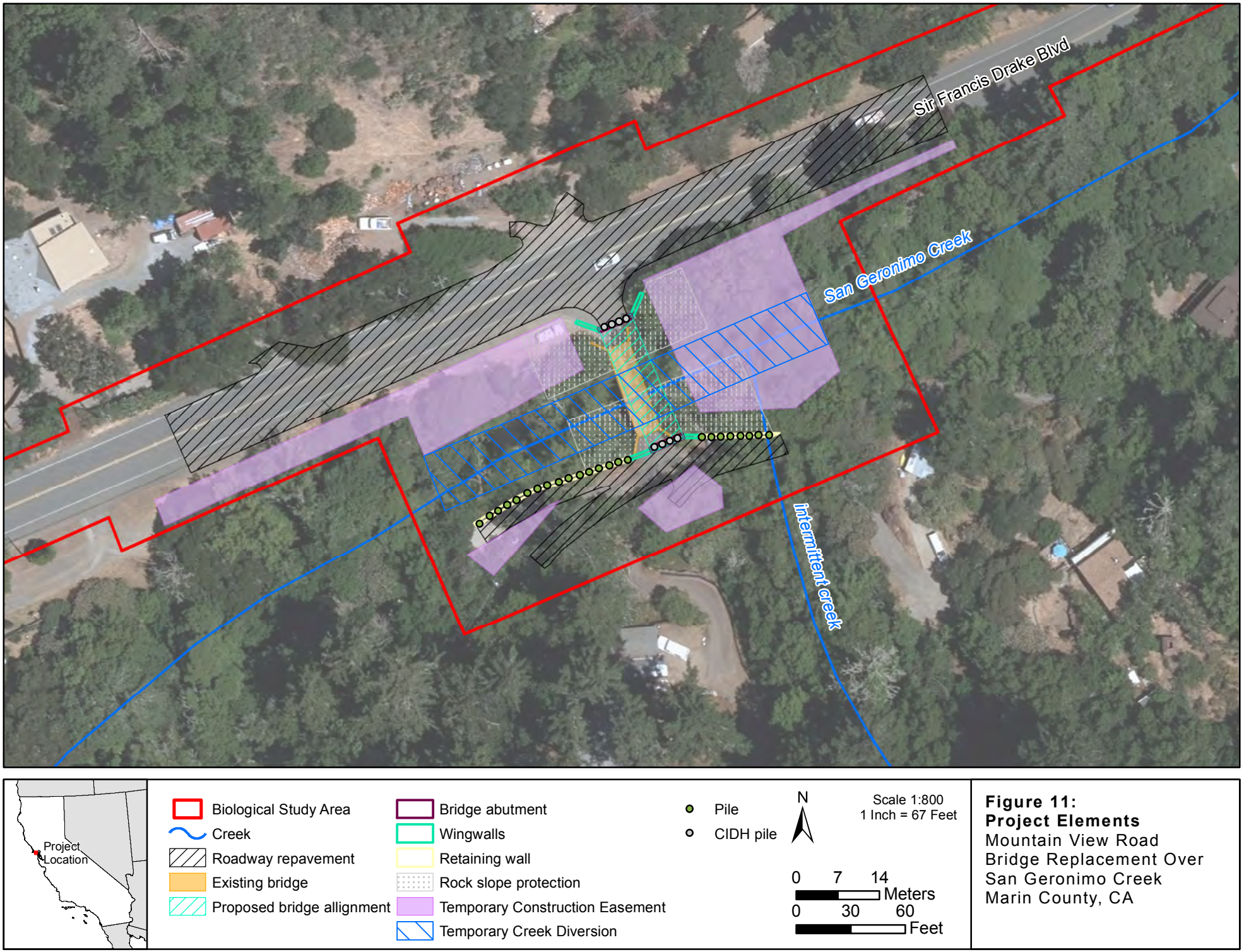


Figure 11:
Project Elements
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Figure 12: Project Impacts

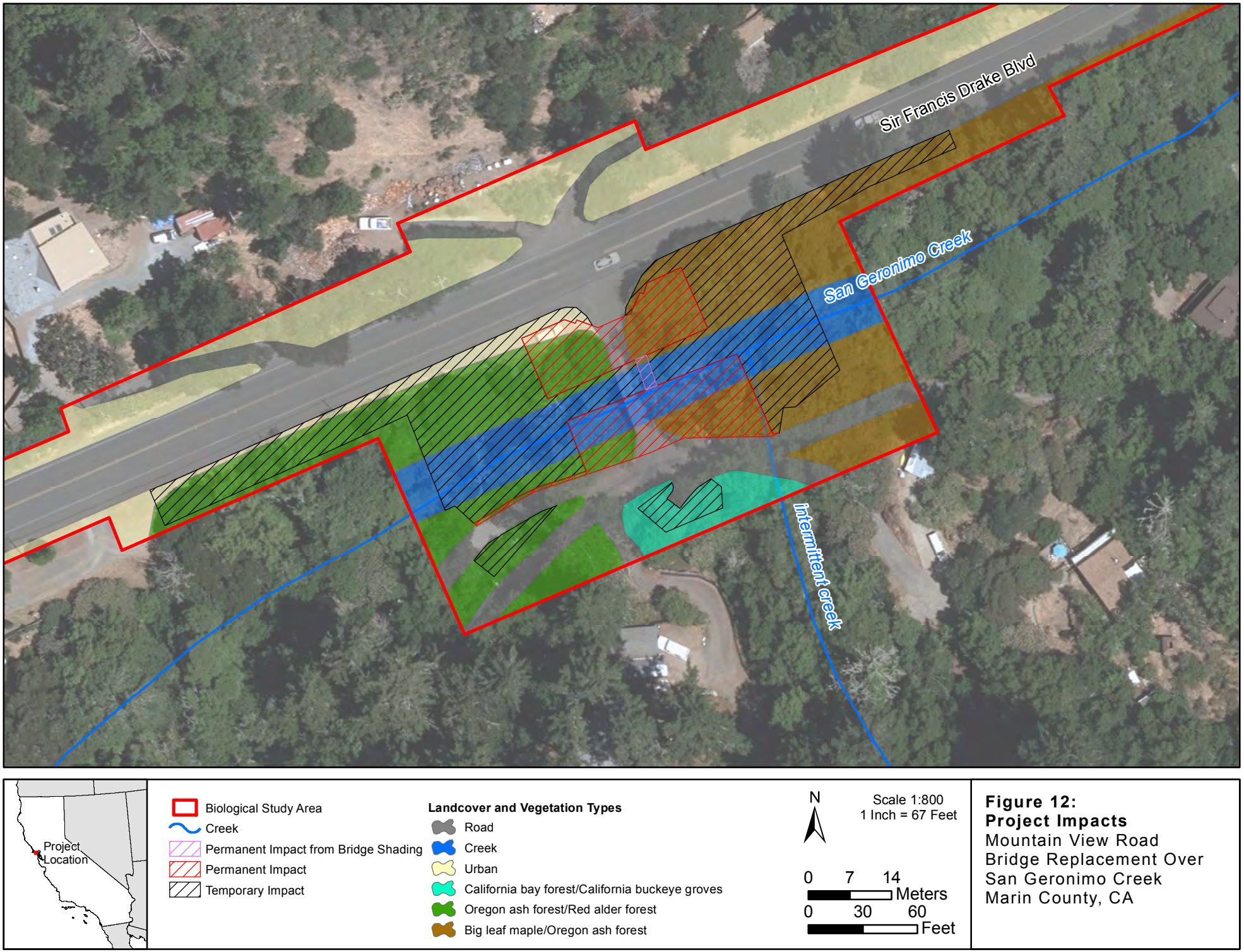


Figure 12:
Project Impacts
Mountain View Road
Bridge Replacement Over
San Geronimo Creek
Marin County, CA

Appendix B USFWS Species Letter

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: June 08, 2020
Consultation Code: 08ESMF00-2019-SLI-2082
Event Code: 08ESMF00-2020-E-06517
Project Name: Mountain View Road Bridge Replacement Project

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: 08ESMF00-2019-SLI-2082

Event Code: 08ESMF00-2020-E-06517

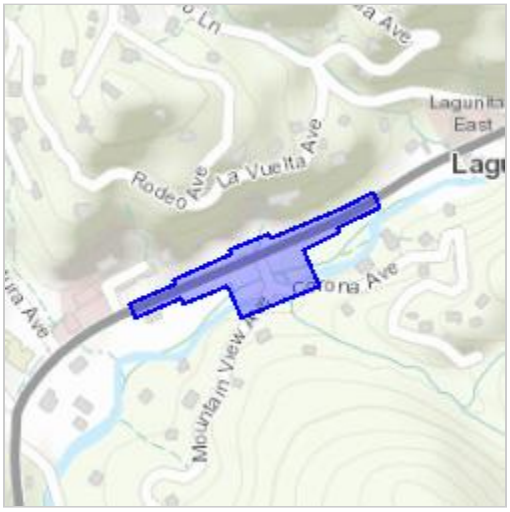
Project Name: Mountain View Road Bridge Replacement Project

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: The Mountain View Road Bridge Replacement Project proposes to replace the existing bridge over Mountain View Road just off of Sir Francis Drake Boulevard. The project is located in unincorporated Marin County in the community of Lagunitas/Forest Knolls Bridge replacement will include replacing the existing bridge structure with a new, wider and longer precast prestressed concrete slab, temporarily shifting the bridge alignment to the east, constructing new bridge abutments, raising the roadway and bridge profile to accommodate for 100-year flood elevation, and relocating overhead and underground utilities.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.0130439008055N122.69945149878521W



Counties: Marin, CA

Endangered Species Act Species

There is a total of 12 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.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
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

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 Species survey guidelines: https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf	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
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

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	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
Tiburon Paintbrush *Castilleja affinis ssp. neglecta* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2687	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Re: Federal Highway Administration, Mountain View Road Bridge Replacement 5927 (094) [Local Assistance]

NMFSWCRCA Specieslist - NOAA Service Account
<nmfswcrca.specieslist+canned.response@noaa.gov>

Thu 7/23/2020 10:16 AM

To: Harding, Keevan@DOT <Keevan.Harding@dot.ca.gov>

Receipt of this message confirms that NMFS has received your email to nmfswcrca.specieslist@noaa.gov. If you are a federal agency (or representative) and have followed the steps outlined on the California Species List Tools web page (http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html), you have generated an official Endangered Species Act species list.

Messages sent to this email address are not responded to directly. For project specific questions, please contact your local NMFS office.

Northern California/Klamath (Arcata) 707-822-7201

North-Central Coast (Santa Rosa) 707-387-0737

Southern California (Long Beach) 562-980-4000

California Central Valley (Sacramento) 916-930-3600

Federal Highway Administration, Mountain View Road Bridge Replacement 5927 (094) [Local Assistance]

Harding, Keevan@DOT <Keevan.Harding@dot.ca.gov>

Thu 7/23/2020 10:15 AM

To: nmfswcrca.specieslist@noaa.gov <nmfswcrca.specieslist@noaa.gov>

Federal Agency: Federal Highway Administration – California Division
Federal agency address: 650 Capitol Mall, Suite 4-100, Sacramento, CA 95814-4708
Non-federal agency representative (if any): California Department of Transportation
Non-federal agency representative (if any)address: 111 Grand Avenue. MS 10B, Oakland, CA 94612
Project title: Federal Highway Administration, Mountain View Road Bridge Replacement 5927 (094) [Local Assistance]
Point of Contact: Tom Holstein tom.holstein@dot.ca.gov, 510-286-6371, and Keevan Harding, keevan.harding@dot.ca.gov, 510-622-5912

Quad Name **San Geronimo**

Quad Number **38122-A6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) - **X**
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) - **X**
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) -
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat - **X**
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -

SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat - **X**
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -	**X**
Chinook Salmon EFH -	**X**
Groundfish EFH -	
Coastal Pelagics EFH -	
Highly Migratory Species EFH -	

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -	
MMPA Pinnipeds -	

Appendix C Special-status Plant Species Evaluated for Potential to Occur in the BSA

Federal Status designations:

FT: Threatened: Any species likely to become endangered
FE: Endangered:
--: No federal status

State Status designations:

SE: State-listed endangered
ST: State-listed threatened
SR: State-listed rare
SC: State candidate for listing
--: No state status

California Rare Plant Rank designations:

1B: Plants rare, threatened or endangered in California and elsewhere within the foreseeable future
2: Plants rare, threatened or endangered in California, but more common elsewhere
3: Plants for which more information is needed – a review list
4: Plants of limited distribution – a watch list

California Rare Plant Rank threat categories:

.1: Seriously endangered in California
.2: Fairly endangered in California
.3 Not very endangered in California

[1] Jepson eFlora (Baldwin et al. 2019); CNPS *Online Inventory* (CNPS 2019); CalFlora (CalFlora 2019) and other sources.
[2] Habitat and elevation range information from CNDDB (CDFW 2019) and CNPS *Online Inventory* (CNPS 2019).
[3] Information on known locations in the vicinity of the BSA was compiled from CNDDB (CDFW 2019), CNPS *Online Inventory* (CNPS 2019), and USFWS (2020).
Low: Habitat within the BSA and/or vicinity satisfies very few of the species' requirements and/or range of the species overlaps with the vicinity of the BSA, but not the BSA itself. The species' presence within the BSA is unlikely.

