Sir Francis Drake Boulevard Bridge Replacement Project



Natural Environment Study

Sir Francis Drake Boulevard Bridge

Marin County

Federal Project No. BRLS-5927 (099)

October 2024

Caltrans

CALIFORNIA DEPARTMENT OF TRANSPORTATION

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October 2024

STATE OF CALIFORNIA
Department of Transportation
and County of Marin

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Summary

The County of Marin proposes the Sir Francis Drake Boulevard Bridge Replacement Project (Project) to replace the existing bridge over Olema Creek. This Project is located in the community of Point Reyes Station, just west of State Route 1.

The bridge replacement will include replacing the existing bridge structure with a new single-span, cast-in-place, post-tensioned concrete slab bridge; shifting the bridge alignment to the east; constructing new bridge abutments; realigning and repaving Sir Francis Drake Boulevard; 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 1.793 acres. The Biological Study Area (BSA) is the area that may be directly or indirectly affected by the proposed Project. This includes all areas where Project activities will occur and adjacent sensitive habitats. The BSA is approximately 5.315 acres and includes areas within the Marin County right-of-way. The Project will be implemented by Marin County, which has obtained grant authorization from the California Department of Transportation (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 arroyo willow thickets, box-elder forest, poison hemlock patch, wetlands, other waters, barren/landscaped, and road. The preliminary aquatic resource delineation identified approximately 0.46 acre of other waters of the United States (U.S.) and 0.63 acre of wetland 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 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 Net Impacts within the BSA

Land Cover Type	Total Area within BSA (acres)	Temporary Impacts (acres)	Net Permanent Impacts (acres)	Total Impacts (acres)
Arroyo willow thicket	1.325	0.486	0.140	0.626
Box-elder forest	0.166	0.007	0.001	0.008
Poison hemlock patch	0.243	0.060	0.025	0.085
Perennial Creek	0.308	0.151	0.058	0.209
Adjacent Waters	0.155	0.001	0.000	0.001
Adjacent Wetlands	0.626	0.109	0.017	0.126
Barren/Landscaped	1.532	0.229	0.504	0.733
Road	0.960	N/A	N/A	N/A
Total:	**5.315**	**1.043**	**0.750**	**1.793**

Tree Survey

A tree survey of the BSA occurred on July 9 and 10 and August 11 and 18, 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 287 trees were recorded within the BSA, with trees native to California, such as arroyo willow and box-elder, representing the bulk of trees observed. A habitat survey conducted in 2020 verified no significant change in the BSA to affect the 2015 tree survey data.

Wetlands and Other Waters of the United States

Based on the aquatic delineation, there are a total of 1.410 acres of wetlands and other waters of the United States in the BSA. The Project will permanently impact approximately 0.063 acre (0.058 net impacts) and temporarily impact approximately 0.152 acre of other waters of the U.S. The Project will permanently impact approximately 0.017 acre and temporarily impact 0.109 acre of wetlands. The Project will also include temporary impacts to 0.081 acre and permanent impacts to 0.054 acre of historic Section 10 waters.

Special-status Habitats and Species

Based on literature and database searches, prior botanical surveys, and familiarity with the region, a total of 97 plant species and one sensitive community were initially evaluated, and nine species were determined to have the potential to occur within the BSA. Special-status plant surveys were 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 November 2020; 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 a follow-up survey was conducted in November 2020. Based on literature and database searches, past wildlife studies, and familiarity with the region, a total of 53 wildlife species and taxa were initially considered to have potential to occur within the BSA. Following the wildlife studies, 28 of these species were dropped from consideration based on a lack of suitable habitat. Of the remaining 25 species with potential to occur, seven federal and/or state-listed species and 12 other special-status species were considered to have at least a moderate potential to occur in the BSA. All species with moderate or high potential to occur in the BSA are listed below.

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

- California black rail (*Laterallus jamaicensis coturniculus*), state threatened, fully protected
- California freshwater shrimp (*Syncaris pacifica*), federally endangered, state endangered
- California red-legged frog (*Rana draytonii*), federally threatened, California Species of Special Concern
- Coho salmon – Central California Coast Evolutionarily Significant Unit (ESU) (*Oncorhynchus kisutch*), federally endangered, state endangered
- Northwestern pond turtle (*Actinemys marmorata*), Federally Proposed Threatened, California Species of Special Concern
- Steelhead - Central California Coast Distinct Population Segment (DPS) (*Oncorhynchus mykiss irideus*), federally threatened, included on the California Department of Fish and Wildlife (CDFW) Special Animals List
- Tidewater goby (*Eucyclogobius newberryi*), federally endangered, included on the CDFW Special Animals List
- Tricolored blackbird (*Agelaius tricolor*), state threatened, California Species of Special Concern

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

- Great blue heron (*Ardea herodias*), included on the CDFW Special Animals List
- Great egret (*Ardea alba*), included on the CDFW Special Animals List
- Marin hesparian (*Vespericola marinensis*), included on the CDFW Special Animals List
- Pallid bat (*Antrozous pallidus*), California Species of Special Concern
- Southern Coastal Roach (*Hesperoleucus venustus subditus*), California Species of Special Concern
- Townsend's big-eared bat (*Corynorhinus townsendii*), California Species of Special Concern
- Yellow warbler (*Setophaga petechia*), California Species of Special Concern
- Salt marsh common yellowthroat (*Geothlypis trichas sinuosa),* California Species of Special Concern
- San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), California Species of Special Concern
- Silver-haired bat (*Lasionycteris noctivagans*), included on the CDFW Special Animals List
- Western red bat (*Lasiurus frantzii*), California Species of Special Concern

Cumulative Effects

Future projects are planned for the region surrounding the Project area and include the following:

Giacomini Wetland Restoration Project – The National Park Service acquired the Waldo Giacomini Ranch for the purpose of wetland restoration. The Giacomini Ranch is located at the southern end of Tomales Bay. Construction to restore the wetlands was mostly completed in 2008 but additional restoration efforts continue as funding and needs arise.

Sir Francis Drake Boulevard and Point Reyes Roads – The project aims to restore the structural integrity of Sir Francis Drake Boulevard and Point Reyes National Seashore roads. Rehabilitation and reconstruction are included on 12.0 miles of Sir Francis Drake Boulevard from Pierce Point Road to Chimney Rock/Lighthouse roads (including bridge construction at Schooner Creek), and on 0.9 mile of Chimney Rock Road. Pavement preservation is included on 7.5 miles of Limantour Road, 1.5 miles of Lighthouse Road, and 11.9 miles of various roadways and parking areas within Point

Reyes National Seashore. Also included is construction of a 2-acre wetland restoration site at the existing Drakes Beach parking lot.

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 CDFW 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 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 the U.S. Army Corps of Engineers; 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

’	minute
º	degrees
AMM	Avoidance and Minimization Measure
amsl	above mean sea level
BA	Biological Assessment
Blvd	boulevard
BMPs	Best Management Practice
BO	Biological Opinion
BSA	Biological Study Area
C	Celsius
Cal-IPC	California Invasive Plant Council
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
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
County	Marin County
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CWC	California Water Code
dB	decibel
dBA	A-weighted decibel
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
FHWG	Fisheries Hydroacoustic Working Group
FGC	[California] Fish and Game Code

FR	Federal Register
GANDA	Garcia and Associates
IPaC	Information for Planning and Consultation System
ISTEA	Intermodal Surface Transportation Efficiency Act
Lmax	Maximum A-weighted decibel level
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
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
NPS	National Park Service
NWI	National Wetland Inventory
OHWM	Ordinary High Water Mark
OWUS	other waters of the United States
PCA	Project Construction Area
PCE	primary constituent element
ppt	parts per thousand
PRC	Public Resources Code
Project	Sir Francis Drake Boulevard Bridge Replacement Project
quad	quadrangle
RMS	root-mean-square
RSP	rock slope protection
RWQCB	Regional Water Quality Control Board
SEL	sound exposure level
SHC	Streets and Highways Code
SSC	California Species of Special Concern
SWRCB	State Water Resource Control Board
SWMP	Stormwater Management Plan
SWPPP	Stormwater 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 Sir Francis Drake Boulevard Bridge Replacement Project (Project) to replace the existing bridge over Olema Creek. This Project is located in the community of Point Reyes Station, just west of State Route 1 (Appendix A: Figure 1). The Project will be implemented by the County, which has obtained grant authorization from the California Department of Transportation (Caltrans).

Sir Francis Drake Boulevard (Blvd) is a two-lane, 24-foot wide, major connector that serves two-way traffic with a posted speed limit of 45 miles per hour. The roadway currently includes 11-foot lanes with one-foot shoulders in each direction. The bridge over Olema Creek was constructed in 1930 and lengthened in 1967.

Bridge replacement will include replacing the existing bridge structure with a new structure that is wider and longer. Construction of the bridge will involve excavation for, and construction of, concrete abutments supported on driven piles. 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 falsework to support the cast-in-place structure while it reaches full strength will be required within the dewatered waterway. Other temporary work within Olema Creek that is anticipated includes removal of the existing bridge, including existing abutments, piers, foundations, and wingwalls; installation of new abutments; and, installation of scour countermeasures. A temporary creek diversion is anticipated in order to complete these activities within the waterway. Relocation of overhead and underground utilities is anticipated as part of the Project. Construction is expected to begin in spring 2025 and is anticipated to have a duration of six months.

The Biological Study Area (BSA) is the area that may be directly or indirectly affected by the proposed project. This includes all areas where Project activities will occur and adjacent sensitive habitats. The estimated BSA is approximately 5.315 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 1.793 acres, not including impacts to the existing roadway.

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

The bridge was originally constructed in 1930 and was lengthened in 1967. The bridge has a long history of scour issues and debris build up at the piers. As part of the 1967 lengthening, scour mitigation measures were implemented at Pier 2, part of which appears to be acting as a check dam on the downstream side of the bridge. There is pattern cracking in the deck asphalt concrete overlay, and cracks have been identified on the bridge soffit and Pier 3. Additionally, the bridge railings are substandard, and there are no approach guardrails.

1.2 Project Description

1.2.1 Project Location

The Project is located in the community of Point Reyes Station, just west of Highway 1 (Appendix A: Figure 1). The stretch of Sir Francis Drake Boulevard through the Project site begins at Highway 1 and travels west along Lagunitas Creek before turning north and heading towards the western side of Tomales Bay. At Olema Creek, the roadway is bordered by residential properties on the north and the Point Reyes National Seashore on the south.

1.2.2 Proposed Improvements

The proposed Project would replace the existing bridge over Olema Creek with a new single-span, cast-in-place, post-tensioned concrete slab bridge approximately 77 feet in length and accommodating two 11-foot-wide lanes, six-foot-wide shoulders in each direction, and new bridge barriers, resulting in an approximate bridge width of 38 feet (Appendix A: Figure 3).

Project construction would remain primarily within the County's right-of-way; one right-of-way acquisition will be required on the south side of Sir Francis Drake Boulevard from the National Park Service (APN 166-170-03) for roadway repavement. Temporary construction easements will be required from several parcels in order to

provide access to the creek, provide storage and staging areas, and to reconstruct a private driveway. 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 Olema Creek is anticipated to include removal of the existing bridge, including existing abutments, piers, foundations, and wingwalls; installation of new abutments; and installation of scour countermeasures. A temporary creek diversion is anticipated in order to complete activities within the waterway.

1.2.3 Temporary Creek Diversion

Project construction is expected to take one six-month-long construction season beginning in 2027/2028. Construction activities within the banks of Olema 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. Work within the Olema Creek channel, including use of an excavator and backhoe, will be necessary in order to install temporary shoring, remove the existing piers and abutments, install the new abutments, and place approximately 0.09 acres of rock slope protection (RSP). 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. Access roads for installation of the creek diversion will be constructed as needed during the creek work window and contained within the temporary impact areas.

The proposed creek diversion will consist of two temporary sheet pile headwalls and one water diversion pipe. The sheet pile headwalls will be vibrated into place in the wetted channel approximately 70 feet south of the existing edge of deck and 50 feet north of the existing edge of deck, respectively. There will be two gaps in the headwalls for insertion of the water diversion pipes, which will concentrate creek flow into the pipes. The diversion pipe will be approximately 42 inches in diameter and will be placed on the creek bed. The total creek diversion will measure 165 feet in length. The creek diversion is anticipated from June 15 to October 15.

An additional area of 10 feet upstream from the upstream temporary sheet pile headwall and 10 feet downstream from the downstream temporary sheet pile headwall is proposed for access to construct the dams and may have temporary impacts by construction personnel and equipment staging. Temporary impacts to construct and

maintain the temporary creek diversion, will extend approximately 80 feet upstream and 100 feet downstream from the drip line of the existing Sir Francis Drake Boulevard Bridge (see Appendix A: Figure 4).

Before construction and placement of the creek diversion, a qualified biologist will install exclusionary netting up and downstream of the cofferdam locations and make several passes with nets or electro-fishing equipment to capture and relocate aquatic species in the creek. Once the creek diversion has been placed, any aquatic species identified in the dewatered work area will be captured and relocated as appropriate. Dewatering and aquatic species relocations plans will be submitted to regulatory agencies prior to Project construction.

Prior to placement of the sheetpiles, sharp objects, boulders, and cobbles will be removed from the diversion area to create a smooth streambed and allow a somewhat flat surface for the installation of the headwalls. 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 through the diversion pipes by gravity. 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.

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 the 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 Stormwater 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 stormwater quality Best Management Practices (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 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. This will minimize the risk of beaching and stranding of fish as the area upstream becomes dewatered.

1.2.4 Existing Bridge Demolition and New Bridge Construction

The Project will begin with bridge demolition, followed by construction of the new bridge on the same alignment.

Bridge demolition will begin with removal of the existing bridge superstructure. Demolition equipment expected to be used includes a backhoe and dump trucks. After removal of the superstructure, the abutments and wingwalls in the creek bank will be removed. Existing piers will be cut off 3 feet below ground surface. Creek protections will be in place during bridge demolition.

After existing bridge demolition, excavators will be used to excavate around the two new abutments and wingwalls. The abutment footings will measure approximately 9.5

feet by 46 feet. New wing walls will measure approximately 16 feet long. Each abutment will be supported on sixteen 16-inch-diameter, 60-foot-long Class 200 Alternative "W" steel pipe piles installed in the excavated creek bed. Piles will be installed through impact pile driving. For the range of diesel impact hammers typically utilized by bridge replacement projects, time for pile driving, not including stoppages, is between 30-60 minutes per pile. Sound pressure level for the same typical diesel impact hammers ranges from 99 A-weighted decibels (dBA) to 119 dBA at a distance of 23 feet from the pile. A-weighted decibels are relative noise levels as perceived by the human ear. The maximum dBA level is referred to as Lmax. Pile noise at peak intensity will attenuate to 80 Lmax dB, which is generally the ambient noise level, at a distance of approximately 900 feet.

Concrete pump trucks will be used to place the pile caps, abutment stems, and the superstructure. Temporary falsework will be placed within the dewatered creek bed for approximately four months to support the new cast-in-place bridge superstructure while it reaches full strength. After the superstructure concrete is cast, jacks will be used to post-tension the superstructure. Once post-tensioning is completed, a concrete barrier railing will be installed on each side of the new bridge.

1.2.5 Erosion Protection and Stormwater Improvements

To protect the channel embankment and limit the effect of erosion, 3.5-foot-thick RSP will be placed 18 feet into the creek from the face of the abutments and wrap 25 feet behind the abutments. The RSP will extend approximately 25 feet upstream and downstream of the bridge. Vegetated RSP or additional erosion control measures, such as installation of root wads, will be considered during the Project's design phase.

Existing drainage ditches along Sir Francis Drake Boulevard will be reconstructed after Project construction. No existing storm drain inlets or pipes are present within the Project area. To reduce impacts of roadway runoff to nearby waterways, the Project will include stormwater improvements. Stormwater improvements will be developed during final project design and may include bioswales, permeable pavement, or vegetated filter strips.

As is standard with all roadway projects, the contractor will be required to install temporary BMPs to control any runoff or erosion from the Project site into any nearby waterways (Olema and Lagunitas creeks). 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.

1.2.6 Roadway Repavement

After construction, the proposed new bridge profile will sit at a slightly higher elevation. In order to accommodate the wider and higher profile bridge road, the roadway approaches and Sir Francis Drake Boulevard will be realigned and repaved.

Roadway modifications will begin approximately 1,000 feet to the east of the existing bridge and will conform approximately 700 feet to the west. The alignment of Sir Francis Drake Boulevard will shift about 8 feet to the south to minimize impacts to the residential properties on the north.

Construction of the roadways will involve cold planing the existing asphalt pavement and overlaying with hot mix asphalt.

1.2.7 Utility Removal and Relocation

Relocation of overhead and underground utilities is anticipated as part of the Project. Water and communication lines that are attached to the existing bridge will be relocated onto the new structure. If the existing water distribution line cannot be temporarily shut down to facilitate bridge construction, it will be relocated onto a temporary structure during construction. Utility pole relocation will be determined in coordination with utility providers.

1.2.8 Revegetation

Project construction may result in impacts to trees and riparian vegetation along Olema Creek in the construction easement areas and immediately adjacent to Sir Francis Drake Boulevard Bridge.

In areas of temporary construction impact, appropriate replacement of native vegetation will be planted in areas where they would not affect roadway safety. Impacted areas will be remediated and replanted with appropriate native vegetation and trees. Hydroseeding of native grass seed mix will occur where appropriate. 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.

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 (AMM):

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. **Creek Work Period.** Work in the Olema Creek channel would be restricted to the period from June 15 to October 15, when stream flow will be lowest.

5. **Soft Start Pile Driving.** "Soft start" technique will be used at the beginning of each pile installation to allow any listed species that may be in the immediate area to leave before impact piling reaches full energy. The soft start will require an initial set of three strikes from the impact hammer at forty percent energy, followed by a one-minute waiting period, then two subsequent three-strike sets.

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. **Monthly Focused Black Rail Surveys.** If work is to occur within 900 feet of suitable habitat for active nests, broods, and calling centers during the nesting season from March 1 to July 31, then multiple preconstruction surveys will be conducted for black rail. If active nests (nests with eggs or young present) or calling centers are identified in surveys, all construction activities within the survey area described above will temporarily cease, and the appropriate regulatory agencies will be consulted with. No work shall occur within 700 feet and no pile driving shall occur within 900 feet of the active nests, broods, and calling centers until the young have fledged.

9. **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 August 1 to February 28.

10. **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 (March 1 to July 31).

11. **Non-disturbance Buffer for Nesting Birds.** If non-pile driving work is to occur within 100 feet of active raptor nests, 50 feet of active passerine nests, or 700 feet of a black rail nest, 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.

12. **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.

13. **California Red-legged Frog Preconstruction Survey.** No more than a week 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 those of 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.

14. **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 special-status aquatic species (fish and herpetofauna) 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 aquatic organisms and listed species that could not be removed and relocated prior to construction. The approved aquatic biologist would be present at the work site until all aquatic organisms and 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 USFWS and CDFW, as necessary.

15. **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.

16. **Water Diversion and Dewatering.** If flowing water is present in the channel, the flow would be diverted through the work area by creating a temporary creek 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 creek diversion will be maintained in order to keep the work area dry. Immediately upon completion of in-channel work, all materials would be removed from the creek in a manner that minimizes disturbance to downstream flows and water quality.

17. **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.

18. **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.

19. **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.

20. **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.

21. **Debris Containment.** Debris containment would be provided to keep bridge debris from falling into Olema Creek during demolition and construction activities.

22. **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.

23. **Listed Species On-site.** The Resident Engineer would immediately contact the agency-approved Project biologist(s) in the event that 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.

24. **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.

25. **Bat Protection.** Due to the potential of roosting bats on-site, a bat exclusion plan shall be submitted to CDFW for approval 30 days prior to the initiation of construction. The plan submitted to CDFW should incorporate the following principles:

    A Qualified Biologist shall conduct a habitat assessment for potentially suitable bat roosting habitat, including within open expansion joints of the bridge and trees, March 1 to April 1 or August 31 to October 15 prior to bridge construction activities each season. If the habitat assessment reveals the bridge structure is suitable roosting habitat for bats, then the appropriate exclusionary measures will be implemented prior to bridge construction during the period between March 1 and April 15 or August 31 to October 15. Potential avoidance may

include exclusionary blocking or filling potential cavities with foam, visual monitoring, and staging project work to avoid bats. If bats are known to use the bridge structure, exclusion netting shall not be used. If suitable habitat is present within trees, and tree removal is scheduled from April 16 through August 30 and/or October 16 through February 28, then presence/absence surveys shall be conducted two to three days prior to any tree removal or trimming. If presence/absence surveys are negative, then tree removal may be conducted by following a two phased tree removal system. If surveys indicate bat presence, then the occupied trees shall only be removed from March 1 through April 15 and/or August 31 through October 15 by following the two-phased tree removal system. The two phased system shall be conducted over two consecutive days. On the first day, (in the afternoon), limbs and branches will be removed by a tree cutter using chainsaws or other hand tools. Limbs with cavities, crevices, or deep bark fissures shall be avoided, and only branches without those features are removed. On the second day, the entire tree shall be removed.

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26. **Material Storage.** All construction pipes, culverts, or similar structures, construction equipment or construction debris left overnight within the work area would be inspected for California red-legged frogs by the agency-approved biological monitor prior to being moved.

27. **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.

28. **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). All temporarily affected areas will be revegetated with 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 riprap. Riparian trees would be planted 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, riprap 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.

29. **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 in a certified landfill, not a composting facility.

30. **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.

31. **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.

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

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

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

35. **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.

36. **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.

37. **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.

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

39. **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 Stormwater Permit to Caltrans to regulate stormwater and non-stormwater 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 Stormwater 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 stormwater and non-stormwater 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.

40. **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.

41. **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.

42. **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.

43. **Stormwater Treatment Plan**. In addition to compliance with a SWMP, the County will prepare a stormwater treatment plan that will include measures to treat post-construction stormwater runoff from the bridge deck to reduce contaminant load entering Olema Creek. Measures will be designed to avoid or minimize direct discharge of road-generated runoff to Olema Creek by diverting surface flow through vegetated areas or similar features. The plan will stipulate that the structures designed and constructed to treat stormwater runoff will receive regular long-term maintenance, with a focus on maintenance of the site in the early fall prior to the first rains of the winter season. The proposed stormwater treatment plan will be provided to NMFS for review and approval at least 120 days prior to the start of Project construction.

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. All temporarily disturbed areas will be restored after completion of construction. Any further mitigation will be determined during consultation with federal and state agencies.

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)
- California Coastal Commission
- National Park Service (NPS)

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 essential fish habitat (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) established a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. The U.S. Department of Transportation (DOT) promulgated DOT Order 5660.1A in 1978 to comply with this direction. On federally funded projects, impacts on wetlands must be identified. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included.

This must be documented in a specific Wetlands Only Practicable Alternative Finding. Additional requirement is to provide early public involvement in projects affecting wetlands. FHWA provides technical assistance in the *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (Technical Advisory T 6640.8A) and reviews environmental documents for compliance.

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 plant 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 2024, Appendix B).
- The species list from the West Coast Region of NMFS generated for the project in the Inverness quadrangle (NMFS 2022, Appendix C).
- The CNPS Inventory of Rare and Endangered Plants of California database (CNPS 2024) was searched for the following eight U.S. Geological Survey (USGS) 7.5 minute (') topographic quadrangles (quads): Inverness (485D), Bolinas (467B), Double Point (46 7E), Petaluma (484B), Point Reyes NE (485A), San Geronimo (484C), Tomales (485B), and Drakes Bay (485C) (CNPS 2024).
- The California Natural Diversity Database (CNDDB) was queried for all occurrence records and critical habitat within 2 miles of the Project (CDFW 2024b).
- CDFW's Special Animals List was also reviewed for species that may have potential to occur in the BSA but have no official CNDDB records adjacent to the BSA (CDFW 2024a). Some species on the Special Animals List, including several bat species that would be expected to occur near the Project area but for which there are no records, are under-reported in the CNDDB.

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 D and E.

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.

In 2015, Garcia and Associates-Kleinfelder (GANDA) biologists visited the BSA to conduct vegetation and landcover mapping, a tree survey, wetland delineations, rare plant surveys, and wildlife habitat assessments. As the Project was on hold for several years, biologists returned in November of 2020 to conduct verification surveys of the 2015 results.

Rare plant protocol-level surveys were not conducted again in 2020. 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 May 13, July 9, and July 10, 2015. GANDA botanist Constance Ganong resurveyed the BSA and confirmed previous vegetation and habitat mapping on November 5, 2020.

2.2.2.2. SPECIAL-STATUS PLANT SURVEYS

Protocol-level special-status plant surveys were conducted by GANDA botanist Constance Ganong and biologist Rebecca Doubledee in the BSA on May 13, July 9, and July 10, 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 increased Project area mainly consists of roadway and landscaped/ruderal land cover, no new protocol-level plant surveys were conducted in 2020.