***Scientific Name*[1] Common Name**	**Listing Status**			**Flowering Period**	**Habitat Preferences and Elevation Range[2]**	**Potential to Occur/Impact to Federal Species/Rational**
	Federal / State / RPR*					
Abronia umbellata var. *breviflora* pink sand-verbena	–	–	1B.1	Jun-Oct	Coastal dunes and scrub. Disturbed sandy areas. Elevation 0–35 feet.	**Not Expected.** No suitable habitat in BSA.
Agrostis blasdalei Blasdale's bent grass	–	–	1B.2	May-Jul	Coastal bluff scrub, coastal dunes, coastal prairie. Gravelly Soils. Elevation 0–490 feet.	**Not Expected.** No suitable habitat in BSA.
Alopecurus aequalis var. *sonomensis* Sonoma alopecurus	FE	–	1B.1	May-Jul	Marshes and swamps (freshwater), riparian scrub. Elevation 15–1,200 feet.	**Not Expected.** No marsh and/or swamp habitat in BSA. **No Effect.**

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Amorpha californica var. *napensis* Napa false indigo	–	–	1B.2	Apr-Jul	Broadleafed upland forest (openings), chaparral, and cismontane woodland. Can occur in wetlands and non-wetlands. Elevation 394–6,562 feet.	**Low.** Limited suitable woodland habitat in the BSA. Species not observed during plant and habitat surveys. Nearest current CNPS occurrence record is approximately 6 miles south at Alpine Lake.
Amsinckia lunaris bent-flowered fiddleneck	–	–	1B.2	Mar-Jun	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland. Elevation 10–1,640 feet.	**Low.** Limited suitable woodland habitat in the BSA. Nearest current CNDDB occurrence is approximately 3.7 miles southeast in the Mount Tamalpais watershed.
Arctostaphylos montana ssp. *montana* Mt. Tamalpais manzanita	–	–	1B.3	Feb-Apr	Serpentinite, rocky. Chaparral and valley and foothill grassland. Elevation 525–2,493 feet.	**Not Expected.** No *Arctostaphylos* species observed in the BSA during rare plant survey on April 21, 2015 and February 25, 2019. No serpentine habitat in the BSA.
Arctostaphylos virgata Marin manzanita	–	–	1B.2	Jan-Mar	Sandstone or granitic. Broadleafed upland forest, closed-cone coniferous forest, chaparral, and North Coast coniferous forest. Elevation 198–2,310 feet.	**Not Expected.** No *Arctostaphylos* species observed in the BSA during rare plant survey on April 21, 2015 and February 25, 2019. No suitable habitat observed in the BSA.
Aspidotis carlotta-halliae Carlotta Hall's lace fern	–	–	4.2	Jan-Dec	Chaparral, cismontane woodland. Usually serpentinite microhabitat. Elevation 325-4595 feet.	**Not Expected.** No serpentine habitat in the BSA.
Astragalus breweri Brewer's milk-vetch	–	–	4.2	Apr-Jun	Chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland (open, often serpentine). Elevation 295-2,395 feet.	**Not Expected.** No suitable habitat in the BSA.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Astragalus pycnostachyus var. *pycnostachyus* coastal marsh milk-vetch	–	–	1B.2	(Apr)Jun-Oct	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, streamsides). Elevation 0-100 feet.	**Not Expected.** No suitable habitat in the BSA.
Calamagrostis crassiglumis Thurber's reed grass	–	–	2B.1	May-Aug	Coastal scrub (mesic), marshes and swamps (freshwater). Elevation 30-195 feet.	**Not Expected.** No suitable habitat in the BSA.
Calamagrostis ophitidis serpentine reed grass	–	–	4.3	Apr-Jul	Chaparral (open, often north-facing slopes), lower montane coniferous forest, meadows and seeps, valley and foothill grassland. Elevation 295-3,495 feet.	**Not Expected.** No suitable habitat in the BSA.
Calochortus umbellatus Oakland star-tulip	–	–	4.2	Mar-May	Often serpentinite. Broadleafed upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland. Elevation 325–2,295 feet.	**Not Expected.** No serpentine habitat in the BSA.
Campanula californica swamp harebell	–	–	1B.2	Jun-Oct	Mesic. Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (freshwater), and North Coast coniferous forest. Elevation 5–1,340 feet.	**Not Expected.** No suitable habitat in the BSA.
Cardamine angulata seaside bittercress	–	–	2B.1	(Jan)Mar-Jul	Wet areas, streambanks. Lower montane coniferous forest and North Coast coniferous forest. Elevation 215–3,020 feet.	**Not Expected.** No coniferous forest in the BSA.
Carex lyngbyei Lyngbye's sedge	–	–	2B.2	Apr-Aug	Marshes and swamps (brackish or freshwater). Elevation 0-35 feet.	**Not Expected.** No suitable habitat in the BSA.
Castilleja affinis ssp. *neglecta* Tiburon paintbrush	FE	ST	1B.2	Apr-Jun	Valley and foothill grassland (serpentinite). Elevation 197–1,312 feet.	**Not Expected.** No serpentine habitat in the BSA. **No Effect.**

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Castilleja ambigua var. *ambigua* johnny-nip	–	–	4.2	Mar-Aug	Coastal bluff scrub, coastal prairie, Coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins. Elevation 0-1,425 feet.	**Not Expected.** No suitable habitat in the BSA.
Castilleja ambigua var. *humboldtiensis* Humboldt Bay owl's-clover	–	–	1B.2	Apr-Aug	Marshes and swamps (coastal salt). Elevation 0–10 feet.	**Not Expected.** No coastal salt marsh in the BSA.
Ceanothus decornutus Nicasio ceanothus	–	–	1B.2	Mar-May	Serpentinite, rock, sometimes clay. Maritime chaparral. Elevation 770–951 feet.	**Not Expected**. No serpentine habitat in the BSA.
Ceanothus gloriosus var. *porrectus* Mt. Vision ceanothus	–	–	1B.3	Feb-May	Closed-cone coniferous forest and coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 80–1,010 feet.	**Not Expected.** No suitable habitat in the BSA.
Ceanothus masonii Mason's ceanothus	–	SR	1B.2	Mar-Apr	Chaparral (openings, rocky, serpentinite). Elevation 760–1,650 feet.	**Not Expected.** No serpentine chaparral habitat in the BSA.
Chloropyron maritimum ssp. *palustre* Point Reyes bird's-beak	–	–	1B.2	Jun-Oct	Marshes and swamps (coastal salt). Elevation 0–35 feet.	**Not Expected.** No coastal salt marsh in the BSA
Chloropyron molle ssp. *mole* soft bird's-beak	FE	SR	1B.2	Jun-Nov	Marshes and swamps (coastal salt). Elevation 0–35 feet.	**Not Expected.** No coastal salt marsh in the BSA **No Effect.**
Chorizanthe cuspidata var. *cuspidate* San Francisco Bay spineflower	–	–	1B.2	Apr-Jul(Aug)	Sandy. Coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub. Elevation 10–710 feet.	**Not Expected.** No suitable habitat in the BSA.
Chorizanthe valida Sonoma spineflower	FE	SE	1B.1	Jun-Aug	Coastal prairie (sandy). Elevation 33–1,000 feet.	**Not Expected.** No coastal prairie habitat in the BSA. **No Effect.**