2.2.2.3. TREE SURVEY

GANDA biologists Constance Ganong, Eric Jepsen, and Rebecca Doubledee conducted pedestrian tree surveys within the Project BSA on July 9 and 10 and August 11 and 18, 2015. All trees of 4 inches or larger 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 geographic positioning system (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 using geographic information system (GIS) technology 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 Constance Ganong surveyed the BSA on November 5, 2020 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 2020), Cowardin mapping conducted by Point Reyes National Seashore for the Giacomini Wetland Restoration Project (Parsons et al. 2005), and aerial imagery of the BSA and vicinity. GANDA botanist Constance Ganong and biologist Rebecca Doubledee conducted the field investigation on July 22, August 19, and September 9, 2015, to delineate and assess potential waters of the U.S., including wetlands and water features in the BSA. Constance Ganong delineated and reassessed potential waters of the U.S. on November 5 and 6, 2020. The preliminary delineation report for potentially jurisdictional wetlands and other waters of the U.S. is included as Appendix H.

Potentially, the wetlands within the BSA may be subject to three regulatory agencies with different definitions of wetlands. Those agencies include the following:

- The USACE has jurisdiction over waters of the U.S., including wetlands, through Section 404 of the CWA and Section 10 of the Rivers and Harbors Act.
- The California Coastal Commission is one of California's three designated coastal management agencies for the purpose of administering the federal Coastal Zone Management Act in California.
- The NPS is the landowner of the Sir Francis Drake Blvd Bridge site and uses a modified Cowardin approach to identifying wetlands (Cowardin et al. 1979; personal communication with K. Ward on June 10, 2015).

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. Personnel and survey dates are summarized in Table 1. Acoustic and hydroacoustic analyses were also conducted to estimate the noise impacts from pile driving.

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	Kleinfelder-GANDA

Staff	Survey Dates	Company/affiliation
Vegetation Typing		
Constance Ganong and Rebecca Doubledee Constance Ganong	5/13/15, 7/9/15, and 7/10/15 11/5/2020	Kleinfelder-GANDA
Wetland Delineation		
Constance Ganong and Rebecca Doubledee Constance Ganong	7/22/15, 8/19/15, and 9/9/2015 11/5/2020 and 11/6/2020	Kleinfelder-GANDA
Rare Plant Surveys		
Constance Ganong and Rebecca Doubledee	5/13/15, 7/9/15, and 7/10/15	Kleinfelder-GANDA
Tree Survey		
Constance Ganong, Eric Jepsen, and Rebecca Doubledee Constance Ganong	7/9/15, 7/10/15, 8/11/15, and 8/18/15 11/5/2020	Kleinfelder-GANDA

2.3. Agency Coordination and Professional Contacts

Caltrans will coordinate with USFWS, NMFS, and USACE representatives, and the County of Marin 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.

2.4. 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 May 13, 2015 was past the blooming time (January through March) for the western leatherwood (*Dirca occidentalis*); however, the species was detectable at a reference site in February 2015, during the species' leafing period.

The roosting bat habitat survey focused on identifying bats roosting in and on the Sir Francis Drake Blvd 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 and hoary bat 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 2020 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 BSA for the Project is located in Marin County, California, in Township 3N, Range 9W, Section 35-36 of the *Inverness* USGS 7.5' topographic quad. The BSA is within the community of Point Reyes Station, just west of Highway 1 (Appendix A: Figure 1).

3.1. Description of the Existing Biological and Physical Conditions

3.1.1. Study Area

The BSA is the area that the proposed project's activities may directly affect, along with adjacent sensitive habitat, which typically extends beyond the project footprint where specific construction actions occur. For this Project, the BSA was defined by a 30-foot buffer from edge of pavement north of Sir Francis Drake Blvd and a 70-foot buffer from edge of pavement south of Sir Francis Drake Blvd (Appendix A: Figure 2). The BSA for the Project totals approximately 5.315 acres. Additionally, noise impacts from pile driving were calculated and mapped to account for any species that may occur within the noise buffer (Appendix A: Figure 5). The noise impact buffer is larger than the BSA.

3.1.2. Physical Conditions

The BSA is located at the base of Olema Valley immediately south of Tomales Bay. Olema Valley is a gorge formed by the San Andreas Fault and Olema Creek follows along the fault line south to north through the valley. The BSA is bordered by residential properties on the north and the Point Reyes National Seashore on the south. Elevation within the BSA ranges from 2 feet above mean sea level (amsl) in the middle of Olema creek to 13 feet amsl along Sir Francis Drake Blvd. Most of the land immediately surrounding the BSA and within Olema Valley is currently located within the Point Reyes National Seashore, but there is a long history of dairy and beef ranches in the valley and several are still operational (Livingston 1995). Lower Lagunitas Creek is located immediately north of the BSA. Lagunitas Creek estuary, at the base of Tomales Bay, has recently been restored back to tidal marsh. The Giacomini Wetland

Restoration Project, which started construction in 2008, consisted of converting a 563-acre dairy farm (Giacomini Ranch) back to tidal marsh. Immediately northeast of the BSA is the town of Point Reyes Station.

The BSA is located within the Tomales Bay Watershed. The Lagunitas Creek sub-watershed is the largest drainage into Tomales Bay, and its major tributaries include San Geronimo Creek, Devils Gulch, Cheda Creek, Nicasio Creek, and Olema Creek. At the southwestern edge of the watershed, Olema Creek flows northward in a nearly straight line through a rift valley along the San Andreas Fault. Olema Creek flows north through the BSA where it connects to Lagunitas Creek, which then ends at Tomales Bay.

The climate in the BSA is Mediterranean, which has moist, mild winters and dry summers. Annual precipitation averages 37 inches and is typically delivered as rainfall between November and April. Average temperature is 59 degrees (°) Fahrenheit (Western Regional Climate Center 2020).

Soil types in the BSA were identified using the Web Soil Survey, a resource provided by the Natural Resources Conservation Service (NRCS) (NRCS 2020).

Three different soil units were identified in the vicinity of the BSA: Barnabe very gravelly loam, Blucher-Cole complex, and Fluvents (Appendix A: Figure 6) (NRCS 2020). A summary description of these soil types is provided in Table 2.

Table 2. Soil Types in the Project Vicinity.

Soil Type	Symbol	Description
Barnabe very gravelly loam, 30 to 50 percent slopes	103	Well drained soils on side slopes. Parent material is residuum weathered from sandstone and/or chert. Permeability is moderately high to high.
Blucher-Cole complex, 2 to 5 percent slopes	105	Somewhat poorly drained soils on basin floor or alluvial fans. Parent material is alluvium derived from shale, sandstone, or granite. Permeability is moderately low to moderately high.
Fluvents, channels	127	Stratified cobbly sand to silt loam on flood plains. Parent material is alluvium derived from igneous, metamorphic and sedimentary rock.

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. Eight land cover types were identified within the BSA.

Table 3 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 4.

Table 3. Land Cover and Vegetation Types and Acreages in the BSA.

Land Cover Type	Acreage
Arroyo willow thicket	1.325
Box-elder forest	0.166
Poison hemlock patch	0.243
Perennial Creek	0.308
Adjacent Waters	0.155
Adjacent Wetlands	0.626
Barren/Landscaped	1.532
Road	0.960
Total	**5.315**

3.1.3.1. ARROYO WILLOW THICKETS: *SALIX LASIOLEPIS* SHRUBLAND ALLIANCE AND ADJACENT WETLAND

Arroyo willow (*Salix lasiolepis*) is a riparian tall shrub or tree that may grow to approximately 25 feet tall. Arroyo willow grows on seasonally or intermittently flooded sites, such as stream banks, slope seeps, and drainages. Within Point Reyes National Seashore, arroyo willow stands are structurally variable, where most stands are tall shrublands and some are forests that dominate the canopy with at least 50 percent relative cover (Schirokauer et al. 2003). The understory is extremely dense because of the thicket-forming growth habit of this species.

Arroyo willow thicket is the predominate vegetation in the BSA and totals approximately 1.325 acres (Appendix A: Figure 4). There is also approximately 0.626

acre of adjacent wetland associated with the arroyo willow thickets (Appendix A: Figure 6). The herbaceous layer under arroyo willow wetland canopy included lady fern (*Athyrium filix-femina*), water parsley (*Oenanthe sarmentosa*), and coast carex (*Carex obnupta*). The soils within the wetlands are probably slightly saline because they are hydrologically connected to Lagunitas Creek, which is tidally influenced, by a surface water connection within the western portion of the BSA.

Within the upland areas of arroyo willow thicket, the understory is extremely dense with shrub dominates such as California blackberry (*Rubus ursinus*), poison oak (*Toxicodendron diversilobum*), and coast twin berry (*Lonicera involucrate* var. *ledebourii*). Herbaceous plants include stinging nettle (*Urtica dioica*) and California bee plant (*Scrophularia californicum*). Some areas of arroyo willow thicket contain *Salix lasiolepis–Rubus ursinus* association as described in Point Reyes National Seashore-Golden Gate National Recreation Community Key (Schirokauer et al. 2003).

The vegetation types labeled as arroyo willow thickets and box-elder forest (discussed below) are riparian woodlands because of their proximity to Olema Creek. Riparian 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. Mammals that use this habitat for foraging and cover include northern raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginianus*), mule deer (*Odocoileus hemionus*), dusky-footed woodrats (*Neotoma fuscipes*) and numerous bat species. Several dusky-footed woodrat nests and mule deer droppings were observed throughout the arroyo willow thicket while conducting the tree survey.

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). Bird species observed in the arroyo willow thicket during the tree survey and wildlife habitat assessment were pacific-slope flycatcher, hermit thrush (*Catharus guttatus*), red-breasted sapsucker (*Sphyrapicus ruber*), chestnut-backed chickadee (*Poecile rufescens*), wrentit (*Chamaea fasciata*), California quail (*Callipepla californica*), and spotted towhee (*Melozone crissalis*). A coast gartersnake (*Thamnophis elegans terrestris*) was also observed in the arroyo willow thicket during the tree survey. California red-legged frogs (*Rana draytonii*) likely use this area for foraging or estivating during the non-breeding season (Fellers and Kleeman 2007).

3.1.3.2. BOX-ELDER FOREST: ACER NEGUNDO FOREST ALLIANCE

Box-elder (*Acer negundo*) is a deciduous hardwood that grows to approximately 65 feet in height and lives 60 years or more. Box-elder is a very wide-ranging species in North America. The alliance is limited in California to mainly riparian zones of streams and rivers that are regularly flooded.

A small area (0.166 acre) of box-elder forest is located between the poison hemlock patch and an arroyo willow thicket south of Sir Francis Drake Blvd at the east end of the BSA. The understory here is sparse but included California blackberry, lady fern, and stinging nettle.

3.1.3.3. POISON HEMLOCK PATCH: CONIUM MACULATUM SEMI-NATURAL HERBACEOUS STANDS

Poison hemlock (*Conium maculatum*) is a short-lived perennial herb from Europe. California Invasive Plant Council (Cal-IPC) lists the species as invasive in wildland settings in the state and it has a Cal-IPC rank of Moderate (Cal-IPC 2020). Poison hemlock occurs in relatively moist locations and is tolerant of semi-shade, such as bottomlands and swales. All parts of the plant are toxic to humans, especially seeds and young leaves.

Within the BSA, there is a poison hemlock patch of approximately 0.243 acre between arroyo willow thicket and box-elder forest south of Sir Francis Drake Blvd. The patch was almost 100 percent poison hemlock with little other herbaceous cover.

Poison hemlock is poisonous to humans, livestock, and wildlife if consumed. All classes of livestock and wildlife are susceptible to poison hemlock from ingestion, including cattle, horses, pigs, goats, sheep, elk, and turkeys. Nevertheless, the patch of poison hemlock in the BSA may provide suitable cover for birds, rodents, and other wildlife species.

3.1.3.4. BARREN/LANDSCAPED

Landscaped areas have been impacted by grading, mowing, filling, and residential and commercial use. Ornamental trees and shrubs are planted on private property and along residential driveways within the BSA. Ruderal vegetation such as non-native, invasive forbs and grasses also occur within this area of the BSA. Landscaped vegetation total approximately 1.532 acre within the BSA.

There are several larger non-native/ornamental tree species in the area mapped as landscaped. These include liquid amber (*Liquidambar styraciflua*), Monterey cypress (*Cupressus macrocarpa*), and Monterey pine (*Pinus radiata*). Monterey cypress and pine are native to California but have a limited range where they occur naturally. They are used commercially or as ornamentals outside of that range, where they can often spread, and they are considered invasive in most of California, including in Marin County. These trees may provide important perch sites for local raptors such as osprey (*Pandion haliaetus*), red-shouldered hawk (*Buteo lineatus*), and white-tailed kite (*Elanus leucurus*). All of these species were observed flying over the BSA during the wildlife habitat assessment and/or tree survey.