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Cicuta maculata var. *bolanderi* Bolander's water-hemlock	–	–	2B.1	Jul-Sep	Marshes and swamps and coastal, fresh or brackish water. Elevation 10–660 feet.	**Low.** No marsh and swamp habitat in the BSA. Nearest CNDDB occurrence record is historic, from 1933, and approximately 12 miles north in Tomales Bay State Park.
Cirsium andrewsii Franciscan thistle	–	–	1B.2	Mar-Jul	Mesic, sometimes serpentinite. Broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. Elevation 0–500 feet.	**Not Expected.** No suitable habitat in the BSA.
Cirsium hydrophilum var. *vaseyi* Mt. Tamalpais thistle	–	–	1B.2	May-Aug	Serpentinite seeps. Broadleafed upland forest, chaparral, and meadows and seeps. Elevation 792–2,046 feet.	**Not Expected.** No serpentine seeps in the BSA.
Collinsia corymbosa round-headed Chinese-houses	–	–	1B.2	Apr-Jun	Coastal dunes. Elevation 0–65 feet.	**Not Expected.** No coastal dune habitat in the BSA.
Delphinium bakeri Baker's larkspur	FE	SE	1B.1	Mar-May	Decomposed shale, often mesic. Broadleafed upland forest, coastal scrub, and valley and foothill grassland. Elevation 26–1,010 feet.	**Not Expected.** Currently known from only one small historical occurrence in west Marin County along a steep roadside hill on Marshall-Petaluma Rd. USFWS and U.C. Botanical Garden at Berkeley have reintroduced the species to 3 general locations on private ranches and MMWD land near Soulajule Reservoir (USFWS 2014a). The BSA is out of the species' known range.
						No Effect.
Delphinium luteum golden larkspur	FE	SR	1B.1	Mar-May	Rocky. Chaparral, coastal prairie, and coastal scrub. Elevation 0–330 feet.	**Not Expected.** No suitable habitat in the BSA.
						No Effect.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Dirca occidentalis western leatherwood	–	–	1B.2	Jan-Mar(Apr)	Mesic. Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. Elevation 83–1,043 feet.	**Low.** Limited mesic riparian woodland habitat in the BSA. Although the rare plant survey on April 21 and July 8, 2015 were past the species blooming time of January through March, the perennial shrub was not observed in the BSA. A reference site visit for this species was conducted on February 23, 2015 while flowering and leafing.
Elymus californicus California bottle-brush grass	–	–	4.3	May-Aug	Broadleafed upland forest, cismontane woodland, North Coast coniferous forest, riparian woodland. Elevation 49–1,542 feet.	**Not Expected.** Wasn't detected during rare plant survey and subsequent land cover surveys.
Entosthodon kochii Koch's cord moss	–	–	1B.3	May-Aug(Nov)	Cismontane woodland (soil). Elevation 594–3,300 feet.	**Low.** Limited woodland habitat in the BSA. Only CNDDB occurrence record is undated on Lucas Valley Rd. approximately 3.5 miles north of the BSA.
Erigeron biolettii streamside daisy	–	–	3	Jun-Oct	Rocky, mesic. Broadleafed upland forest, cismontane woodland, and North Coast coniferous forest. Elevation 100–3,630 feet.	**Low.** Limited woodland in the BSA. Nearest CNPS records are from Mt. Burdell Open Space Preserve and surrounding area approximately 7.5 miles northeast of the BSA.
Eriogonum luteolum var. *caninum* Tiburon buckwheat	–	–	1B.2	May-Sep	Serpentinite, sandy to gravelly. Chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland. Elevation 0–2,297 feet.	**Not Expected.** No serpentine habitat in the BSA.
Erysimum concinnum bluff wallflower	–	–	1B.2	Feb-Jul	Coastal bluff scrub, coastal dunes, and coastal prairie. Elevation 0–610 feet.	**Not Expected.** No suitable habitat in the BSA.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Erysimum franciscanum San Francisco wallflower	–	–	4.2	Mar-Jun	Chaparral, coastal dunes, coastal scrub, valley and foothill grassland. Elevation 0-1,805 feet.	**Not Expected.** No suitable habitat in the BSA.
Fissidens pauperculus minute pocket moss	–	–	1B.2		North Coast coniferous forest (damp coastal soil). Elevation 100–3,380 feet.	**Not Expected.** No coniferous forest habitat in the BSA.
Fritillaria lanceolata var. *tristulis* Marin checker lily	–	–	1B.1	Feb-May	Coastal bluff scrub, coastal prairie, and coastal scrub. Elevation 50–495 feet.	**Not Expected.** No suitable habitat in the BSA.
Fritillaria liliacea fragrant fritillary	–	–	1B.2	Feb-Apr	Often serpentinite. Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 10–1,345 feet.	**Low.** Limited woodland habitat in the BSA. Nearest current CNDDB occurrence record is approximately 3.5 miles north of the BSA.
Gilia capitata ssp. *chamissonis* blue coast gilia	–	–	1B.1	Apr-Jul	Coastal dunes and coastal scrub. Elevation 10–660 feet.	**Not Expected.** No suitable habitat in the BSA.
Gilia capitata ssp. *tomentosa* woolly-headed gilia	–	–	1B.1	May-Jul	Serpentinite, rocky, outcrops. Coastal bluff scrub and valley and foothill grassland. Elevation 100–730 feet.	**Not Expected.** No serpentine habitat in the BSA.
Gilia millefoliata dark-eyed gilia	–	–	1B.2	Apr-Jul	Coastal dunes. Elevation 10–100 feet.	**Not Expected.** No coastal dune habitat in the BSA.
Grindelia hirsutula var. *maritima* San Francisco gumplant	–	–	3.2	Jun-Sep	Sandy or serpentinite. Coastal bluff scrub, coastal scrub, and Valley and foothill grassland. Elevation 50–1,320 feet.	**Not Expected.** No suitable habitat in the BSA.
Helianthella castanea Diablo helianthella	–	–	1B.2	Mar-Jun	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Elevation 195-4,265 feet.	**Not Expected.** Limited woodland and no grassland habitat in the BSA.
Hemizonia congesta ssp. *congesta* congested-headed hayfield tarplant	–	–	1B.2	Apr-Nov	Sometimes roadsides. Valley and foothill grassland. Elevation 65–1,837 feet.	**Not Expected.** No grassland habitat in the BSA.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Hesperevax sparsiflora var. *brevifolia* short-leaved evax	–	–	1B.2	Mar-Jun	Coastal bluff scrub (sandy), coastal dunes, coastal prairie. Elevation 0-705 feet.	**Not Expected.** No suitable habitat in the BSA.
Hesperolinon congestum Marin western flax	FT	ST	1B.1	Apr-Jul	Serpentinite. Chaparral and valley and foothill grassland. Elevation 16–1,214 feet.	**Not Expected.** No serpentine or grassland habitat in the BSA. **No Effect.**
Heteranthera dubia water star-grass	–	–	2B.2	Jul-Oct	Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. Elevation 200–4,290 feet.	**Not Expected.** Presume extirpated in Marin County. Nearest current CNDDB occurrence record is approximately 23 miles east of the BSA in Contra Costa County. The only CNDDB occurrence in Marin County is historic (1938).
Holocarpha macradenia Santa Cruz tarplant	FT	SE	1B.1	Jun-Oct	Often clay, sandy. Coastal terrace prairie and grassland. Elevation 100–730 feet.	**Not Expected.** No suitable habitat in the BSA. Natural populations are restricted to coastal terrace prairie habitat within Santa Cruz and Monterey counties. **No Effect.**
Horkelia marinensis Point Reyes horkelia	–	–	1B.2	May-Sep	Sandy. Coastal dunes, coastal prairie, coastal scrub. Elevation 20–2,490 feet.	**Not Expected.** No suitable habitat in the BSA.
Horkelia tenuiloba thin-lobed horkelia	–	–	1B.2	May-Jul(Aug)	Mesic openings, sandy. Broadleafed upland forest, chaparral, and valley and foothill grassland. Elevation 165–1,650 feet.	**Not Expected.** No suitable habitat in the BSA.
Hosackia gracilis harlequin lotus	–	–	4.2	Mar-Jul	Broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, North Coast coniferous forest, valley and foothill grassland. Elevation 0-2,295 feet.	**Not Expected.** Limited woodland habitat and no marsh or grassland habitat present in the BSA.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Hypogymnia schizidiata island rock lichen	–	–	1B.3		Closed-cone coniferous forest, chaparral. Elevation 1,180-1,330 feet.	**Not Expected.** No coniferous forest present in the BSA.
Kopsiopsis hookeri small groundcone	–	–	2B.3	Apr-Aug	North Coast coniferous forest. Elevation 295-2,905 feet.	**Not Expected.** No coniferous forest present in the BSA
Lasthenia californica ssp. *macrantha* perennial goldfields	–	–	1B.2	Jan-Nov	Coastal bluff scrub, coastal dunes, and coastal scrub. Blooms January-November. Elevation 5–520 m	**Not Expected.** No suitable habitat in the BSA.
Lasthenia conjugens Contra Costa goldfields	FE	–	1B.1	Mar-Jun	Mesic. Cismontane woodland, playas (alkaline), valley and foothill grassland, and vernal pools. Elevation 0–1,550 feet.	**Not Expected.** In Marin County, the species is only known to occur in vernal pool habitats. There are no vernal pools in the BSA. **No Effect.**
Layia carnosa beach layia	FE	SE	1B.1	Mar-Jul	Coastal dunes and coastal scrub (sandy). Elevation 0–200 feet.	**Not Expected.** No suitable habitat in the BSA.
Leptosiphon croceus coast yellow leptosiphon	–	SE	1B.1	Apr-Jun	Coastal bluff scrub and coastal prairie. Elevation 100–500 feet.	**Not Expected.** No suitable habitat in the BSA.
Lessingia hololeuca woolly-headed lessingia	–	–	3	Jun-Oct	Clay, serpentinite. Broadleafed upland forest, coastal scrub, lower montane coniferous forest, and valley and foothill grassland. Elevation 50–1,010 feet.	**Not Expected.** No serpentine habitat in the BSA.
Lessingia micradenia var. *micradenia* Tamalpais lessingia	–	–	1B.2	(Jun)Jul-Oct	Usually serpentinite, often roadsides. Chaparral and valley and foothill grassland. Elevation 330–1,650 feet.	**Not Expected.** No suitable habitat in the BSA.
Lilaeopsis masonii Mason's lilaeopsis	–	SR	1B.1	Apr-Nov	Marshes and swamps (brackish or freshwater) and riparian scrub. Elevation 0–35 feet.	**Not Expected.** No suitable habitat in the BSA.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Lilium maritimum coast lily	–	–	1B.1	May-Aug	Sometimes roadside. Broadleafed upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, marshes and swamps (freshwater), and North Coast coniferous forest. Elevation 20–1,570 feet.	**Low.** Limited suitable habitat in the BSA.
Microseris paludosa marsh microseris	–	–	1B.2	Apr-Jun(Jul)	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Elevation 20–990 feet.	**Low.** Limited suitable habitat in the BSA. There are no CNDDB occurrences within 10 miles recorded in the last 75 years.
Monardella sinuata ssp. *nigrescens* northern curly-leaved monardella	–	–	1B.2	(Apr)May-Jul(Aug-Sep)	Sandy. Chaparral (Santa Cruz County), coastal dunes, coastal scrub, lower montane coniferous forest (Santa Cruz County, ponderosa pine sandhills). Elevation 0–990 feet.	**Not Expected.** No suitable habitat in the BSA.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	–	–	1B.1	Apr-Jul	Mesic. Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation 16–5,708 feet.	**Low.** Limited woodland in the BSA. No known CNDDB occurrences within 10 miles of BSA.
Navarretia rosulata Marin County navarretia	–	–	1B.2	May-Jul	Serpentinite, rocky. Closed-cone coniferous forest and chaparral. Elevation 660–2,096 feet.	**Not Expected.** No serpentine habitat in the BSA.
Pentachaeta bellidiflora white-rayed pentachaeta	FE	SE	1B.1	Mar-May	Cismontane woodland and valley and foothill grassland (often serpentinite). Elevation 115–2,045 feet.	**Not Expected.** Presumed extirpated in Marin County. Currently this species is only known from an occurrence east of I-280 into Edgewood Regional Park and a possible occurrence on the west side of Upper Crystal Springs Reservoir, both in San Mateo County (USFWS 2010a). **No Effect.**

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Phacelia insularis var. *continentis* North Coast phacelia	–	–	1B.2	Mar-May	Sandy, sometimes rocky. Coastal bluff scrub and coastal dunes. Elevation 35–560 feet.	**Not Expected.** No suitable habitat in the BSA.
Plagiobothrys glaber hairless popcornflower	–	–	1A	Mar-May	Meadows and seeps (alkaline) and marshes and swamps (coastal salt). Elevation 50–595 feet.	**Not Expected.** No suitable habitat in the BSA.
Pleuropogon hooverianus North Coast semaphore grass	–	ST	1B.1	Apr-Jun	Open areas, mesic. Broadleafed upland forest, meadows and seeps, and North Coast coniferous forest. Elevation 33–2,201 feet.	**Not Expected.** No suitable habitat in the BSA.
Polygonum marinense Marin knotweed	–	–	3.1	(Apr)May-Aug(Oct)	Marshes and swamps (coastal salt or brackish). Elevation 0–33 feet.	**Not Expected.** No coastal salt or brackish marsh habitat in the BSA.
Quercus parvula var. *tamalpaisensis* Tamalpais oak	–	–	1B.3	Mar-Apr	Understory conifer woodland. Elevation 328–2,460 feet.	**Not Expected.** No suitable habitat in the BSA.
Ranunculus lobbii Lobb's aquatic buttercup	–	–	4.2	Feb-May	Mesic. Ponds. Cismontane woodland, North Coast coniferous forest, Valley and foothill grassland, Vernal pools. Elevation 45–1,540 feet	**Not Expected.** No suitable habitat in the BSA.
Sagittaria sanfordii Sanford's arrowhead	–	–	1B.2	May-Oct(Nov)	Pond, ditches, marshes and swamps (assorted shallow freshwater). Elevation 0-2,135 feet.	**Not Expected.** No suitable habitat in the BSA. Only one know occurrence within 10 miles of BSA.
Sidalcea calycosa ssp. *rhizomata* Point Reyes checkerbloom	–	–	1B.2	Apr-Sep	Marshes and swamps (freshwater, near coast). Elevation 10–246 feet.	**Not Expected.** No freshwater marsh and swamp habitat in the BSA.
Sidalcea hickmanii ssp. *viridis* Marin checkerbloom	–	–	1B.1	May-Jun	Chaparral (serpentinite). Elevation 165–1,420 feet.	**Not Expected.** No serpentine chaparral habitat in the BSA.

Scientific Name[1] Common Name	Listing Status Federal / State / RPR*			Flowering Period	Habitat Preferences and Elevation Range[2]	Potential to Occur/Impact to Federal Species/Rational
Stebbinsoseris decipiens Santa Cruz microseris	–	–	1B.2	Apr-May	Open areas, sometimes serpentinite. Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 35–1,650 feet.	**Low.** Limited suitable habitat in the BSA. Nearest current CNDDB occurrence record is approximately 8 miles south on Mt. Tamalpais.
Streptanthus batrachopus Tamalpais jewelflower	–	–	1B.3	Apr-Jul	Serpentinite. Closed-cone coniferous forest and chaparral. Elevation 1,007–2,145 feet.	**Not Expected.** No serpentine habitat in the BSA.
Streptanthus glandulosus ssp. *pulchellus* Mt. Tamalpais bristly jewelflower	–	–	1B.2	May-Jul(Aug)	Serpentinite. Chaparral and valley and foothill grassland. Elevation 495–2,640 feet.	**Not Expected.** No suitable serpentine habitat in the BSA.
Trifolium amoenum two-fork clover	FE	–	1B.1	Apr-Jun	Coastal bluff scrub, valley and foothill grassland (sometimes serpentinite). Elevation 15-1,360 feet.	**Not Expected.** No suitable habitat in the BSA.
Trifolium polyodon Pacific Grove clover	–	SR	1B.1	Apr-Jun(Jul)	Closed-cone coniferous forest, coastal prairie, meadows and seeps, valley and foothill grassland. 15-1,395 feet.	**Not Expected.** No suitable habitat in the BSA.
Triphysaria floribunda San Francisco owl's-clover	–	–	1B.2	Apr-Jun	Usually serpentinite. Coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 100–530 feet.	**Not Expected.** No suitable habitat in the BSA.
Triquetrella californica coastal triquetrella	–	–	1B.2		Soil. Coastal bluff scrub and coastal scrub. Elevation 100–330 feet.	**Not Expected.** No suitable habitat in the BSA.