3.1.3.5. WATERS

Non-wetland water features delineated in the BSA consist of a perennial creek (Olema Creek) and adjacent waters, which are areas with standing water or areas that supported less than 5 percent vegetation cover and are contiguous with the tidally influenced Lagunitas Creek via a channel under Sir Francis Drake Boulevard. The areas for each of these non-wetland waters are detailed in Table 4 and in Appendix A: Figure 6, as well as in the wetland delineation in Appendix H.

PERENNIAL CREEK

The perennial creek (or riverine) is typically characterized by intermittent or continually running water. Perennial creek habitat within the BSA contains vegetation such as torrent sedge (*Carex nudata*) and hardstem bulrush (*Schoenoplectus acutus*) within the active creek channel, which is shadowed by over-story trees, including arroyo willow and red alder (*Alnus rubra*).

The perennial creek feature, Olema Creek, totals approximately 0.308 acre within the BSA. Olema Creek flows northwest under the Sir Francis Drake Blvd Bridge in the BSA and outlets at Lagunitas Creek. Olema Creek forms a backwater channel to the east before the bridge, which may be caused by the tidal influence of Lagunitas Creek. The mean high tide was identified by the presence of changes in substrate and vegetation and the natural line impressed on the bank (see Appendix H for more details).

Olema Creek provides suitable habitat for a variety of fish species and is connected to Tomales Bay and the Pacific Ocean with no barriers, such as dams or reservoirs. Fish species known to occur in Olema Creek include Southern coastal roach (*Hesperoleucus venustus subditus*), the Central California Coast (CCC) Distinct Population Segment

(DPS) of steelhead (*Oncorhynchus mykiss irideus*), the CCC Evolutionary Significant Unit (ESU) of coho salmon (*O. kisutch*), pacific lamprey (*Entosphenus tridentatus*), and tidewater goby (*Eucyclogobius newberryi*). Further upstream of the BSA, Olema Creek provides important rearing habitat for the CCC DPS of steelhead, the CCC ESU of coho salmon, and Pacific lamprey. The CCC DPS of steelhead are listed as federally threatened, the CCC ESU of coho are listed as federally endangered, and the pacific lamprey is on CDFW's Special Animals List (CDFW 2024a). Amphibians and reptiles that are known to occur in Olema Creek include the pacific treefrog (*Pseudacris regilla*), coast gartersnake, and California red-legged frogs (Fellers and Kleeman 2007). Many species of insectivorous birds (i.e., swallows, swifts, flycatchers) catch their prey on the wing while over open water. Bird species observed near Olema Creek include belted kingfisher (*Megaceryle alcyon*) and black phoebe (*Sayornis nigricans*). An active black phoebe nest with at least three nestlings was observed on a vertical surface of the east bridge pier. Other birds that may use the bridge itself for nesting are house finch (*Haemorhous mexicanus*) and barn swallow (*Hirundo rustica*).

ADJACENT WATERS

In addition to Olema Creek, the other potential jurisdictional Section 404 non-wetland waters include the adjacent waters at the west end of the BSA, south of Sir Francis Drake Blvd. These waters are hydrologically connected to or contiguous with Lagunitas Creek by a channel which flows under Sir Francis Drake Blvd to the west of the BSA.

The adjacent water feature totals approximately 0.155 acre in the BSA. This area was classified as waters because it had standing water or supported less than five percent vegetation cover. Herbaceous plants in this area included water parsley and lady fern. Overstory trees included arroyo willow and California buckeye (*Aesculus californica*).

The adjacent waters at the west end of the BSA provide important habitat for numerous wildlife species; however, their use may be limited by salinity levels. The adjacent waters are hydrologically connected to Lagunitas Creek by a channel which flows under Sir Francis Drake Blvd to the west of the BSA. This portion of Lagunitas Creek is tidally influenced, and salinity levels have been measured between 3.5 and 14.4 parts per thousand (ppt) (Fong 2002) but may exceed this during high tide. No fish were observed during field surveys; however, since it is directly connected to Lagunitas Creek, any species occurring in Lagunitas Creek could potentially move into these adjacent waters. Potential fish species that may occur in Lagunitas and Olema creeks

are steelhead, coho salmon, mosquitofish (*Gambusia affinis*), threespine stickleback (*Gasterosteus aculeatus*), and tidewater goby.

Amphibians and reptiles that may utilize this habitat are the pacific treefrog, coast gartersnake, and California red-legged frogs. A black phoebe was observed foraging over the open water pool and perching in the adjacent California buckeye.

3.1.3.6. ROAD

The road surfaces within the BSA are the local streets of Sir Francis Drake Boulevard. 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

The BSA is located in Point Reyes National Seashore. The majority of land along the western coast of Marin County from the Golden Gate Bridge to Tomales Point consists of federal or State protected land (i.e., Golden Gate National Recreation Area and Point Reyes National Seashore), making the small area within the BSA a less significant corridor for terrestrial wildlife. On the other hand, Olema Creek is a significant aquatic corridor for numerous species.

Olema Creek originates near Bolinas Lagoon and flows north down the entire length of Olema Valley, entering Lagunitas Creek just before its outlet into Tomales Bay. Olema Creek is occupied by the following anadromous fish species: CCC coho salmon, CCC steelhead, and pacific lamprey. This means that as adults all of these species pass through the BSA during spawning season and juveniles pass back through the BSA during other seasons to reach the Pacific Ocean. Therefore, the BSA is an important migratory corridor for salmonids, pacific lamprey, and numerous other aquatic species.

3.2. Regional Species and Habitats and Natural Communities of Concern

Appendices D and E 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 a moderate or high potential to occur, including species that may only occur during migration and during foraging, are evaluated in more detail in Chapter 4. Species that

have a low likelihood or 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 2024b). 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

This section discusses waters of the U.S., including wetlands, their potential to be affected by Project activities, specific AMMs, and cumulative effects.

4.1.1.1. SURVEY RESULTS

The BSA includes tidal and non-tidal wetlands and OWUS subject to USACE jurisdiction under Section 404 and Section 10 regulations. A total of approximately 0.64 acre of potential jurisdictional Section 10 waters (including historic Section 10 waters) and a total of approximately 1.08 acre of potential jurisdictional Section 404 waters, including wetlands, were delineated within the 5.315 acres of the BSA. These features are illustrated in Appendix A: Figure 6 and summarized in Table 4.

Section 10 waters within the BSA include Olema Creek, which was estimated to be approximately 150 feet wide and 170 feet long, with an area of 0.308 acre. The historical extent of Section 10 tidal waters was mapped based on the delineation for the Point Reyes National Seashore for the Giacomini Wetland Restoration Project, which used U.S. Coast Survey maps from 1862 (Parsons 2005; personal communication with L. Parsons on September 3, 2015) and was verified by the USACE on February 11, 2008 (USACE 2008b). Historic other waters totaling 0.33 acre were observed at the west end of the BSA. In the BSA, there are also adjacent other waters, or Section 404 waters, totaling 0.15 acre. Adjacent waters, which are areas with standing water or areas that supported less than 5 percent vegetation cover, are hydrologically connected to or contiguous with Lagunitas Creek by a channel that flows under Sir Francis Drake

Boulevard to the west of the BSA. Additionally, three adjacent wetlands totaling 0.62 acre are contiguous with the adjacent water and Olema Creek and occur south of Sir Francis Drake Boulevard beyond fill or berms along the roadway and appear to be hydrologically connected to Olema Creek (Appendix A: Figure 6). Physical characteristics used to delineate the ordinary high water mark (OHWM) for this Project included the following:

- 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

All waters are considered jurisdictional since Olema Creek feeds into Lagunitas Creek, which eventually terminates in Tomales Bay. A summary of wetlands and waters in the BSA is shown in Table 4.

Table 4. Wetland and Other Waters in the BSA.

Section 10 and 404 Waters	Area (acres)	Linear Feet
Historic Waters (HW-1)	0.33	752
Olema Creek (W-1)	0.31	215
Total	**0.64**	**967**
Section 404 Waters – Adjacent Waters		
Adjacent Waters (AWA-1)	0.15	276
Total	**0.15**	**276**
Section 404 Waters – Adjacent Wetlands		
Adjacent Wetland (AWE-1)	0.19	333
Adjacent Wetland (AWE-2)	0.26	365
Adjacent Wetland (AWE-3)	0.17	277
Total	**0.62**	**975**
Total Aquatic Resources	**1.41**	**2,218**

4.1.1.2. PROJECT IMPACTS

Approximately 0.341 acre of potentially jurisdictional waters will experience temporary and permanent impacts (Table 5). Additionally, 0.135 acre of historic waters that overlap other features will be impacted. The Project will result in temporary impacts to 0.152 acre of other waters and 0.109 acre of temporary impacts to wetlands.

Additionally, net permanent impacts to approximately 0.017 acre of wetlands and 0.058 acre of other waters are anticipated. Temporary impacts include access for construction equipment into the creek channel and the diversion of the low flow channel.

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 net permanent impacts to approximately 0.058 acre of perennial creek and approximately 0.017 acre of adjacent wetlands. The widened bridge deck, which is an increase of 11 feet, will also increase shading over Olema Creek by 0.022 acre (Appendix A: Figure 7). However, 0.005 acre of the perennial creek will be restored after the removal of the existing bridge piers and abutments. Net impacts to wetlands and waters are shown in Table 5. Historic waters partially overlap the current other water features, so their acreages are not counted in the total impacts.

Table 5. Net Impacts to Wetlands and Other Waters within the BSA.

Section 10 and 404 Waters	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Historic Waters (HW-1) *Overlaps other features*	0.081	0.054	0.135
Olema Creek (W-1)	0.151	0.058	0.209
Total (Not including HW-1)	**0.151**	**0.058**	**0.209**
Section 404 Waters – Adjacent Waters			
Adjacent Waters (AWA-1)	0.001	0.000	0.001
Total	**0.001**	**0.000**	**0.001**
Section 404 Waters – Adjacent Wetlands			
Adjacent Wetland (AWE-1)	0.000	0.000	0.000
Adjacent Wetland (AWE-2)	0.077	0.011	0.088
Adjacent Wetland (AWE-3)	0.032	0.006	0.038
Total	**0.109**	**0.017**	**0.126**
Total Aquatic Resources	**0.261**	**0.075**	**0.336**

In-stream work in Olema Creek may be limited to the dry season (June 15 to October 15) to reduce impacts. Olema Creek will be protected from debris during construction, but workers will need to be in the creek when installing and removing these protections.

4.1.1.3. AVOIDANCE AND MINIMIZATION EFFORTS

The potential for adverse impacts to waters will be minimized through the implementation of Measure #39. 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

The creek channel and banks will be restored after completion of the Project. All temporarily impacted areas, including the creek banks, will be re-vegetated with a native grass seed mix. Additionally, 0.005 acre of perennial creek will be restored when the existing bridge is removed. 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 Olema 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. Two past, current, or future projects in the area around Olema Creek, Lagunitas 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:

Giacomini Wetland Restoration Project – The National Park Service acquired the Waldo Giacomini Ranch for the purpose of wetland restoration. The Giacomini Ranch is located at the southern end of Tomales Bay. Construction to restore the wetlands were mostly completed in 2008 but additional restoration efforts continue as funding and needs arise.

Sir Francis Drake Boulevard and Point Reyes Roads – The project aims to restore the structural integrity of Sir Francis Drake Boulevard and Point Reyes National Seashore roads. Rehabilitation and reconstruction are included on 12.0 miles of Sir Francis Drake Boulevard from Pierce Point Road to Chimney Rock/Lighthouse roads (including bridge construction at Schooner Creek), and on 0.9 mile of Chimney Rock Road. Pavement preservation is included on 7.5 miles of Limantour Road, 1.5 miles of

Lighthouse Road, and 11.9 miles of various roadways and parking areas within Point Reyes National Seashore. Also included is construction of a 2-acre wetland restoration site at the existing Drakes Beach parking lot.

Both 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. Riparian 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 arroyo willow thicket (1.325 acres) (Appendix A: Figure 4) is the area of the BSA that falls 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

It is anticipated that fourteen trees in riparian areas of Olema Creek and south of Sir Francis Drake Boulevard will be removed for Project construction. Several trees on the east and west sides of the existing bridge and in riparian areas may also require trimming.

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 #17). Additionally, Measure #39 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 is complete, temporarily exposed and disturbed areas will be re-vegetated. All riparian trees removed would be mitigated at a 3:1 ratio. The exact ratios will be determined during the project's permitting process.

4.1.2.5. CUMULATIVE IMPACTS

Two 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.

Both 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, botanical surveys, and familiarity with the region, a total of 97 plant species and one CNDDB sensitive community were initially evaluated (Appendix D). After considering vegetation information, reviewing the habitat preferences, geographic distribution, elevation range, and known locations of all species on the preliminary list, nine special-status species were determined to have potential to occur in the BSA because of suitable habitat. None of these nine species were observed in the BSA after protocol-level surveys in May and July 2015 (Appendix D). Figure 8 in Appendix A shows all CNDDB rare plant species occurrences within two miles of the BSA and Figure 9 in Appendix A shows CNDDB occurrences of federally listed rare plant species within five miles of the BSA.

The rare plant survey was conducted on May 13 and July 9 and 10, 2015. No federal or state-listed plants, or plants with CNPS California Rare Plant Ranks (CRPR) were observed in the BSA. A list of plants observed during the plant survey can be found in Appendix F. Additional surveys to verify potential habitat for rare plants were conducted in November 2020. No federally or state-listed plants, or plants with CRPRs were observed in the BSA.

4.3. Trees

4.3.1. Survey Results

A total of 287 trees with a DBH class of four inches or greater were recorded within the BSA (Appendix A: Figure 10; Table 6). Twenty-eight percent (82 trees) of all trees surveyed had two or more trunks below 4.5 feet from the base with a DBH greater than four inches. The largest single stems measured were arroyo willows, with a DBH of 45 inches (Table 6). Forty multi-stem trees had DBHs greater than 25 inches.

Fifteen different tree species were identified within the BSA, and nine are California native flora (Table 6). Native trees represented the bulk of the trees observed in the survey (271 trees). The most abundant species was the arroyo willow (233 trees), followed by box-elder (19 trees). Box-elder are dominant in a small area on the east side of the BSA south of Sir Francis Drake Blvd (Appendix A: Figure 4). Arroyo willows are dominant throughout the remainder of the BSA. A complete list of trees measured during the survey along with their corresponding DBHs is included in Appendix E.

Table 6. Tree Species Present in the BSA.

Common Name	Scientific Name	Status	Abundance
Apple	*Malus* sp.	Non-Native	2
Arroyo willow	*Salix lasiolepis*	Native	233
Big-leaf maple	*Acer macrophyllum*	Native	1
Box-elder	*A. negundo var. californicum*	Native	19
California bay	*Umbellularia californica*	Native	3
California buckeye	*Aesculus californica*	Native	1
Coast live oak	*Quercus agrifolia*	Native	3
Douglas fir	*Pseudotsuga menziesii*	Native	1
Liquid amber	*Liquidambar styraciflua*	Non-Native	1
Maple (ornamental)	*Acer* sp.	Non-Native	1
Monterey cypress	*Hesperocyparis macrocarpa*	Non-Native	5
Monterey pine	*Pinus radiata*	Non-Native	5
Oregon ash	*Fraxinus latifolia*	Native	7
Red alder	*Alnus rubra*	Native	3

Common Name	Scientific Name	Status	Abundance
Unknown ornamental tree		Non-Native	2
Grand Total			**287**

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 #17), preconstruction tree survey (Measure #27), and restoration and revegetation of temporarily impacted areas (Measure #28), 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 fourteen trees, south of Sir Francis Drake Boulevard, 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 the 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 and RWQCB applications. In coordination with CDFW, trees in the upland areas will be compensated for on-site.

4.3.5. Cumulative Impacts

Two 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.

Both 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 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 53 wildlife species and taxa were initially assessed for a potential to occur within the BSA (Appendix E). After conducting a wildlife habitat assessment and reviewing the habitat preferences, geographic distribution, and known locations of all taxa on the preliminary list, the list was revised to include 25 special-status species with the potential to occur in the BSA. Seven of these species have a low potential to occur, nine have a moderate potential to occur, ten have a high potential to occur, and one is categorized as present because they were observed during one of the site visits. Special-status species with low or no potential to occur are not considered in detail in this report but are identified and briefly discussed in Appendix E. Table 7 lists the special-status animal species with moderate or high potential to occur. Species with moderate or high potential to occur that have federal designation, state designation, and/or are California Species of Special Concern (SSC) are discussed in more detail in this NES. Additionally, migratory birds and roosting bats will also be discussed in more detail due to their known occurrences in the general area. Net Project impacts are detailed in Table 8.

Table 7. The Special-status Animal Species Discussed in this NES.

Common Name	Scientific Name	Status[1] (Federal/ State)	Potential to Occur in the BSA	Habitat Present/ Absent[2,3,4]	Determination for federally listed species
Invertebrates					
California freshwater shrimp	*Syncaris pacifica*	FE / SE	High	HP	**May Affect, Likely to Adversely Affect**
Fish					

Common Name	Scientific Name	Status[1] (Federal/ State)	Potential to Occur in the BSA	Habitat Present/ Absent[2,3,4]	Determination for federally listed species
Tidewater goby	*Eucyclogobius newberryi*	FE / SA	Moderate	HP, CH	**May Affect. Likely to Adversely Affect.** **May Affect, Not Likely to Adversely Affect Critical Habitat.**
Southern coastal roach	*Hesperoleucus venustus subditus*	-- / SSC	Moderate	P, HP	NA
Coho salmon - central California coast ESU	*Oncorhynchus kisutch*	FE / SE	High	HP, CH, EFH	**May Affect. Likely to Adversely Affect.** **May Affect, Likely to Adversely Affect Critical Habitat**.
Steelhead - central California coast DPS	*Oncorhynchus mykiss irideus*	FT / SA	High	HP, CH	**May Affect. Likely to Adversely Affect.** **May Affect, Likely to Adversely Affect Critical Habitat**.
Amphibians					
California red-legged frog	*Rana draytonii*	FT / SSC	High	HP, CH	**May Affect. Likely to Adversely Affect.** **May Affect. Not Likely to Adversely Affect Critical Habitat**

Common Name	Scientific Name	Status[1] (Federal/ State)	Potential to Occur in the BSA	Habitat Present/ Absent[2,3,4]	Determination for federally listed species
Reptiles					
Northwestern pond turtle	*Actinemys marmorata*	FPT / SSC	High	HP	**May Affect, Not Likely to Adversely Affect.**
Birds					
Tricolored blackbird (nesting colony)	*Agelaius tricolor*	-- / ST, SSC	Moderate	HP	NA
Great egret (nesting colony)	*Ardea alba*	-- / SA	Moderate	HP	NA
Great blue heron (nesting colony)	*Ardea herodias*	-- / SA	Moderate	HP	NA
Salt marsh common yellowthroat	*Geothlypis trichas sinuosa*	-- / SSC	High	HP	NA
California black rail	*Laterallus jamaicensis coturniculus*	-- / ST, FP	Moderate	HP	NA
Yellow warbler	*Setophaga petechia*	-- / SSC	High	HP	NA
Mammals					
Pallid bat	*Antrozous pallidus*	-- / SSC	High	HP	NA
Townsend's big-eared bat	*Corynorhinus townsendii*	-- / SSC	High	HP	NA
Silver-haired bat	*Lasionycteris noctivagans*	-- / SA	Moderate	HP	NA
Western red bat	*Lasiurus frantzii*	-- / SSC	Moderate	HP	NA
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	-- / SSC	High	HP	NA

Common Name	Scientific Name	Status[1] (Federal/ State)	Potential to Occur in the BSA	Habitat Present/ Absent[2,3,4]	Determination for federally listed species

[1]**Status Codes**:

Federal Status Designations:
FE: Listed as Endangered under the Federal Endangered Species Act
FT: Listed as Threatened under the Federal Endangered Species Act
FPT: Proposed for Listing as Threatened under the Federal Endangered Species 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
SC: Candidate for listing under the California Endangered Species Act
SSC: California Species of Special Concern
SA: Included on the California Department of Fish and Wildlife's Special Animals List

[2]Absent **[A]** – No habitat present.
Habitat Present **[HP]** – Habitat is or may be present. The species may be present.
Present **[P]** – Species is present.

[3]Critical Habitat **[CH]** – BSA is located within or adjacent to a designated critical habitat unit but does not necessarily mean that appropriate habitat is present.

[4]Essential Fish Habitat **[EFH]** – BSA is located within Essential Fish Habitat.

Table 8. Net Impacts within the BSA

Land Cover Type	Temporary Impacts (acres)	Net Permanent Impacts (acres)	Total Impacts (acres)
Arroyo willow thicket	0.486	0.14	0.626
Box-elder forest	0.007	0.001	0.008
Poison hemlock patch	0.06	0.025	0.085
Perennial Creek	0.151	0.058	0.209
Adjacent Waters	0.001	0.000	0.001
Adjacent Wetlands	0.109	0.017	0.126
Barren/Landscaped	0.229	0.504	0.733
Road	N/A	N/A	N/A
Total:	**1.043**	**0.750**	**1.793**

4.4.1. Hydroacoustic Modeling and Fisheries Impact Analysis

On June 12, 2008, the Fisheries Hydroacoustic Working Group (FHWG), whose members include NMFS's Southwest and Northwest divisions, the California, Washington, and Oregon departments of transportation, CDFW, and the FHWA, issued an agreement for the establishment of interim threshold criteria to determine the effects of high-intensity sound on fish. These criteria were established after extensive review of the most recent analysis of the effect of underwater noise on fish from pile driving in water. The agreed-upon threshold criteria for noise to have an injury effect on fish

has been set at 206 decibels (dB) peak sound exposure level (SEL), 187 dB accumulated SEL for fish over two grams, and 183 dB accumulated SEL for fish less than two grams (FHWG 2008). The FHWG has determined that noise at or above these levels can cause damage to auditory tissues and temporary threshold-hearing shifts in fish. In addition, a threshold of 150 dB root-mean-square (RMS) was established as the level that elicits a behavioral response, but no injury, in fish.

Hydroacoustic analyses were completed to model the area around the proposed pile driving subject to the regulatory thresholds previously described (i.e., dB peak, dB accumulated SEL, and dB RMS). Distances to these thresholds were calculated using the assumptions that the pressure wave would be partially confined by the existing concrete abutments, piles would be driven on land, and no more than five piles would be driven in a 24-hour period. Two case studies from the *Hydroacoustic Effects of Pile Driving on Fish* (Caltrans 2015) report were used to develop the predicted regulatory thresholds. Both projects drove piles on land or inside dewatered cofferdams. Although the pile material and size varied, the two projects had similar characteristics to the proposed Project (Table 9). Modeled distances to FHWG thresholds for the Project are presented in Table 10.

Table 9. Hydroacoustic Case Studies (Caltrans 2015).

Pile Size/Type	Distance from Pile	Depth	Measured Sound Pressure			Attenuation Note
			Peak Maximum	Root Mean Squared Maximum Average	SEL	
14-inch thick walled steel H-piles on land. Platte River	10 meters	0.5-2 meters	172	160	147	Driven inside a dry cofferdam
12-inch concrete piles on land, Haehl Creek	10 meters	0.3 meters	176	161	146	Driven on the creek bank

Table 10. Distance to FHWG Regulatory Thresholds and Area Affected from Pile Driving.

Threshold	Distance (feet)	Area (acres)
206 dB peak SEL	0	0

187 dB accum. SEL	13.12	0.04
183 dB accum. SEL	19.68	0.065
150 dB RMS	147.63	0.18

4.4.2. Impact Pile Driving Noise in Air Calculations

Typical maximum pile driving noise levels at a distance of 50 feet is approximately 105 decibels (dB) (Illingworth and Rodkin 2019). Pile driving noise at peak intensity will attenuate to 80 dB, which is generally the ambient noise level, at approximately 900 feet (Appendix A: Figure 5). Studies of noise criteria suggest that noise levels above 80 dB are disruptive to normal behavioral patterns in birds (Transportation Noise Control Center 1997).

Bird species are known to respond to new or unusual sounds in their environments by displaying behavior that suggests harassment, such as flushing, avoidance, or missing food delivery to nestlings. Heightened noise levels above the area's typical background noise may also prevent vocalization detection among birds, and, finally, may damage individual's hearing (Dooling and Popper 2007). The County has added an avoidance and minimization measure requiring a soft-start pile driving practice, which will allow birds to leave the immediate area before impact pile driving reaches full capacity. Additionally, presence/absence surveys for California black rail would be conducted within the 900-foot noise buffer of pile driving activities.