Appendix D Special-status Wildlife Species Evaluated for Potential to Occur in the BSA

Federal Status Designations:

FE Listed as Endangered under the federal Endangered Species Act
FT Listed as Threatened under the federal Endangered Species Act
FC Candidate for listing under the federal Endangered Species Act
FD Delisted; was formerly listed as Threatened or Endangered
PE Proposed for listing as Endangered
PT Proposed for listing as Threatened

BGEPA Protected under the Bald and Golden Eagle Protection Act
– No federal status

State of California Status Designations:

SE Listed as Endangered under the California Endangered Species Act
ST Listed as Threatened under the California Endangered Species Act
SD Delisted; was formerly listed as Threatened or Endangered
FP Fully Protected Species under California Fish and Game Code
SSC California Department of Fish and Wildlife Species of Special Concern
SC State Candidate for Threatened Species
SA Included on the California Department of Fish and Wildlife's Special Animals List
WL California Department of Fish and Wildlife's Watch List

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
Invertebrates				
Opler's longhorn moth	*Adela oplerella*	– / SA	Found in serpentine soils and grasslands in the vicinity of the San Francisco Bay. Larvae feed on cream cups (*Platystemon californicus*).	**Not Expected.** No serpentine grassland habitat in the BSA.
obscure bumble bee	*Bombus caliginosus*	– / SA	This species inhabits open grassy coastal prairies and Coast Range meadows. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees.	**Not Expected.** No suitable habitat in the BSA.
San Bruno elfin butterfly	*Callophrys mossii bayensis*	FE / SA	Cool, damp, usually north-facing cliffs where their host plant, stonecrop (*Sedum spathulifolium*) occurs. Known locations are limited to San Mateo County.	**Not Expected.** Outside of species host range. **No Effect.**
Marin elfin butterfly	*Callophrys mossii marinensis*	– / SA	Found only in the redwood forest areas of Marin County. Host plant is *Sedum spathulifolium.*	**Not Expected.** No redwood forest habitat within the BSA. Host plant not present in the BSA.

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE / SA	Restricted to the foggy, coastal dunes of the Point Reyes peninsula. Larval food plant thought to be *Viola adunca*.	**Not Expected.** No suitable habitat within the BSA. **No Effect.**
California freshwater shrimp	*Syncaris pacifica*	FE / SE	Occur in low elevation, low gradient streams with complex, undercut banks, exposed roots, and organic debris creating habitat structure and complexity. Endemic to Marin, Napa, and Sonoma counties.	**Low.** Known to occur lower in the Lagunitas Creek watershed, but not known to occur in San Geronimo Creek. Limited suitable habitat is present within the BSA. **No Effect.**
San Francisco Bay Area leaf-cutter bee	*Trachusa gummifera*	– / SA	Habitat unknown. Records exist from Marin County but possibly extirpated.	**Not Expected.** Likely extirpated within Marin County. Last CNDDB sighting was in 1962 and about 4.7 miles southeast of the BSA.
Marin hesperian	*Vespericola marinensis*	– / SA	Spring seeps, streams. Found in moist spots in coastal brushfield and chaparral vegetation.	**Not Expected.** No suitable habitat within the BSA.
Fish				
tidewater goby	*Eucyclogobius newberryi*	FE / SSC	Occur in coastal estuaries and lagoons and transitional delta areas from San Diego County to the Smith River in Del Norte County.	**Not Expected.** Outside of the range of the species. No suitable habitat within the BSA. **No Effect.**
Delta smelt	*Hypomesus transpacificus*	FT/ SE	Found in the Sacramento–San Joaquin River Delta upstream of Suisun Bay. Rarely occur in Carquinez Straight or San Pablo Bay.	**Not Expected.** Outside of the range of the species. No suitable habitat within the BSA. **No Effect.**

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
Tomales roach	*Lavinia symmetricus* ssp. *2*	– / SSC	California roach are found in a wide variety of low- and mid- elevation streams, typically in habitats with moderate gradients. Roach can tolerate wide ranges of temperature and dissolved oxygen. The Tomales roach is a subspecies endemic to the tributaries of Tomales Bay.	**High.** Species was observed within the BSA during the reconnaissance survey.
coho salmon – central California coast ESU	*Oncorhynchus kisutch pop. 4*	FE / SE	Typically found in low- to mid-elevation coastal streams with moderate gradients. Coho spawn in clean, well aerated gravels. Juvenile coho typically rear in freshwater streams, including associated estuaries, for two years before emigrating to the Pacific Ocean to mature. Adult coho return to their natal streams to spawn as three-year-old fish.	**High.** Coho are known to occur in San Geronimo Creek. BSA is within coho critical habitat. **May Affect, Likely to Adversely Affect.**
steelhead – central California coast DPS	*Oncorhynchus mykiss irideus pop. 8*	FT / SA	Steelhead are found in streams with access to the ocean from Southern California to Alaska. They typically can inhabit higher gradient	**High.** Steelhead are known to occur in San Geronimo Creek. BSA is within steelhead critical habitat.

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
			reaches than other anadromous salmonids, and therefore can occur higher in the watershed. Steelhead spawn in clean, well aerated gravels. Juvenile steelhead typically rear in freshwater streams, including associated estuaries, for two years before emigrating to the Pacific Ocean to mature. Adult steelhead may return to their natal streams to spawn after a few months to a few years in saltwater. Unlike most other pacific salmon, steelhead may return to the ocean after spawning and may spawn multiple times. The Central California Coast DPS includes populations from the Russian River south to Aptos Creek, including San Francisco Bay tributaries.	**May Affect, Likely to Adversely Affect.**
Amphibians				
California giant salamander	*Dicamptodon ensatus*	– / SSC	Found in a variety of aquatic habitats including lakes, ponds, rivers, and streams. They prefer fast moving water to slow moving water. Refugia, such as burrows and fallen debris, used for hiding, protection from the sun, and brooding are also a vital characteristic of their habitat.	**High.** Habitat present in BSA and multiple CNDDB occurrences within 2 miles of the Project.

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
foothill yellow-legged frog	*Rana boylii*	– / SSC	Breeds and forages in rocky or cobble-bottomed streams and rivers. Found in a variety of forest, woodland, scrub, riparian, and meadow habitats where suitable streams and rivers are present.	**High.** Habitat present in BSA and multiple CNDDB occurrences from San Geronimo Creek and Lagunitas Creek within 2 miles of the Project.
California red-legged frog	*Rana draytonii*	FT / SSC	Breeds in ponds and pools in slow-moving streams with emergent vegetation; adjacent upland habitats are often used for temporary refuges or dispersal movements.	**Moderate.** Known CNDDB occurrences 2 miles from the BSA. Suitable upland habitat present within and adjacent to the BSA and suitable breeding ponds present within dispersal range. **May Affect, Likely to Adversely Affect.**
Reptiles				
western pond turtle	*Actinemys marmorata*	– / SSC	Occurs in both permanent and seasonal waters, including marshes, streams, rivers, ponds, and lakes. Also found in agricultural irrigation and drainage canals. Favors habitats with large amounts of emergent logs or boulders, where several individuals may congregate to bask.	**Moderate.** Moderate potential to occur in the BSA during upland dispersal from nearby pond and deep-water stream habitats. Some basking habitat upstream of the bridge in the BSA.
green sea turtle	*Chelonia mydas*	FT / SA	Found in shallow waters of lagoons, bays, estuaries, mangroves, eelgrass, and seaweed beds. Prefers shallow, protected water with abundant aquatic vegetation.	**Not Expected.** No suitable habitat present in the BSA. **No Effect.**

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
Birds				
Cooper's hawk	*Accipiter cooperii*	– / SA	Found in woodland, chiefly of open, interrupted or marginal type. Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river floodplains; also, live oaks.	**Moderate.** Suitable nesting and foraging habitat throughout riparian corridor and surrounding forested hillsides.
sharp-shinned hawk	*Accipiter striatus*	– / SA	Nest in dense forest and can be found foraging in interrupted forest/forest edges near open fields as well as at backyard bird feeders when foraging.	**Low.** May occasionally forage within the BSA.
tricolored blackbird	*Agelaius tricolor*	– / ST	Highly colonial species; typically nests in freshwater marshes containing emergent vegetation such as cattail (*Typha* sp.) and bulrush (*Schoenoplectus* sp.), but will also use blackberry thickets and dense patches of ruderal vegetation such as thistles and mustard adjacent to marshes or wetlands.	**Low.** No nesting habitat present, may occasionally forage within BSA.
golden eagle	*Aquila chrysaetos*	– / FP	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas provide good nesting sites.	**Not Expected.** Grassland habitat adjacent to busy road is unlikely to attract foraging by this species. No suitable nesting habitat present in BSA.
oak titmouse	*Baeolophus inornatus*	– / SA	Found in oak woodland by rivers and streams. May also live in open pine or mixed oak-pine forest. Restricted to dry slopes of California, sometimes ranges north to Oregon and south to Baja California.	**High.** Suitable nesting and foraging habitat present in BSA.

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
marbled murrelet	*Brachyramphus marmoratus*	FT / SE	Found on coastal waters, bays, inlets, and among islands. Forages in shallow water. Sometimes found on lakes near coast. Nests on island mountainsides or inland in mature forest.	**Not Expected.** No suitable foraging or nesting habitat present in BSA. **No Effect.**
common yellowthroat	*Geothlypis trichas sinuosa*	– / SSC	Found in open areas with thick, low vegetation. Habitat ranges from marshland and grassland to open pine forest. Breeds mainly in marshes and nests in shrubbery along streams.	**Low.** Some suitable foraging and nesting habitat present in BSA. One CNDDB occurrence 4 miles southwest of BSA.
bald eagle	*Haliaeetus leucocephalus*	– / SE, FP	Winters throughout most of California, usually in association with lakes, reservoirs, and along rivers. Nests are commonly located in the highest branches of tall trees near water and occasionally on cliffs.	**Not Expected.** No suitable foraging or nesting habitat present in BSA.
California black rail	*Laterallus jamaicensis coturniculus*	– / ST, FP	Found in freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Requires water depths of about one inch that does not fluctuate during the year & dense vegetation for nesting habitat.	**Not Expected.** No foraging or nesting habitat present in BSA.
San Pablo song sparrow	*Melospiza melodia samuelis*	– / SSC	Inhabits tidal and muted tidal marshes of San Pablo Bay and the northern reaches of San Francisco Bay.	**Not Expected.** No suitable habitat in BSA.
rufous hummingbird	*Selasphorus rufus*	– / SA	Found by streamsides, forest edges, and mountain meadows. Breeds on forest edges and clearings. Winters in Mexico.	**Moderate.** Suitable foraging habitat present in BSA. Project is outside breeding range.