4.4.3. California Freshwater Shrimp

California freshwater shrimp (*Syncaris pacifica*) is a federal and state endangered (USFWS 1988) species endemic to the lower reaches of perennial streams in Marin, Napa, and Sonoma counties. This species was listed as state endangered on October 2, 1980, and federally endangered on November 30, 1988. Freshwater shrimp are typically found in low elevation (less than 116 meters) and low gradient (less than one percent slope) creek habitat with structurally diverse banks (USFWS 1998). This species can also tolerate warm waters (i.e., greater than 23° Celsius [C]) and standing water, which may be detrimental or fatal to native salmonids (USFWS 1998). Freshwater shrimp can tolerate brackish water conditions, at least temporarily, with one study (Hedgpeth 1968) observing normal feeding and molting behaviors during a 13-day exposure to salinities of 16-17 ppt. Long-term exposure of adults to brackish or sea waters, however, may have effects on the population through impaired

reproduction, increased vulnerability to predators, and competition with salt-tolerant shrimps (USFWS 1998). Optimal habitat for freshwater shrimp is described as slow moving creeks, 30–90 centimeters (12-35 inches) deep with exposed alder and willow tree roots, undercut banks, exposed roots extending into the water, large and small woody debris to slow water and encourage deposition of organic detritus, and overhanging vegetation in the water (USFWS 1998).

California freshwater shrimp typically breed in the fall, and the females carry eggs through the winter, which hatch in May and June. California freshwater shrimp may mature after their second summer and may live more than three years (USFWS 1998).

4.4.3.1. SURVEY RESULTS

California freshwater shrimp primarily occur upstream of the BSA in Olema and Lagunitas creeks, although they have been found downstream of the White House Pool on Lagunitas Creek (NPS 2019). It is likely that California freshwater shrimp are carried downstream through the BSA during large flood events and attempt to colonize their new environs. During periods of low flow, salinities within lower reaches of Lagunitas and Olema creeks near the BSA rise and likely restrict colonization by freshwater shrimp. In addition, significant changes have occurred to aquatic habitat along the lower portion of Lagunitas Creek and Olema Creek after the permanent removal of a seasonal dam (Giacomini Dam) in 1998. Removal of this seasonal dam likely adversely affected the freshwater shrimp population in this area [see discussion below] (Fong 2000).

In 1996, a single adult was found in Olema Creek approximately 0.5 mile upstream of the confluence with Lagunitas Creek. In 1997, three more adults and one juvenile were found in the same location (CDFW 2024b; Fong 1999; Appendix A: figures 8 and 9). The 1997 data indicated that a possible reproducing shrimp population may be present year-round (Fong 1999). In 1999, a single survey was conducted, and no shrimp were observed (Fong 2000). Between these surveys (i.e., 1997 and 1999), the seasonal Giacomini Dam on Lagunitas Creek, located approximately 40 feet downstream of the BSA, was permanently removed (Fong 2000). When in place, the dam caused the lower portion of Olema Creek to "back up," effectively flooding normal flatwater or riffle habitats. The roots and branches of the woody riparian species (i.e., the freshwater shrimp habitat), which had developed under past summer water surface elevations were above the new summer water surface elevations (Fong 2000). Fong (2000) speculated that this change in hydrology was the reason no shrimp were captured during the survey

in 1999. He also speculated that shrimp could have moved further upstream in Olema Creek in response to this hydrologic change (Fong 2000); and, in 2002, seven shrimp were found in different, but unspecified, locations along lower Olema Creek (LoBianco and Fong 2003). It is uncertain whether or not freshwater shrimp have persisted in Olema Creek since that time (Larry Serpa, personal communication with Rob Aramayo on 5/7/15).

Based on structural characteristics, instream habitat conditions along Olema Creek within the BSA are generally suitable, but not optimal, for freshwater shrimp. Riparian conditions here include large concentrations of arroyo willow with an understory community of stinging nettles and poison oak. Previous work in Lagunitas Creek showed the highest concentration of freshwater shrimp along creek reaches consisting of stinging nettles, vine maple (*Acer circinatum*), and mint (*Mentha* sp.) (USFWS 1998). The portion of Olema Creek within the BSA contains small areas of habitat features suitable for the freshwater shrimp, including small areas of undercut banks, exposed willow roots, and coarse woody debris located under the bridge and downstream. While the structural characteristics of Olema Creek are marginally suitable for freshwater shrimp, it is important to note that fluctuating salinity conditions may reduce habitat suitability. During low flow periods (i.e., summer and fall), freshwater outputs into Lagunitas and Olema creeks decrease. During these periods, salinities within the BSA may rise in combination with daily tidal cycles and the reduced pulse of freshwater from upstream. The degree of salinity increase within Olema Creek or its potential effect on habitat suitability for freshwater shrimp is unknown at this time. However, Fong (1999) captured an individual freshwater shrimp downstream of the BSA in Lagunitas Creek at White House Pool (approximately 2,775 feet downstream) where salinities measured as high as 14.3 parts per thousand. During periods of highly saline conditions, their presence would be unlikely. However, they are known to occur upstream in Olema Creek and there is potential for individuals to move downstream into the BSA during low salinity conditions. Due to the presence of suitable habitat within the Project area and the know occurrences in Lagunitas Creek and Olema Creek, this species has a high potential to occur at the site.

4.4.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to California freshwater shrimp during Project construction. Species specific measures include limited work period within the creek (Measures #4), biological monitoring (Measure #14), creek bed and bank protection (Measure #18), aquatic riparian vegetation

protection (Measure #19), debris containment (Measure #21), and restoration (Measure #28). 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 downstream 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

Indirect impacts to freshwater shrimp may result from habitat exclusion and the placement of temporary and permanent fills within dispersal and foraging habitat. Project construction will take place outside of the species' breeding season. In the event that adult shrimp are located during preconstruction surveys or during Project activities, work will not start until the individual has left the Project area. Direct impacts could occur from potential relocation, should this species occur. 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, impacts are expected to be minimized. The installation of RSP may permanently alter 0.058 acre of habitat for this species. However, this would occur in a small portion of habitat compared to that available in the general region.

4.4.3.4. 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.

4.4.3.5. CUMULATIVE IMPACTS

Two past or planned future projects 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.

Both 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 California freshwater shrimp habitat that would be impacted by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to California freshwater shrimp as a result of the proposed Project.

4.4.4. Tidewater Goby

Tidewater goby (*Eucyclogobius newberryi*) are listed as endangered under the FESA (USFWS 1994) and are a California SSC (CDFW 2024a). They occur from the Agua Hedionda Lagoon, San Diego County, in the south to the mouth of the Smith River, Del Norte County, in the north (Moyle 2002; USFWS 2013). Tidewater gobies are a benthic fish that inhabits shallow lagoons and the lower reaches of coastal streams with fresh and brackish water. Often, these coastal lagoons form a sandbar during the summer. They prefer slow-moving or fairly still, but not stagnant, water, and avoid areas with strong wave action or strong currents. They need backwater and marshy habitats to avoid being scoured away during winter flood flows.

Tidewater gobies may breed throughout the year but have a peak spawning period from late August to November in central California. They prefer water temperatures from 13.5-21° C for breeding (Wang 1982). Tidewater gobies are mostly an annual species, although they may live to three years in the northern part of the range. Their diet consists mostly of small benthic crustaceans, aquatic insects, and mollusks.

4.4.4.1. CRITICAL HABITAT

Critical habitat was established for tidewater goby in 2013 (USFWS 2013). Under FESA, the USFWS is required to identify the physical or biological features essential to the conservation of the tidewater goby within critical habitat areas. These physical or biological features are referred to as primary constituent elements (PCEs). The PCEs specific to the tidewater goby are: persistent, shallow (in the range of approximately 0.3 to 6.6 feet), still-to-slow-moving lagoons, estuaries, and coastal streams with salinity up to 12 ppt, which provide adequate space for normal behavior and individual and population growth that contain one or more of the following: (a) substrates (e.g., sand, silt, mud) suitable for the construction of burrows for reproduction; (b) submerged and emergent aquatic vegetation, such as *Potamogeton pectinatus, Ruppia maritima, Typha latifolia*, and *Scirpus* spp., that provides protection from predators and high flow events; or (c) presence of a sandbar across the mouth of a lagoon or estuary during the late spring, summer, and fall that closes or partially closes the lagoon or estuary, thereby providing relatively stable water levels and salinity (USFWS 2013).

4.4.4.2. SURVEY RESULTS

Tidewater gobies once occurred near the mouth of Walker and Lagunitas creeks in Tomales Bay, although they appear to have been extirpated from these locations. Surveys in 2002 found them in Tomasini Creek (Avocet Research Associates 2002).

The Lagunitas Creek estuary, including Tomasini Creek, has been listed as critical habitat for tidewater goby (USFWS 2013). Critical habitat for tidewater goby includes the tidal portions of Lagunitas Creek adjacent to the BSA but does not include Olema Creek (Appendix A: Figure 11). The BSA appears to be at the upper edge of the tidally influenced portion of Lagunitas Creek. The Lagunitas Creek estuary does not form a sandbar during the summer. Nonetheless, tidewater gobies are known to occur within the estuary. The instream habitat within the BSA is mostly open channel, with sediments suitable for tidewater gobies to construct burrows. There is submerged and emergent vegetation present to provide shelter, but only a small amount.

Tidewater gobies have only been found in Tomasaini Creek within the Lagunitas Creek estuary, which is on the eastern edge of the estuary. It is believed that tidewater gobies will be able to recolonize more of the estuary as the habitat is restored. However, it is likely to take considerable time for them to colonize the upper reaches of Lagunitas Creek or lower Olema Creek.

For the reasons described above, the potential for tidewater goby to occur in the BSA is considered to be moderate. The BSA is adjacent to critical habitat.

4.4.4.3. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to tidewater gobies during Project construction. Species specific measures include limited work period within the creek (Measures #4), biological monitoring (Measure #14), creek bed and bank protection (Measure #18), aquatic riparian vegetation protection (Measure #19), debris containment (Measure #21), and restoration (Measure #28). 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 downstream to suitable habitat away from the construction area according to USFWS protocol and by an agency-approved biologist with a handling permit.

4.4.4.4. PROJECT IMPACTS

If tidewater gobies are present in the BSA, direct impacts to this species from temporary disturbances are anticipated during fish relocation, creek dewatering, and a temporary increase in sediment mobilization. Fish relocation efforts could result in injury or mortality. Other direct impacts to tidewater gobies include temporary loss of suitable habitat during the construction period.

Direct impact to tidewater goby habitat includes permanent and temporary impacts to the creek bed and banks and associated vegetation community. 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.

Unavoidable indirect impacts to tidewater goby and habitat may include competition with other fish at relocation sites; increases in downstream turbidity during the removal of the creek diversion 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 0.058 acre of net permanent impacts will result from the placement of fill in tidewater goby habitat where RSP is installed below the OHWM. The widened bridge deck would increase permanent shading over Olema Creek by approximately 0.022 acre. Other potential permanent impacts to tidewater gobies 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 0.151 acre of tidewater goby habitat, including 0.007 acre of critical habitat, would experience temporary impacts during construction. Temporary impacts include construction 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. Critical habitat will only be impacted by construction access while building the downstream berm.

An impact to critical habitat must not adversely modify the critical habitat to the point that it no longer will aid in the species' recovery. The temporary impacts to 0.007 acre of critical habitat are minor compared to the entire area of critical habitat. Due to the nominal disturbance to critical habitat within the proposed action area, the County does not anticipate an adverse modification to critical habitat.

Following construction, the creek's flow, bed, and banks will be generally restored to previous conditions. While RSP will be placed in the creek, the Project provides an overall improvement by widening the bridge and removing the existing piers and abutments from the creek.

4.4.4.5. COMPENSATORY MITIGATION

Impacts to tidewater goby from the Project are anticipated to be minor and would be minimized further by the proposed Project AMMs. Coordination and consultation with USFWS will determine any further compensatory mitigation for this species.

4.4.4.6. CUMULATIVE IMPACTS

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

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

4.4.5. Southern Coastal Roach

Southern coastal roach (*Hesperoleucus venustus subditus)* [formerly considered in CNDDB as Tomales roach (*Lavinia symmetricus* ssp. 2)] and is a California SSC (CDFW 2024a and CDFW 2024b). 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° C) 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

Southern coastal (formerly Tomales) roach occur in the tributaries of Tomales Bay, including Olema Creek (Michael Reichmuth, pers comm on 9/3/2015). However, the potential for occurrence of roach within the BSA is uncertain, since roach are not typically found in brackish water, as is found here. No southern coastal (formerly Tomales) roach were captured during 2001 and 2002 surveys for California freshwater shrimp and tidewater goby in the Lagunitas Creek estuary (adjacent to the BSA) conducted by the NPS (Fong 2002). Nonetheless, southern coastal (formerly Tomales) roach are abundant in Olema Creek and may occur in the BSA, at least seasonally.

For the reasons described above, the potential for southern coastal (formerly Tomales) roach to occur in the BSA is considered to be moderate.