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
yellow warbler	*Setophaga petechia*	– / SSC	Generally occupy riparian vegetation in close proximity to water along streams and in wet meadows for both foraging and nesting.	**High.** Suitable foraging and nesting habitat present in BSA. Observed during 2019 surveys.
California least tern	*Sterna antillarum browni*	FE / SE, FP	Nest colonially on the ground in sandy or gravelly beaches. Forage over open water in coastal regions, including within San Francisco Bay.	**Not Expected.** No suitable foraging or nesting habitat present in BSA. **No Effect.**
northern spotted owl	*Strix occidentalis caurina*	FT / ST	Nest and roost in forests of dense canopy closure. Prefer old forest stands with multi-layered canopies of several tree species in varying size and age.	**High.** BSA is adjacent to critical habitat. Tree coverage beside Project area not dense or varied but species may forage in the BSA. **May Affect, Not Likely to Adversely Affect.**
Mammals				
pallid bat	*Antrozous pallidus*	– / SSC	Occurs throughout California and most abundant in grasslands, shrublands, and woodlands. Roosts in crevices and cavities of buildings, bridges, tunnels, rocks, cliffs, and trees.	**High.** High potential for foraging only. No suitable day roost habitat in bridge, marginally suitable day roost habitat in surrounding riparian corridor, though no very large trees present within the BSA. Night roost habitat present on bridge, but no evidence of night roosts observed. Suitable foraging habitat present along creek corridor throughout BSA.
Point Reyes mountain beaver	*Aplodontia rufa phaea*	– / SSC	It is only known to occur in western Marin County, almost entirely within Point Reyes National Seashore. Found on cool, moist,	**Not Expected.** No suitable habitat within the BSA. There is a CNDDB occurrence within 2 miles of the BSA,

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
			north-facing slopes in moderately dense coastal scrub.	but this is from MVZ specimens. No beavers were found during surveys in 1981. No extant population is presumed present in this location.
Townsend's big-eared bat	*Corynorhinus townsendii*	– / SSC	Occurs in broadleaved upland forest, chaparral, chenopod scrub, Great Basin grassland, Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, meadow and seeps, Mojavean desert scrub, riparian forest, riparian woodland, Sonoran desert scrub, Sonoran thorn woodland, upper montane coniferous forest, and valley and foothills grassland.	**Moderate.** Known to occur in the region, but species extremely sensitive to disturbance. May roost in bridge interior within the BSA that offers cave-like spaces.
silver-haired bat	*Lasionycteris noctivagans*	– / SA	Occurs in coastal and montane coniferous forests, valley and foothill woodlands, and riparian habitats. Roosts in crevices and cavities in trees.	**Low.** Prefers conifer forests, but may roost in trees within the BSA. Infrequently roosts in bridges.
western red bat	*Lasiurus blossevillii*	– / SSC	Occurs throughout California primarily in riparian and woodland areas. Roosts singly or in small groups in shrub and tree foliage.	**Low.** Potential to forage within the BSA. Marginal roosting habitat present in roadside trees.
hoary bat	*Lasiurus cinereus*	– / SA	Occurs throughout California, primarily in habitat mosaics with cover and open areas or habitat edges for feeding. Roosts singly or in small groups in shrub and tree foliage of riparian, woodland, and forest habitats.	**Low.** Potential to forage within the BSA. Marginal roosting habitat present in roadside trees.

Common Name	Scientific Name	Status (Federal/ State)	Habitat Requirements	Potential to Occur at the Project Site Effect Finding for Federally Listed Species
Yuma myotis	*Myotis yumanesis*	– / SA	Found throughout California in open forests and woodlands near sources of water. Roosts in crevices and cavities of buildings, caves, tunnels, mines, bridges, and trees. Forages primarily over open water.	**Moderate**. Known to occur in the region (museum record). Suitable riparian and woodland habitats within the BSA and likely to roost in bridge interiors within the BSA.
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	– / SSC	Found in forest habitats of moderate canopy and moderate to dense understory. Constructs nests of shredded grass, leaves, and other material. May be limited by availability of nest-building materials.	**Moderate.** May occur in riparian and oak woodland areas throughout the BSA.

Appendix E Tree Survey Data (2015)

Complete list of trees in BSA and identification tag numbers

ID	Species	ID	Species
3161	California bay	3264	Red alder
3226	California bay	3265	Oregon ash
3227	California bay	3266	Bigleaf maple
3228	California bay	3267	California bay
3229	California bay	3268	California bay
3230	California bay	3269	California buckeye
3232	California buckeye	3270	California bay
3233	California bay	3271	Plum
3234	California bay	3272	Coast live oak
3235	California buckeye	3273	Arroyo willow
3236	California bay	3274	California bay
3237	California bay	3275	California buckeye
3238	California bay	3276	California buckeye
3239	California buckeye	3277	California buckeye
3240	California buckeye	3278	Red alder
3241	California buckeye	3279	Oregon ash
3242	California buckeye	3280	California buckeye
3243	California bay	3281	Oregon ash
3244	California buckeye	3282	Bigleaf maple
3245	California buckeye	3283	Oregon ash
3246	California buckeye	3284	Oregon ash
3247	California buckeye	3285	Bigleaf maple
3248	California bay	3286	Bigleaf maple
3249	California buckeye	3287	Oregon ash
3250	California bay	3288	Red alder
3251	California bay	3289	Red alder
3252	California bay	3290	Oregon ash
3253	California bay	3291	Red alder
3254	California bay	3292	Bigleaf maple
3255	California buckeye	3293	California bay
3256	Redwood	3294	California bay
3257	California bay	3295	Oregon ash
3258	California bay	3296	Oregon ash
3259	California buckeye	3297	Bigleaf maple
3260	Bigleaf maple	3298	California bay
3261	California buckeye	3299	California bay
3262	California bay	3300	California bay
3263	California bay		

Appendix F List of Plant Species Observed in the BSA during Protocol-level Surveys (2015)

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
FERNS AND FERN ALLIES		
EQUISETACEAE	HORSETAIL FAMILY	
Equisetum laevigatum	Smooth scouring rush	Maple/Ash; Ash/Alder
DRYOPTERIDACEAE		
Polystichum munitum	Western sword fern	Maple/Ash; Ash/Alder
POLYPODIACEAE	POLYPODY FAMILY	
Polypodium californicum	California polypody	Bay/Buckeye
FLOWERING PLANTS: DICOTS		
ADOXACEAE	MUSKROOT FAMILY	
Sambucus nigra ssp. *caerulea*	Blue elderberry	
ANACARDIACEAE	SUMAC FAMILY	
Toxicodendron diversilobum	Poison oak	Maple/Ash; Bay/Buckeye; Ash/Alder
APIACEAE	CARROT FAMILY	
*Anthriscus caucalis**	Bur-chervil	Maple/Ash; Ash/Alder
Cardamine californica var. *californica*	California toothwort	Maple/Ash; Ash/Alder
Heracleum maximum	Common cowparsnip	Maple/Ash
Hypochaeris radicata	Rough cat's ear	Maple/Ash
Lomatium macrocarpum	Bigseed biscuitroot	Maple/Ash
Oenanthe sarmentosa	Water parsley	Maple/Ash; Ash/Alder
Osmorhiza berteroi	Sweetcicely	Maple/Ash; Ash/Alder
Sanicula crassicaulis	Pacific sanicle	Bay/Buckeye
*Scandix pecten-veneris**	Shepard's needle	Bay/Buckeye
*Torilis arvensis**	Hedge parsley	Maple/Ash
APOCYNACEAE	DOGBANE FAMILY	
*Vinca major**	Greater periwinkle	Maple/Ash; Bay/Buckeye; Ash/Alder
ARALIACEAE	GINGSING FAMILY	
*Hedera helix**	English ivy	Maple/Ash; Bay/Buckeye; Ash/Alder
*Hedera canariensis**	Algerian ivy	Maple/Ash; Bay/Buckeye; Ash/Alder
ASTERACEAE	SUNFLOWER FAMILY	
Artemisia douglasiana	Mugwort	Maple/Ash
Baccharis pilularis	Coyote brush	Bay/Buckeye
*Carduus pycnocephalus**	Italian thistle	Maple/Ash; Bay/Buckeye; Ash/Alder
BETULACEAE	BEECH FAMILY	

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
Alnus rubra	Red alder	Maple/Ash; Ash/Alder
Corylus cornuta subsp. c*alifornica*	California hazel	Ash/Alder
BORAGINACEAE	BORAGE FAMILY	
*Myosotis latifolia**	Forget me not	Maple/Ash; Ash/Alder
CALYCANTHACEAE	CALYCANTHUS FAMILY	
Calycanthus occidentalis	Spicebush	Bay/Buckeye
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY	
Lonicera hispidula	Pink honeysuckle	Maple/Ash; Ash/Alder
Symphoricarpos albus	Snowberry	Maple/Ash; Bay/Buckeye; Ash/Alder
CARYOPHYLLACEAE	PINK FAMILY	
*Stellaria media**	Common chickweed	Maple/Ash; Ash/Alder
CORNACEAE	DOGWOOD FAMILY	
Cornus sericea ssp. *occidentalis*	Dogwood	Ash/Alder
CUCURBITACEAE	GOURD FAMILY	
Marah fabaceus	California manroot	Maple/Ash; Ash/Alder
FABACEAE	PEA FAMILY	
*Genista monspessulana**	French broom	Maple/Ash; Ash/Alder
FAGACEAE	OAK FAMILY	
Quercus agrifolia	Coast live oak	Maple/Ash
GERANIACEAE	GERANIUM FAMILY	
*Geranium dissectum**	Cut-leaf geranium	Maple/Ash; Ash/Alder
*Geranium robertianum**	Robert geranium	Maple/Ash; Ash/Alder
GROSSULARIACEAE	GOOSEBERRY FAMILY	
Ribes sp.	Gooseberry	Maple/Ash
LAMIACEAE	MINT FAMILY	
Clinopodium douglasii	Yerba buena	Maple/Ash; Ash/Alder
Stachys ajugoides	Hedgenettle	Maple/Ash; Ash/Alder
Prunella vulgaris var. *lanceolata*	Mountain Selfheal	Maple/Ash
LAURACEAE	LAUREL FAMILY	
Umbellularia californica	California bay	Maple/Ash; Ash/Alder
MONTIACEAE	MINER'S LETTUCE FAMILY	
Claytonia perfoliata	Miner's lettuce	Maple/Ash; Ash/Alder

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
MYRSINACEAE	MYRSINE FAMILY	
*Anagallis arvensis**	Scarlet pimpernel	Maple/Bay
OLEACEAE		
Fraxinus latifolia	Oregon ash	Maple/Ash; Ash/Alder
POLYGONACEAE	BUCKWHEAT FAMILY	
*Rumex pulcher**	Fiddle dock	Ash/Alder
ROSACEAE	ROSE FAMILY	
Prunus sp.*	Plum	Maple/Ash
Rosa californica	California rose	Ash/Alder
*Rubus armeniacus**	Himalayan blackberry	Maple/Ash; Ash/Alder
Rubus parviflorus	Thimbleberry	Ash/Alder
Rubus ursinus	California blackberry	Maple/Ash; Ash/Alder
RUBIACEAE	MADDER FAMILY	
*Sherardia arvensis**	Field madder	Maple/Ash
SALICACEAE	WILLOW FAMILY	
Salix lasiolepis	Arroyo willow	Maple/Ash
SAPINDACEAE	SOAPBERRY FAMILY	
Acer macrophyllum	Bigleaf maple	Maple/Ash; Ash/Alder
Aesculus californica	California buckeye	Maple/Ash; Bay/Buckeye; Ash/Alder
URTICACEAE	NETTLE FAMILY	
Urtica dioica	Stinging nettle	Maple/Ash; Ash/Alder
FLOWERING PLANTS: MONOCOTS		
CYPERACEAE	SEDGE FAMILY	
Carex leptopoda	Slender-footed sedge	Maple/Ash; Ash/Alder
Carex nudata	Torrent sedge	Maple/Ash; Ash/Alder
Scirpus microcarpus	Panicled bulrush	Maple/Ash
LILIACEAE	LILY FAMILY	
*Allium neapolitanum**	White garlic	Maple/Ash
POACEAE	GRASS FAMILY	
*Avena barbata**	Slender wild oat	Maple/Ash; Ash/Alder
*Bromus diandrus**	Ripgut brome	Maple/Ash; Ash/Alder
Bromus carinatus	California brome	Maple/Ash
*Bromus hordeaceus**	Soft chess	Ash/Alder

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
*Cynosurus echinatus**	Spiny dogtail	Ash/Alder
*Dactylis glomerata**	Orchardgrass	Ash/Alder
*Ehrharta erecta**	Panic veldtgrass	Maple/Ash; Ash/Alder
Elymus glaucus	Beardless wildrye	Maple/Ash; Ash/Alder
*Festuca perennis**	Italian ryegrass	Ash/Alder
*Holcus lanatus**	Velvet grass	Maple/Ash
*Holcus mollis**	Creeping velvetgrass	Maple/Ash
Melica californica	California melic grass	Maple/Ash
*Poa annua**	Blue grass	Maple/Ash
THEMIDACEAE	BRODIAEA FAMILY	
Triteleia laxa	Ithuriel's spear	

Notes:

1. Common and scientific names from Baldwin et al. (2012) and CalFlora (2015)

2. Maple/Ash = Bigleaf maple / Oregon ash forest; Bay/Buckeye = California bay forest / California buckeye groves; Bay = California bay forest; and Ash/Alder = Oregon ash forest / Red alder forest

* = non-native species

Appendix G Aquatic Resource Delineation

Delineation of Aquatic Resources

Mountain View Road Bridge Replacement Project

Caltrans District 04
Marin County
Mountain View Road
Federal Project No. BRLO-5927 (094)

June 2019

Prepared for:

COUNTY OF MARIN

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Prepared By:

GANDA

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Summary

The County of Marin proposes to replace the existing 51-foot long, 11-foot wide San Geronimo Creek Bridge (Bridge No. 27C0154) with a new structure accommodating one 12-foot lane with two-foot shoulders and bridge railings. The new bridge will be a 70-foot long, single-span, precast, prestressed concrete slab unit bridge. The alignment will shift by approximately seven feet to the east. The existing San Geronimo Creek Bridge, constructed in 1962, is a three-span steel railroad car frame structure with timber deck runners. The existing bridge has been given a sufficiency rating of 59.0 and a status of functionally obsolete. The proposed action will take place in Marin County, CA, along Mountain View Road just off of Sir Francis Drake Boulevard in the community of Lagunitas/Forest Knolls.