4.4.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to southern coastal (formerly Tomales) roach during Project construction. Species-specific measures include work period (Measure #4), preconstruction surveys (Measure #7), biological monitoring (Measure #14), water diversion and dewatering (Measure #16), creek bed and bank protection (Measure #18), fish and wildlife refugia protection (Measure #20), debris containment (Measure #21), 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.

4.4.5.3. PROJECT IMPACTS

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, etc.). 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 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 0.058 acre of net permanent impacts will result from the placement of fill in southern coastal (formerly Tomales) roach habitat where RSP is installed below the OHWM. The widened bridge deck would increase permanent shading over Olema Creek by approximately 0.022 acre. 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 0.151 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

Southern coastal (formerly Tomales) roach is not protected under any regulation that would require compensatory mitigation.

4.4.5.5. CUMULATIVE IMPACTS

Two past or planned future projects had, or have, the potential to affect southern coastal (formerly Tomales) roach. A brief summary of the known projects is provided in Section 4.1.1.5.

Both 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 southern coastal (formerly Tomales) roach habitat being impacted by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to southern coastal (formerly Tomales) roach as a result of the proposed Project.

4.4.6. Coho Salmon – Central California Coast (CCC) ESU

The CCC Coho ESU 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 in 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 first full 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°C for extended periods of time; however, some data suggests that the upper thermal limit may be closer to 18°C (Moyle 2002).

In California, most coho remain in the ocean for their second and third years, before returning as adults at the end of their third year (CDFW 2002). Some males have been observed to return as two-year-old 'jacks.' All coho adults die after spawning.

4.4.6.1. CRITICAL HABITAT

Critical habitat for CCC coho was designated on May 5, 1999 (NMFS 1999), and EFH was designated August 1999. The PCEs include spawning sites, food resources, water quality and quantity, and riparian vegetation. Critical habitat for this species includes all rivers (including estuarine areas and tributaries) between Punta Gorda and the San Lorenzo River (inclusive) in California (NMFS 1999).

4.4.6.2. SURVEY RESULTS

The BSA is within the historic and current range of coho. The BSA does not contain the instream habitat features for salmonid spawning; all spawning habitat in Olema Creek occurs upstream. Juvenile coho typically reside in freshwater for at least one full year before emigrating to the ocean. Most of this natal rearing is expected to occur upstream of the BSA, however, juveniles could occur within the BSA at any time of the year. Juveniles may linger within the BSA during the smoltification process when they are undergoing the physiological adaptations to live in salt water. Adults will also move through the area during their upstream migration. NPS surveys of Coho conducted in the past five years counted varying numbers of smolts passing through the BSA, with a high of 1,154 smolt recorded in 2017, followed by 38 in 2018, and 318 in 2021 (NPS 2022).

For the reasons described above, the potential for the CCC Coho ESU to occur in the BSA is considered to be high. The BSA is within the Tomales-Drake Bays Critical Habitat Hydrologic Unit for the CCC Coho ESU (Appendix A: Figure 11; NMFS 1999). The BSA is also within the Tomales-Drakes Bay EFH Hydrologic Unit (USGS Hydrologic Unit # 18050005).

4.4.6.3. 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 limited work period within the creek (Measures #4), biological monitoring (Measure #14), creek bed and bank protection (Measure #18), aquatic riparian vegetation protection (Measure #19), debris containment (Measure #21), and restoration (Measure #28). 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 downstream to suitable habitat away from the construction area according to USFWS protocol and by an agency-approved biologist with a handling permit.

4.4.6.4. 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 three 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 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.

Critical habitat is present in Olema and Lagunitas creeks throughout the Project area. Approximately 0.058 acre of net permanent impacts will result from the placement of fill in critical habitat where RSP is installed below the OHWM. The widened bridge deck would increase permanent shading over Olema Creek by approximately 0.022 acre. Other potential permanent impacts to coho critical habitat 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 0.151 acre of coho critical 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.

An impact to critical habitat must not adversely modify the critical habitat to the point that it no longer will aid in the species' recovery. The net permanent impacts to 0.058

acre and temporary impacts to 0.151 acre of critical habitat is minor compared to the entire area of critical habitat. Following construction, the creek's flow, bed, and banks will be generally restored to previous conditions. While RSP placed in the creek is considered a permanent impact, fish may be able to use gaps in the rocks to rest or hide. The Project also provides an overall improvement by widening the bridge and removing the existing piers and abutments from the creek. Additionally, RSP will not be placed in suitable spawning habitat, as there is none present at the site. Given that there will be dewatering activities associated with the project within critical habitat of coho (federally listed fish species), the County anticipates the determination to be 'may affect, likely to adversely affect' to critical habitat.

4.4.6.5. COMPENSATORY MITIGATION

The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge. 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.

4.4.6.6. CUMULATIVE IMPACTS

Two past or planned future projects had, or have, the potential to coho salmon. A brief summary of the known projects is provided in Section 4.1.1.5.

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

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

The CCC 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 2005a). The range of this DPS is defined by NMFS as all naturally spawned populations from the Russian River in Sonoma and Mendocino counties 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 the ocean 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° C 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 salmon, steelhead do not necessarily die after spawning.

4.4.7.1. CRITICAL HABITAT

Critical habitat for the CCC steelhead DPS was designated on May 5, 1999, and revised Sept 5, 2005. The PCEs include the following (NMFS 2005a):

1. Freshwater spawning sites.

2. Freshwater rearing sites with water quantity and floodplain connectivity.

3. Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

4. Estuarine areas free of obstruction with water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater.

5. Nearshore marine areas free of obstruction with water quality and quantity conditions and forage.

6. Offshore marine areas with water quality conditions and forage.

4.4.7.2. SURVEY RESULTS

The BSA is within the historic and current range of steelhead. The portions of Olema Creek suitable for steelhead spawning occur upstream of the BSA. Most of the juvenile rearing is also expected to occur upstream of the BSA. The physiological changes necessary for the fish to adapt to living in salt water is extreme, and therefore they are unlikely to occur within this tidally influenced reach except during periods of low salinity or during the smoltification process when the fish are emigrating. The BSA is within a known migratory corridor and juveniles may occur there.

For the reasons described above, the potential for CCC steelhead to occur in the BSA is considered to be high. The BSA is within the Marin Coastal Critical Habitat Hydrologic Unit 2201 (Appendix A: Figure 8), which is the same as the USGS Hydrologic Unit # 18050005 (NMFS 2005b).

4.4.7.3. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to steelhead during Project construction. Species specific measures include limited work period within the creek (Measures #4), biological monitoring (Measure #14), creek bed and bank protection (Measure #18), aquatic riparian vegetation protection (Measure #19), debris containment (Measure #21), and restoration (Measure #28). 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 downstream to suitable habitat away from the construction area according to USFWS protocol and by an agency-approved biologist with a handling permit.

4.4.7.4. 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 three 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, etc.). 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.

Critical habitat for steelhead is present in Olema and Lagunitas creeks throughout the Project area. Approximately 0.058 acre of net 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 Olema Creek by approximately 0.022 acre. Other potential permanent impacts to steelhead critical habitat 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 0.151 acre of steelhead critical 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.

An impact to critical habitat must not adversely modify the critical habitat to the point that it no longer will aid in the species' recovery. The permanent impacts to 0.058 acre and temporary impacts to 0.151 acre of critical habitat are minor compared to the entire area of critical habitat. Following construction, the creek's flow, bed, and banks will be generally restored to previous conditions. While RSP placed in the creek is considered a permanent impact, fish may be able to use gaps in the rocks to rest or hide. The Project also provides an overall improvement by widening the bridge and removing the existing piers and abutments from the creek. Additionally, RSP will not be placed in suitable spawning habitat, as there is none present at the site. Given that dewatering activities will take place within critical habitat of steelhead (federally listed fish species), the County anticipates the determination to be 'may affect, likely to adversely affect' to critical habitat.

4.4.7.5. COMPENSATORY MITIGATION

The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge. 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.

4.4.7.6. CUMULATIVE IMPACTS

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

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

4.4.8. California Red-legged Frog

The California red-legged frog was federally listed as a threatened species on May 23, 1996 (USFWS 1996b). It is also a California SSC (CDFW 2024a).

California red-legged frog occurs 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 2010).

California red-legged frogs 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 two miles from suitable aquatic breeding habitat (USFWS 2002).

Introduced species such as bullfrogs (*Rana* [*Lithobates*] *catesbeiana*), largemouth bass (*Micropterus salmoides*), common carp (*Cyprinus carpio*), and mosquitofish (*Gambusia affinis*) may prey upon one or more life stages (eggs, tadpoles, juveniles, or adults) of California red-legged frog (Stebbins and McGinnis 2012).

4.4.8.1. CRITICAL HABITAT

Revised critical habitat for this species was designated by USFWS on March 17, 2010 (USFWS 2010). Primary constituent elements for California red-legged frogs include aquatic breeding habitat, non-breeding freshwater pond and stream habitats, upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat, accessible upland or riparian dispersal habitat within and between occupied or previously occupied sites that are located within 1 mile of each other, and that support movement between such sites.

4.4.8.2. SURVEY RESULTS

The BSA is within the historic and current range of California red-legged frogs (USFWS 2002). The proposed Project is within the boundary of the Pt. Reyes Peninsula Recovery Unit (USFWS 2002) and Critical Habitat Unit MRN-3 (USFWS 2010; Appendix A: Figure 11). A large number of California red-legged frogs are known to occur in Olema Valley and Olema Marsh (USFWS 2002; CDFW 2024b; Fellers and Kleeman 2007; Appendix A: figures 8b and 9). There is a CNDDB occurrence immediately south of the BSA (Appendix A: figures 8 and 9; CDFW 2024b). The site consists of Olema Creek, Olema Marsh, and an unnamed pond north-northeast of Olema Marsh. The unnamed pond north-northeast of Olema Marsh is approximately 415 feet from the BSA. In 1995, 11 larvae and two egg masses were observed in this pond by Gary Fellers (CNDDB 2024b).

Between July 2007 and February 2008, two freshwater ponds totaling approximately 0.73 acre were created approximately 40 feet east and 125 feet southeast of the existing pond, approximately 591 feet and 196 feet south of the BSA, respectively. These ponds were created to mitigate for potential impacts caused by the Giacomini Wetland Restoration Project (NPS 2006). Breeding has been confirmed in both of these ponds, but they are also occupied by bullfrogs which has impacted the California red-legged frog population (P. Kleeman email communication to R. Doubledee on 9/3/2015).

California red-legged frogs use Olema Creek as non-breeding habitat (Fellers and Kleeman 2007). There is no clear evidence that the species breeds in Olema Creek, and egg mass surveys have not been conducted along the lower portion of Olema Creek; however, it is possible that there are places where breeding occurs (P. Kleeman email communication to R. Doubledee on 9/3/2015). California red-legged frog tadpoles have been found in fish traps in Olema Creek, but there are also known breeding sites that are hydrologically connected to Olema Creek, so it cannot be determined if the tadpoles found were from egg masses laid in Olema Creek or in the wetlands connected to Olema Creek.

Olema Creek and the adjacent waters within the BSA are tidally influenced. The salinity levels may fluctuate above the tolerance levels for egg masses and tadpoles making it unlikely breeding habitat. California red-legged frogs reportedly do not breed successfully in waters with salinities higher than 4.5 ppt (Jennings and Hayes 1990), and salinities exceeding 7.5 ppt are believed to be lethal to tadpoles (Jennings and Hayes 1990). In a 2001 study of California freshwater shrimp and tidewater goby, Fong (2003) measured salinity on Lagunitas Creek above White House Pool and found it to range from 14.3 ppt at a depth of 3 feet to 4.5 ppt at the surface. The salinity range in the adjacent wetland within the BSA is likely lower than at pool, but may still exceed the tolerance levels for California red-legged frog egg masses and tadpoles. Adults have been found in higher salinities than tadpoles and are able to move out of the water if salinity levels rise above their tolerance level.

Fellers and Keelman (2007) found that most frogs move away from breeding sites, but only a few move farther than the nearest suitable non-breeding habitat. The arroyo willow thicket, the adjacent wetland, and Olema Creek within the BSA represent non-breeding habitat immediately north of a known breeding site (the unnamed pond and two additional mitigation ponds). It is likely that adults and juveniles move away from these breeding ponds and forage in the willow thicket or in the adjacent waters within the BSA. Fellers and Keelman (2007) found frogs during the day under blackberry thickets interspersed with poison oak and stinging nettles in riparian areas. Adults may also use the aquatic habitat in Olema Creek when salinity levels are low. California red-legged frogs have been found basking in full sun immediately adjacent to the water in non-breeding riparian areas (Fellers and Keelman 2007).