This investigation followed the methods described in the *Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987), supplemented with guidance as directed by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and *Regulatory Guidance Letter Subject: Ordinary High Water Mark Identification* (USACE 2005).

Garcia and Associates botanist Constance Ganong and biologist Rebecca Doubledee first conducted field investigations on April 21, 2015 to delineate potential waters of the U.S., including wetlands and water features in the biological study area, which totals 2.31 acres. Subsequently in 2018, design changes were made to the bridge resulting in an increase in the biological study area. On February 25, 2019, Constance Ganong and Garcia and Associates biologists Nate Vorapharuek and Karla Marlow surveyed new Project areas and conducted verification surveys of the 2015 biological and aquatic surveys. The biological study area is illustrated in Figures 1 and 2 and Appendix A.

A preliminary evaluation of jurisdiction is presented in this report. The entire 0.207 acre of potential waters of the U.S. delineated within the biological study area is proposed to be jurisdictional. No wetlands were identified within the biological study area. Other waters included a perennial creek, which totaled approximately 0.199 acre, and ephemeral drainages, which totaled approximately 0.008 acre. These aquatic features are illustrated in Appendix A and summarized in Table 4-1. Representative photographs of the biological study area are included in Appendix C. The Aquatic Resource Spreadsheet is included in Appendix D.

List of Abbreviated Terms

Abbreviation	Definition
BSA	Biological study area
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CIDH	Cast-in-drilled-hole
CWA	Clean Water Act
ED	Ephemeral drainage
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GPS	Global Positioning System
MALT	Marin Agricultural Land Trust
NL	Not Listed
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate
OHWM	Ordinary high water mark
OWUS	Other waters of the U.S.
PC	Perennial creek
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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1.0 INTRODUCTION

The County of Marin (County) proposes to replace the existing 51-foot long, 11-foot wide San Geronimo Creek Bridge (Bridge No. 27C0154) with a new structure accommodating one 12-foot lane with two-foot shoulders and bridge railings. The new bridge will be a 70-foot long, single-span, precast, prestressed concrete slab unit bridge. The alignment will shift by approximately seven feet to the east. The existing San Geronimo Creek Bridge, constructed in 1962, is a three-span steel railroad car frame structure with timber deck runners. The existing bridge has been given a sufficiency rating of 59.0 and a status of functionally obsolete. The proposed action will take place in Marin County, CA, along Mountain View Road just off of Sir Francis Drake Boulevard in the community of Lagunitas/Forest Knolls.

The roadway and bridge profile will be raised approximately four feet to clear the 100-year flood elevation. The southern roadway approach work will extend 60 feet down Corona Avenue east, 25 feet down Corona Avenue south, 95 feet down Mountain View Road, and 115 feet down a private driveway. The roadway cross-section will consist of a single lane varying in width from 9 to 12 feet, consistent with existing Mountain View Road and Corona Avenue roadway widths.

On the north, the roadway approach work will extend into the Mountain View Road and Sir Francis Drake Boulevard intersection, raising the center of the intersection by two feet. The roadway approach work will extend 440 feet along Sir Francis Drake Boulevard (238 feet to the west and 202 feet to the east). The roadway cross-section along Sir Francis Drake Boulevard will consist of 12-foot lanes, and varying shoulder widths to match existing conditions.

A temporary shift in the alignment along Sir Francis Drake Boulevard is expected in order to provide contractor staging areas along the south shoulder of Sir Francis Drake Boulevard near the project site. The shift is anticipated to be approximately six feet to the north extending 300 to 400 feet in both directions, with temporary k-railing running along the south shoulder to separate the staging area from traffic.

Removal and relocation of overhead and underground utilities is anticipated as part of the project. The waterline that is mounted to the east side of the existing structure will be relocated to the new structure, and an existing storm drain culvert running east under Corona Avenue will be replaced. The fire hydrant located off the southeast corner of the bridge; two utility poles, one to the northeast and one to the southeast of the existing bridge; and the overhead utilities supported by the utility poles will be removed. These utilities

will be relocated within the project area as part of a separate project.

Construction of the bridge will involve excavation for and construction of concrete abutments supported on cast-in-drilled-hole (CIDH) piles. The new abutments will be constructed behind the existing abutments and this work will occur outside of the creek. Construction of the roadway approaches will involve the removal of existing pavement and the placement of fill material, aggregate base and hot mix asphalt pavement. Tree removal and the removal of other vegetation along the creek banks will be necessary for the project. Temporary work within San Geronimo Creek is anticipated to include removal of the existing bridge, the old abutments and related piers, and grouted riprap; and installation of scour countermeasures and construction of retaining walls along the top of south creek bank. Temporary creek diversion is anticipated in order to complete activities within the waterway. The temporary creek diversion would only occur during the period of low flow, from June 15 to October 15. Total bridge construction, including work both within and outside of the waterway, is anticipated to have a duration of six months, and construction is expected to begin in Spring 2021.

The project improvements will remain within the County's right-of-way and permanent right-of-way acquisitions are not anticipated. Temporary construction easements will be required from several parcels in order to reconstruct driveways, provide access to the creek and provide adequate storage and staging areas. A review of the Marin Agricultural Land Trust (MALT) map shows that there are no MALT conservation easements on the properties directly adjacent to the project site.

As is standard with all roadway projects, the contractor will be required to install temporary Best Management Practices (BMPs) to control any runoff or erosion from the project site into any nearby waterways, in this case, San Geronimo Creek. These temporary BMPs will be installed prior to any construction operations and will be in place for the duration of the contract. The removal of these BMPs will be the final operation, along with the project site cleanup.

CONSTRUCTION STAGING AND ACCESS:

There are two access points to the residential community on the south side of San Geronimo Creek; one is at Mountain View Road and another is just downstream along Lagunitas Road. Road closure of Mountain View Road across the creek is expected in order to expedite construction of the replacement bridge and roadway approach work. Access on the south side of the creek along Mountain View Road and Corona Avenue will be maintained throughout construction. However, there may be limited timeframes where

access to residential properties will be restricted to facilitate raising the profile and constructing driveway conforms.

2.0 ENVIRONMENTAL SETTING

2.1. Location

The project is located in Marin County, CA, along Mountain View Road just off of Sir Francis Drake Boulevard in the community of Lagunitas/Forest Knolls (Figures 1 and 2). Mountain View Road is a rural, paved one-lane roadway that provides access to several residential properties on the south side of San Geronimo Creek. On the south side of San Geronimo Creek, Mountain View Road and Corona Avenue are part of a Private Road District. The work will be conducted primarily on Mountain View Road and the bridge (latitude 38.012870, longitude -122.699467). The project is within the *San Geronimo* U.S. Geological Survey (USGS) 7.5-minute quadrangle in Township 2 North, Range 8 West, and Section 14.

To access the project, take Sir Francis Drake Boulevard east from California State Route 1 and then take a right onto Mountain View Road. Alternately, take Sir Francis Drake Boulevard west from U.S. Route 101 for approximately 14.5 miles and turn left onto Mountain View Road.

2.2. Biological Study Area

The biological study area (BSA) is the area that the proposed project's activities may directly or indirectly affect. The BSA for this project includes all areas where project activity will occur and adjacent sensitive habitat. The estimated BSA is approximately 2.31 acres (Figures 1 and 2). The BSA is composed mostly of paved Sir Francis Drake Boulevard, dense riparian overstory and the open water channel of San Geronimo Creek. The area is rural and surrounded by residential housing. The BSA is located within the San Geronimo Creek watershed. San Geronimo Creek runs east to west through the BSA. There is also a small unnamed drainage that runs south to north, flowing into San Geronimo Creek, in the southeast corner of the BSA. The San Geronimo Creek watershed is part of the larger Lagunitas Creek Watershed, which flows into Tomales Bay.

2.3. Vegetation Types

Five terrestrial vegetation types were identified within the 2.31 acres of the BSA. Where possible, the classification of vegetation used in this report is based *A Manual of California Vegetation*, *Second Edition* (Sawyer et. al. 2009). The vegetation types are described below.

2.3.1. California Bay Forest: *Umbellularia californica* Forest Alliance

California bay (*Umbellularia californica*) is an evergreen broadleaf tree that grows to approximately 80 feet in height. Stands occur near the coast and inland in both mesic and riparian settings, usually in a patchwork with stands of other evergreen forest or chaparral alliances. In many cases, California bay is the only tree species in older stands with few shrubs and herbs present.

2.3.2. California Bay Forest: *Umbellularia californica* Forest Alliance and California Buckeye Groves: *Aesculus californica* Woodland Alliance

California buckeye (*Aesculus californica*) is a large shrub or tree that may grow to approximately 25 feet tall. California buckeye inhabits varied slopes and topography and is generally found in soils that are shallow and moderately to excessively drained.

Within the BSA, California bay forest and California buckeye groves occur together as dominate species across the Mountain View Road Bridge and partially covers the roadway and the small, unnamed intermittent creek that flows to San Geronimo Creek.

2.3.3. Oregon Ash Forest: *Fraxinus latifolia* Forest Alliance and Red Alder Grove: *Alnus rubra* Forest Alliance

Oregon ash (*Fraxinus latifolia*) is a deciduous hardwood that may attain a height of approximately 80 feet and an age of 250 years. Oregon ash habitat includes riparian corridors, incised canyons, seeps, stream banks, and terraces.

Red alder (*Alnus rubra*) is a deciduous hardwood that may attain a height of 130 feet and an age of 100 years. Red alder stands primarily occur near the coast in California as both riparian and upland stands. Its habitats include stream and river backwaters, banks, bottoms, floodplains, mouths, terraces, and slopes of all aspects.

Within the BSA, Oregon ash and red alder occur together as dominates along San Geronimo Creek west of Mountain View Road Bridge. Other species that occur west of the bridge within the BSA include bigleaf maple (*Acer macrophyllum*) and California bay (*Umbellularia californica)*.

2.3.4. Bigleaf Maple: *Acer macrophyllum* Forest Alliance and Oregon Ash Forest: *Fraxinus latifolia* Forest Alliance

Bigleaf maple is a deciduous hardwood that grows up to 70 feet in height and lives to 300 years. It occurs in habitats with different moisture regimes from moist stream terraces to dry talus, but attains its best development on deep alluvial soils. The best developed stands are scattered along alluvial terraces, in adjacent side drainages, and at springs along seeps.

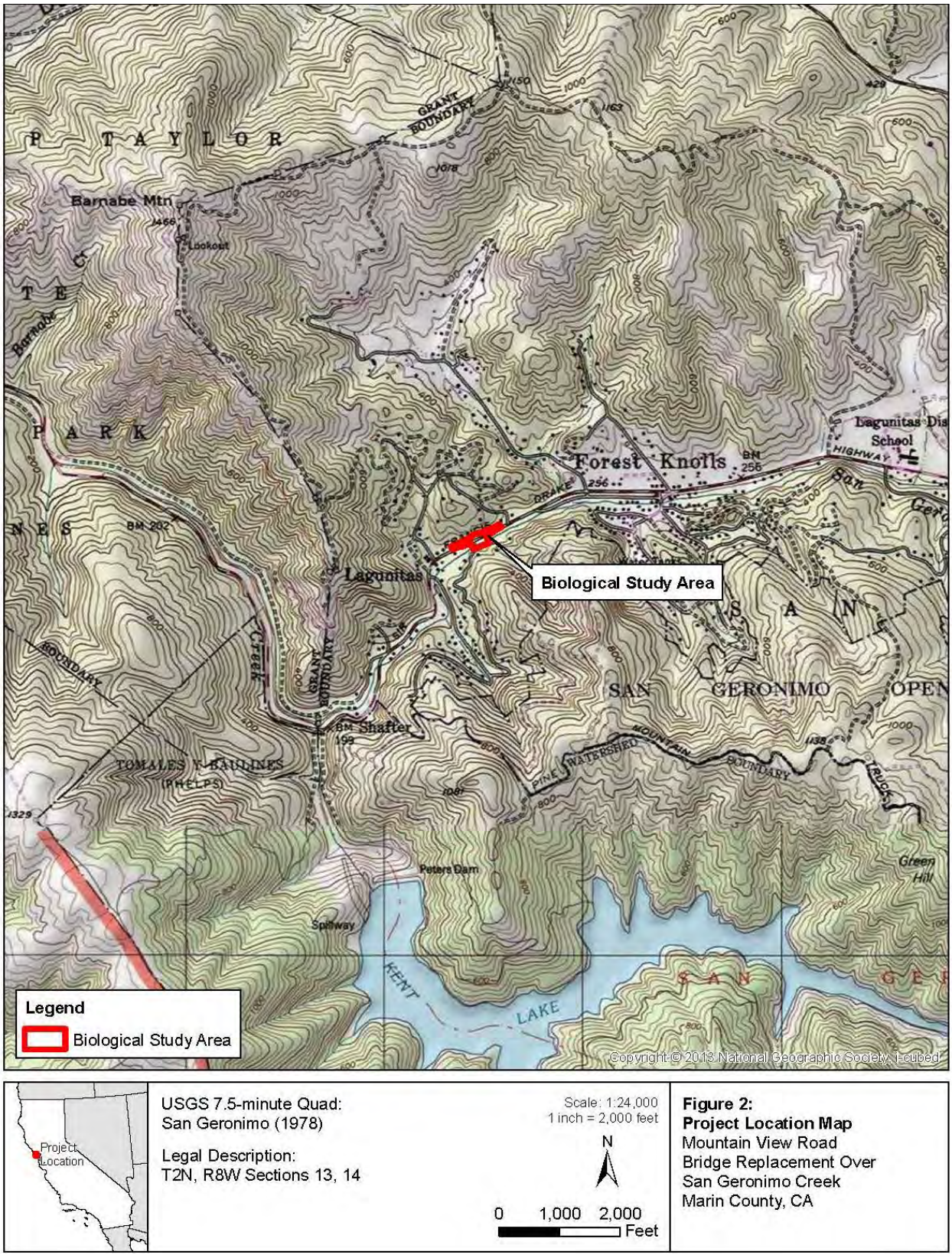
Within the BSA, bigleaf maple and Oregon ash occur together as dominates along San Geronimo Creek east of Mountain View Road Bridge. Other species that occur east of the bridge within the BSA include red alder and California buckeye.

2.3.5. Landscaped/ruderal

Landscaped/ruderal areas have been impacted by grading, mowing, filling, and residential and commercial use. Monterey pine (*Pinus radiata*), incense cedar (*Calocedrus decurrens*) and deodar cedar (*Cedrus deodara*) are planted along Sir Francis Drake Boulevard, opposite the bridge, east of the residential driveway within the BSA. Ruderal vegetation such as non-native, invasive forbs and grasses occur within this area of the BSA as well. Ruderal vegetation is roadside or trailside vegetation composed primarily of weedy, non-native plants, such as poison hemlock (*Conium maculatum*), wild fennel (*Foeniculum vulgare*), Italian thistle (*Carduus pycnocephalus*), and wild oats (*Avena* spp.). It also occurs within and adjacent to landscaped areas. Ruderal vegetation is not a natural vegetation type, and there is no equivalent alliance in *A Manual of California Vegetation* (Sawyer et. al. 2009).

Figure 1. Project Locality

Figure 2. Project Location



3.0 APPLIED METHODS

This investigation followed the methods described in the *Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987), supplemented with guidance as directed by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008), and *Regulatory Guidance Letter Subject: Ordinary High Water Mark Identification* (USACE 2005).

These methods included a preliminary review of available information and on-site field inspections of the study areas to determine the presence or absence of 1) hydrophytic vegetation, 2) hydric soils, and 3) wetland hydrology. Sample points are assessed at paired plots on either side of the lateral edge of sampled wetlands to record the vegetation, soils, and hydrology present. Areas with a dominance or prevalence of hydric vegetation, hydric soil, and wetland hydrology indicators would be mapped as wetlands. At the lateral edges of San Geronimo, features with an ordinary high water mark (OHWM) were mapped as water features. The following discussion describes how these methods and related reference materials were applied to the on-site features.

3.1. Preliminary Data Gathering and Review of Existing Materials

Prior to field investigations, available aerial imagery, topographical maps, and soil maps of the BSA were reviewed to characterize the vegetation, soils, topography, and hydrology in the area. Existing materials reviewed included geospatial wetlands information provided online by the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS 2019) and aerial photography of the study area and vicinity. The Newark, California USGS 7.5-minute topographic quadrangle was also reviewed (USGS 2019).

Soil types in the BSA were identified using the Web Soil Survey, a resource provided by the Natural Resources Conservation Service (NRCS) (2019). The following soil units were identified within the BSA (see Appendix B Soil Report for soil description and mapping):

- Ballard gravelly, loam 2 to 9 percent slopes (101)
- Dipsea-Barnabe very gravely loams, 50 to 75 percent slopes (120)

3.2. Field Investigation

Field investigations to delineate the location and extent of aquatic resources within the 2.31 acres of the BSA were first conducted by Garcia and Associates (GANDA) botanist Constance Ganong and biologist Rebecca Doubledee on April 21, 2015. Subsequently in 2018, changes were made to the bridge design resulting in an increase in the BSA. On February 25, 2019, Constance Ganong and GANDA biologists Nate Vorapharuek and Karla Marlow surveyed new Project areas and conducted verification surveys of the 2015 biological and aquatic surveys. Aquatic features were mapped based on the OHWM within the accessible areas of the channels. Potential waters of the U.S. were mapped in the field using a Trimble Global Positioning System (GPS) survey unit capable of sub-meter accuracy. OHWM and average width of the water channels are mapped in Appendix A. Representative photographs of the BSA and water features are included as Appendix C.

3.3. Mapping of Wetlands

3.3.1. Vegetation

Wetland vegetation was identified in the field based on species composition and corresponding wetland indicator status.

The percent cover of each plant species in the field was visually estimated. The "50/20" rule was used to select dominant species from each stratum (tree, shrub, and herb) of the community, as defined in the *Arid West Regional Supplement* (USACE 2008). Plants were identified according to *The Jepson Manual, Vascular Plants of California, Second Edition* (Baldwin et. al. eds, 2012). The indicator status of each species was determined based on *The National Wetland Plant List: 2016 wetland ratings* (Lichvar et. al. 2016). Vegetation was considered hydrophytic if more than 50 percent of the dominant species from all strata were obligate wetland, facultative wetland, or facultative and the Prevalence Index was 3.0 or less.

Wetland indicator species include those listed as obligate (OBL), facultative wetland (FACW), or facultative (FAC) in the *National List* for the Arid West Region. Upland indicator categories include facultative upland (FACU), or upland (UPL). Plants that are not found in the *National List* are designated Not Listed (NL). Wetland indicator status categories are described in Table 3-1.

Table 3-1. Wetland Indicator Categories

Indicator Category	Wetland Occurrence
Obligate wetland species (OBL)	Occurs almost always in wetlands (estimated >99% probability of occurring in a wetland)
Facultative wetland species (FACW)	Usually occurs in a wetland (estimated 67-99% probability of occurring in a wetland)
Facultative species (FAC)	Equally likely to occur in a wetland or a non-wetland (estimated 33-67% probability of occurring in a wetland)
Facultative upland species (FACU)	Usually occurs in non-wetlands (estimated 1-33% probability of occurring in a wetland)
Obligate upland species (UPL)	Occurs in wetlands in another region, but occurs almost always under natural conditions in non-wetlands in Region O (California) (estimated <1% probability of occurring in a wetland). Plants not listed in Reed 1988 are assumed to be obligate upland species (UPL)
Source: Reed 1988	

3.3.2. Hydrology

Hydrology was characterized in the field using the methods provided in the *Arid West Supplement* (USACE 2008). This investigation relied largely on direct indicators of wetland hydrology. These included surface water, high water table, saturated soils, and water-stained leaves at the wetland features.

3.3.3. Soils

Soils were characterized in the field using the methods provided in the *Arid West Supplement* (USACE 2008). At each sample point, a soil pit was excavated. The determination of whether soils were hydric was based on hydric soil indicators, which are a function of soil texture, matrix color, and/or the presence of other hydric soil indicators. Soil colors were classified according to the *Munsell Soil Color Charts* (Munsell 2000).

3.4. Mapping of Other Waters

The lateral edges of San Geronimo Creek were mapped at the locations of the OHWM. The OHWM is defined as "...the line on the [watercourse banks] established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other appropriate means that consider the characteristics of the surrounding areas" (33 Code of Federal Regulations [CFR] 328).

The location of the OHWM for non-tidal water bodies under the CWA includes evaluating physical characteristics of the area that are determined to be reliable indications of the OHWM (USACE 2005). Physical evidence to be evaluated includes those items listed in 33 CFR 329.11 (a)(1) including, but not limited to:

- Natural line impressed on bank
- Shelving
- Changes in the character of soil
- Destruction of terrestrial vegetation
- Presence of litter and debris
- Wracking
- Vegetation matted down, bent, or absent
- Change in plant community
- Sediment sorting
- Leaf litter disturbed or washed away
- Scour
- Deposition
- Multiple observed flow events
- Bed and bank
- Water staining

4.0 RESULTS

The BSA does not include wetlands but does include "other waters" subject to USACE jurisdiction under Section 404 regulations. Approximately 0.207 acre of potential jurisdictional Section 404 waters were delineated within the 2.31 acres of the BSA. These features are illustrated in Appendix A and summarized in Table 4-1. Representative photographs are included in Appendix C.

The following section describes wetland and water feature types that were observed within the BSA.

4.1. Wetland Features

There were no wetland features identified within the BSA. San Geronimo Creek flows through relatively steep banks with rocky terraces within the BSA (Photos 1 and 2). Soil pits were not considered since jurisdictional status was not in question. The soils in the BSA are Dipsea-Barnabe very gravelly loams, 50 to 75 percent slopes. This type of soil is on uplands and not considered hydric. The native vegetation is mainly mixed hardwoods and conifers on the Dipsea soils and annual grasses, forbs, and brush on Barnabe soils (Kashiwagi 1985). This unit is 50 percent Dipsea very gravelly loam and 20 percent Barnabe gravelly loam. Both are well drained soils and formed in material derived from sandstone or shale (Kashiwagi 1985).

The vegetation within the BSA is sparse understory with dense riparian overstory trees including bigleaf maple (FAC), California buckeye (NL), California bay (FAC), coast live oak (NL), Oregon ash (FACW), and red alder (NL) (Photo 3). These trees are growing up against and along the steep creek banks. Understory vegetation include a mix of non-native and native grasses, shrubs, and forbs: (*Avena* spp.; UPL or NL), ripgut brome (*Bromus diandrus;* NL), Italian rye grass (*Festuca pernennis*; FAC), California melic grass (*Melica californica;* NL), Himalayan blackberry (*Rubus armeniacus*; FAC), California blackberry (*Rubus ursinus;* FAC), French broom (*Genista monspesulana*; NL), periwinkle (*Vinca major*; NL), English ivy (*Hedera helix*:FACU), chickweed (*Stellaria media*; FACU), field madder (*Sherardia arvensis;* NL), Italian thistle (*Carduus pycnocephalus;* NL), yerba buena (*Clinopodium douglasii;* FACU), water parsley (*Oenanthe sarmentosa;* OBL), and torrent sedge (*Carex nudata;* FACW).

Although bigleaf maple, California bay, and Oregon ash are considered hydrophytic species, riparian trees are known to use deep rooting system to access water deep in the ground, and are not a reliable indicator of wetland conditions. The herbaceous layer is

typically more indicative of surface wetland conditions, and in this case is dominated by upland species, many of them invasive species.

4.2. Other Waters of the U.S.

4.2.1. Perennial Creek (PC-1)

San Geronimo Creek is mapped as Other Waters of the U.S. (OWUS; PC-1) and is approximately 0.199 acre and 282 feet long and 31 feet wide within the BSA. The OHWM of San Geronimo Creek within the BSA was identified by field indicators which included the following (Photos 4-6):

- Bed and bank,
- Shelving,
- Break in the bank slope,
- Water staining,
- Change in plant community,
- Scour, and
- Natural line impressed on bank.

Much of the creek within the BSA is within steep banks. During the field visit on April 21, 2015, OHWM was delineated with the Trimble GPS in accessible areas adjacent to and under the bridge. The north bank on the west side of the bridge was not accessible because of heavy blackberry. At the accessible areas, the width of the creek was measured with a tape measure across the creek to get the approximate width for areas up and down stream that were not foot accessible. For example, the north bank on the west side of the bridge was not accessible because of heavy blackberry. During the field visit on February 25, 2019, it was raining and the creek was running high. Attempts to determine the location of creek edge were not done because of safety on the steep slopes.

4.2.2. Ephemeral Drainage (ED-1)

Other waters included the one ephemeral drainage (ED-1) that flowed south to north through a culvert beneath Corona Avenue to San Geronimo Creek. This ephemeral drainage originates in the mountain hillside south of the project. ED-1 is approximately 0.008 acre and 5 feet wide (Photos 7 and 8).

Table 4-1. Summary of Acreage of Aquatic Resources within the 2.31 acres of the BSA (see Appendix D)

Aquatic Resource Name	Location (Latitude/Longitude)	Area (Acres)	Linear Feet
Other Waters of the U.S.			
PC-1	38.012870, -122.699467	0.199	282
ED-1	38.012745, -122.699180	0.008	75
	Total	**0.207**	**357**

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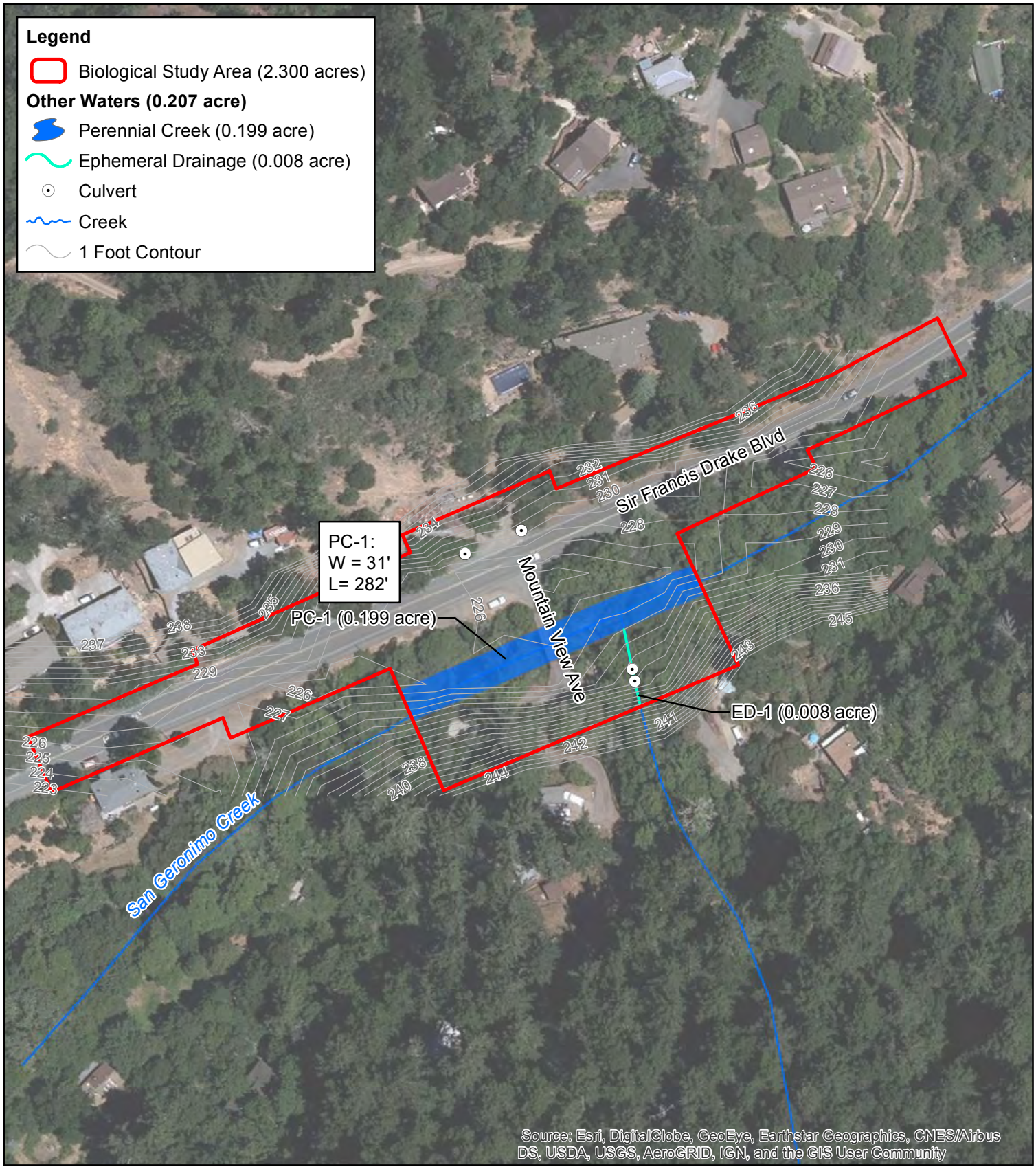
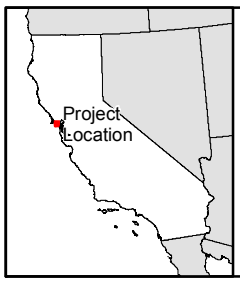
Appendix A:
Aquatic Resources Delineation Map





N

Scale 1:1,400
1 Inch = 117 Feet

0 10 20
Meters
0 50 100
Feet

Appendix A:
Aquatic Resources Delineation Map
Mountain View Road Bridge Replacement Over San Geronimo Creek
Marin County, CA

Appendix B:
Custom Soil Resource Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Marin County, California

March 14, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (Mtn View Rd Bridge)

Map Scale: 1:1,390 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Marin County, California
Survey Area Data: Version 12, Sep 17, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Oct 31, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (Mtn View Rd Bridge)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
101	Ballard gravelly, loam 2 to 9 percent slopes	0.5	17.8%
120	Dipsea-Barnabe very gravelly loams, 50 to 75 percent slopes	2.1	80.2%
179	Tocaloma-McMullin complex, 30 to 50 percent slopes	0.1	1.9%
Totals for Area of Interest		**2.6**	**100.0%**

Map Unit Descriptions (Mtn View Rd Bridge)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Marin County, California

101—Ballard gravelly, loam 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hf14
Elevation: 10 to 300 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 61 to 64 degrees F
Frost-free period: 230 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ballard and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ballard

Setting

Landform: Alluvial fans, fan terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from shale, sandstone and/or granite

Typical profile

H1 - 0 to 19 inches: gravelly loam
H2 - 19 to 65 inches: gravelly clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: LOAMY BOTTOMLAND - (1980) (R014XC008CA)
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 5 percent
Hydric soil rating: No

Clear lake

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Cortina

Percent of map unit: 5 percent
Hydric soil rating: No

120—Dipsea-Barnabe very gravelly loams, 50 to 75 percent slopes

Map Unit Setting

National map unit symbol: hf1r
Elevation: 500 to 1,700 feet
Mean annual precipitation: 30 to 50 inches
Mean annual air temperature: 52 to 55 degrees F
Frost-free period: 275 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Dipsea and similar soils: 50 percent
Barnabe and similar soils: 20 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Dipsea

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from sandstone and shale

Typical profile

H1 - 0 to 8 inches: very gravelly loam
H2 - 8 to 25 inches: very gravelly clay loam
H3 - 25 to 48 inches: very gravelly loam
H4 - 48 to 52 inches: weathered bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 40 to 60 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Barnabe

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from sandstone and/or chert

Typical profile

H1 - 0 to 8 inches: very gravelly loam
H2 - 8 to 16 inches: very gravelly loam
H3 - 16 to 20 inches: bedrock

Properties and qualities

Slope: 50 to 75 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): 7e
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D

Minor Components

Centissima

Percent of map unit: 5 percent
Hydric soil rating: No

Maymen

Percent of map unit: 5 percent
Hydric soil rating: No

Maymen variant

Percent of map unit: 5 percent
Hydric soil rating: No

Tocaloma

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, shallow
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, deep
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, mod. deep
Percent of map unit: 2 percent
Hydric soil rating: No

Henneke
Percent of map unit: 2 percent
Hydric soil rating: No

179—Tocaloma-McMullin complex, 30 to 50 percent slopes

Map Unit Setting
National map unit symbol: hf3n
Elevation: 50 to 1,500 feet
Mean annual precipitation: 30 to 40 inches
Mean annual air temperature: 55 to 61 degrees F
Frost-free period: 290 to 330 days
Farmland classification: Not prime farmland

Map Unit Composition
Tocaloma and similar soils: 40 percent
Mcmullin and similar soils: 35 percent
Minor components: 19 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tocaloma

Setting
Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Residuum weathered from sandstone and shale

Typical profile
H1 - 0 to 19 inches: loam
H2 - 19 to 39 inches: very gravelly loam
H3 - 39 to 43 inches: weathered bedrock

Properties and qualities
Slope: 30 to 50 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock

Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups
Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Mcmullin

Setting
Landform: Hills, hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Residuum weathered from conglomerate

Typical profile
H1 - 0 to 4 inches: gravelly loam
H2 - 4 to 18 inches: gravelly loam
H3 - 18 to 22 inches: unweathered bedrock

Properties and qualities
Slope: 30 to 50 percent
Depth to restrictive feature: 12 to 20 inches to lithic bedrock
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 2.8 inches)

Interpretive groups
Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Saurin
Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, dark surface
Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, shallow

Percent of map unit: 5 percent
Hydric soil rating: No

Los osos

Percent of map unit: 2 percent
Hydric soil rating: No

Rock outcrop

Percent of map unit: 2 percent
Hydric soil rating: No

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Appendix C:
Photographs of the Biological Study Area

Photo 1. San Geronimo Creek flows through relatively steep banks with rocky terraces within the BSA. This is a view of the creek from the south bank. The bridge is out of view to the left of this photo. Photo facing north. April 21, 2015

Photo 2. West side of the bridge on the south bank. Relatively steep slopes with rocky terraces. Photo facing north. April 21, 2015

Photo 3. Understory of primarily periwinkle, French broom, and Himalayan and California blackberry with dense riparian overstory trees. West side of bridge on the north bank. Photo facing northeast. April 15, 2015

Photo 4. Perennial Creek (PC-1). OHWM was determined by bed and bank, shelving, and change in plant community. West side of the bridge on the south bank. Photo facing north. February 25, 2019

Photo 5. PC-1. OHWM was determined by bed and bank, shelving, and change in plant community. West side of the bridge on the south bank. Photo facing downstream or west. April 21, 2015

Photo 6. PC-1. OHWM was determined by bed and bank, shelving, and change in plant community. On the bridge looking upstream. Photo facing east. February 25, 2019

Photo 7. Ephemeral Drainage 1 (ED-1), looking upstream and on the south side of Corona Avenue. Photo facing south. February 25, 2019

Photo 8. ED-1, looking downstream and on the north side of Corona Avenue. Photo facing north. April 15, 2015

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Appendix D:
Aquatic Resources Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Perennial Creek 1	CALIFORNIA	R3RB	MINSOILFLT	Area	0.199	ACRE	TNW	38.01287	-122.699467	
Ephemeral Drainage 1	CALIFORNIA	R4SB	RIVERINE	Area	0.008	ACRE	NRPW	38.012745	-122.69918	