For the reasons described above, the potential for California red-legged frogs to occur in the BSA is considered to be high. The BSA is within Critical Habitat Unit MRN-3

and contains at least the PCE of non-breeding aquatic and riparian habitat (USFWS 2010). The variation in salinity levels suggests that the BSA and adjacent waters are not suitable breeding habitat.

4.4.8.3. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to California red-legged frogs during Project construction. Species-specific measures include preconstruction herpetofauna surveys (Measures #7 and #13), biological monitoring (Measure #14), creek bed and bank protection (Measure #18), aquatic riparian vegetation protection (Measure #19), fish and wildlife refugia protection (Measure #20), debris containment (Measure #21), prevention of wildlife entrapment (Measure #24), material storage (Measure #26), and restoration (Measure #28). 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.

4.4.8.4. PROJECT IMPACTS

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

As a result, direct effects to habitat for California red-legged frogs could occur. Approximately 0.058 acre of net permanent impacts will result from the placement of fill in California red-legged frogs aquatic dispersal habitat where the new bridge abutments are installed and where RSP is installed below the OHWM. Approximately 0.814 acre of California red-legged frogs upland and aquatic habitat would experience temporary impacts during construction. Figure 4 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.

There are no effects expected to breeding habitat as Olema Creek is considered unsuitable for breeding due to salinity levels. The work will be conducted during the

dry season, when adult California red-legged frogs are not expected to be dispersing through the BSA.

Direct effects to individual California red-legged frogs may occur throughout the BSA 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 BMPs.

An impact to critical habitat must not adversely modify the critical habitat to the point that it no longer will aid in the species' recovery. There is a total of 3.481 acre of critical habitat within the BSA. The Project will result in approximately 0.6 acre of permanent impacts and 0.97 temporary impacts to California red-legged frog critical habitat, which is minor compared to the entire area of critical habitat Unit MRN-3. Following construction, the creek's flow, bed, and banks will be generally restored to previous conditions. While RSP will result in permanent impacts to the creek, the Project provides an overall improvement by widening the bridge and removing the existing piers and abutments from the creek. Additionally, RSP will not be placed in suitable breeding habitat, as there is none present at the site. The Project will not diminish the use of this area for California red-legged frog dispersal. Due to the above factors, The County does not anticipate an adverse modification to critical habitat.

4.4.8.5. COMPENSATORY MITIGATION

The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge. 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 impacts to California red-legged frogs.

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

4.4.8.6. CUMULATIVE IMPACTS

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

Two past or planned future projects within or near the BSA had or have the potential to affect California red-legged frogs. 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 BSA provides only aquatic dispersal habitat and upland for the species. 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 California red-legged frogs in the region. 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 California red-legged frogs as a result of the proposed Project.

4.4.9. Northwestern Pond Turtle

The northwestern pond turtle (*Actinemys marmorata*) is a federally proposed threatened species and California SSC (IPAC 2024; CDFW 2024a). Northwestern pond turtles range throughout California, from southern coastal California and the Central Valley, north to the Cascade and eastern Sierra Nevada mountain ranges. Northwestern 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 200 meters (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).

4.4.9.1. SURVEY RESULTS

The only CNDDB occurrence of northwestern pond turtle within five miles was recorded in 2003 just south of Olema Marsh, and approximately 0.3 mile south of the

BSA (CDFW 2024b; Appendix A: Figure 8). Northwestern pond turtles were found to be relatively abundant in restored wetlands at the south end of Tomales Bay (Avocet Research Associates 2002).

Aquatic habitat for northwestern pond turtles is present within the BSA, and they may forage within Olema Creek. Some basking habitat is present on gravel or sandbars that are exposed during low tide, though these become submerged at high tide. The shading from the dense overhanging riparian vegetation along the banks of Olema Creek severely limits the available basking habitat within the BSA, which is essential for this species to persist. Northwestern pond turtles may use Olema Creek as a dispersal corridor between other more suitable habitats such as Olema Marsh and Lagunitas Creek. Based on the presence of suitable aquatic habitat and their known presence in the region, northwestern pond turtles are considered to have a high potential to occur within the BSA.

4.4.9.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to northwestern pond turtle during Project construction. Species-specific measures include preconstruction surveys (Measure #7), biological monitoring (Measure #14), creek bed and bank protection (Measure #18), aquatic riparian vegetation protection (Measure #19), fish and wildlife refugia protection (Measure #20), debris containment (Measure #21), 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.

4.4.9.3. PROJECT IMPACTS

The activity most likely to have direct impacts on this species is the temporary diversion of Olema Creek. As northwestern 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.

4.4.9.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed for the northwestern 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.

4.4.9.5. CUMULATIVE IMPACTS

Northwestern 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. Two past or planned future projects within or near the PCA had or have the potential to affect northwestern pond turtle. A brief summary of the known projects is provided in Section 4.1.1.5. Both 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 northwestern pond turtle by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to northwestern pond turtle as a result of the proposed Project.

4.4.10. Tricolored Blackbird

The tricolored blackbird (*Agelaius tricolor*) was listed as a threatened species under CESA in March of 2019. Tricolored blackbirds nest colonially with up to 30,000 pairs simultaneously inhabiting large, continuous patches of marsh or shrub habitat near water. Typically, they will nest in large freshwater marshes dominated by cattails or bulrush, but they are often found in agricultural fields growing wheat or grain, and in thickets of Himalayan blackberry (*Rubus armeniacus*). They forage primarily on insects, taking advantage of large outbreaks such as locust swarms when they are available (Shuford and Gardali 2008). This species has seen major populations declines as wetland habitats have been converted for agricultural uses and was given emergency protection under the CESA when the population declined by 44 percent in just three years from 2011 to 2014 (CDFW 2018). The emergency listing status was allowed to expire by the CFGC, but there is a petition to the USFWS to list the species under the FESA.

4.4.10.1. SURVEY RESULTS

There are no recorded occurrences of tricolored blackbird in the CNDDB within 5 miles of the BSA, but a colony was reported on the east shore of Tomales Bay at Cypress Grove in 2005 (ICE 2015) at a distance of approximately 8.5 miles from the BSA.

Suitable breeding habitat for the species is present in nearby Olema Marsh, and any individuals nesting there may use the BSA as foraging habitat due its proximity to the marsh.

Based on the presence of suitable foraging habitat on site and suitable nesting habitat in the vicinity, tricolored blackbirds are considered to have a moderate potential to occur within the BSA.

4.4.10.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to tricolored blackbird during Project construction. Species-specific measures include preconstruction surveys (Measure #7), nesting bird window (Measure #9), nesting bird surveys (Measure #10), and biological monitoring (Measure #14). If an active nest or nesting colony is found during surveys, a qualified biologist will implement a no work buffer in consultation with resource agencies.

4.4.10.3. PROJECT IMPACTS

The Project is not expected to adversely impact tricolored blackbird.

4.4.10.4. COMPENSATORY MITIGATION

No compensatory mitigation is proposed for tricolored blackbird. Implementation of the general AMMs will serve as a means to offset any potential impacts to the species.

4.4.10.5. CUMULATIVE IMPACTS

Two past or planned future projects had, or have, the potential to tricolored blackbird. A brief summary of the known projects is provided in Section 4.1.1.5. Both 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 tricolored blackbird habitat being impacted by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to tricolored blackbird as a result of the proposed Project.

4.4.11. California Black Rail

The California black rail (*Laterallus jamaicensis coturniculus*) is a state-listed threatened species, and also a California Fully Protected species. Although this species prefers pickleweed-dominated marsh habitat, they can also be found in freshwater and brackish marshes as well (Evans et al. 1991). Black rails can colonize isolated marshes, including restored marsh habitats, suggesting that large, contiguous marshes are not a

requirement for occupancy. Nests are typically concealed in dense vegetation, often pickleweed and tall grasses, near the upper limits of tidal flooding zones.

California black rail occurs at a number of sites in the San Francisco Bay Area, although they are more concentrated in the northern part of the region (Evans et al. 1991). California black rails appear to prefer tidal salt marshes with a heavy canopy of pickleweed and an open structure below the canopy for nesting and ease of movement (Evans et al. 1991). In freshwater marshes, rails are usually found in areas with dense stands of bulrush, cattail, and/or saltgrass. Along the Pacific coast, black rails appear to tolerate tidal marsh communities with higher flooding potential provided there is suitable upper wetland zones or adjacent upland vegetation for refugia (Eddleman et al. 1994).

4.4.11.1. SURVEY RESULTS

There are three occurrences of California black rail recorded in the CNDDB within two miles of the BSA (CDFW 2024b; Appendix A: Figure 8). The closest was recorded in 1977 in Olema Marsh, 0.6 mile south of the BSA. The other occurrences are located north of the BSA in Tomales Bay Ecological Reserve and the marshes along the fringes of Tomales Bay. The population of California black rails in Olema Marsh appears to be intermittent, as the 1993 Marin County Breeding Bird Atlas noted that the species had not been found there since the early 1980s (Shufford 1993). Point count and callback surveys in Olema Marsh also failed to locate this species in 2004 (Stallcup and Kelly 2005). The California black rail population in Tomales Bay Ecological Reserve at the south end of Tomales Bay does seem to be persisting, as evidenced by recent surveys (Avocet 2019).

Habitat within the BSA is marginal for California black rails. There is no extensive pickleweed marsh, and the freshwater marsh habitat on site is restricted to small patches of tules that are not large enough to harbor a resident population of black rails. However, black rails occurring in more suitable habitats in nearby Olema Marsh or the Tomales Bay Ecological Reserve may occasionally forage or disperse through the BSA.

Recent California black rail surveys conducted on behalf of Point Reyes National Seashore in the Tomales Bay wetlands to the north of the Project between 2016 and 2019 (Avocet Research Associates 2019). The majority of the occurrences were over 0.22 mile northwest of the Project area. One individual was detected in 2019 approximately 0.17 mile northeast of the Project. However, this detection was

considered anomalous, as it was in an isolated patch of sedges at a time when relatively high tides were occurring and thus it was assumed that this bird was taking temporary refuge from the high tide. This area is separated from the Project by a row of residences, along with riparian and landscaped trees.

Based on the presence of known populations nearby and the presence of suitable foraging/dispersal habitat, California black rails are considered to have a moderate potential to occur within the BSA. However, they are much more likely to occur in the suitable habitat to the north instead of in the Project area.

4.4.11.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3 will reduce the potential for impacts to California black rail during Project construction. Species-specific measures include preconstruction surveys (Measure #7), monthly focused black rail surveys (Measure #8), nesting bird window (Measure #9), nesting bird surveys (Measure #10), and biological monitoring (Measure #14). If an active nest is found during surveys, a qualified biologist will implement a no work buffer in consultation with resource agencies.

4.4.11.3. PROJECT IMPACTS

As habitat within the BSA is only moderately suitable for California black rail, they are not likely to utilize the habitat for extended periods of time. Temporary effects to a potentially present California black rail population include noise and presence of construction activities, which will be limited to a relatively small area in relationship to the Olema Marsh habitat available.

It is expected that noise impacts from pile driving would attenuate to near ambient levels at approximately 900 feet from the Project. Presence/absence surveys for California black rail would be conducted within the 900-foot noise buffer of pile driving activities to prevent noise impacts to nesting rails.

4.4.11.4. COMPENSATORY MITIGATION

All disturbed areas on-site will be restored with an assemblage of native species. No compensatory mitigation is proposed for California black rail.

4.4.11.5. CUMULATIVE IMPACTS

Two past or planned future projects had, or have, the potential to California black rail. A brief summary of the known projects is provided in Section 4.1.1.5.

Both 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 California black rail habitat being impacted by the proposed Project are expected to be minimal. The County does not anticipate any unmitigated cumulative effects to California black rail as a result of the proposed Project.

4.4.12. San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat (*Neotoma fuscipes*) is a California SSC 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, 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).

4.4.12.1. SURVEY RESULTS

The BSA, which includes riparian habitat, serves as prime habitat for the woodrat. During the 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 woodrats 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 high potential to occur within the BSA.

4.4.12.2. 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 #14), and worker environmental awareness training (Measure #15). If an individual is found during preconstruction surveys, work will not commence until the individual leaves the work area of its own volition.

4.4.12.3. 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.

4.4.12.4. 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 middens that will be affected by the proposed Project.

4.4.12.5. 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 midden 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.

4.4.13. Migratory Bird Species

Under the federal 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*).

4.4.13.1. SURVEY RESULTS

Migratory bird species may nest anywhere within the BSA except for paved road surfaces. 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, an active black phoebe nest with at least three nestlings was observed on a vertical surface of east bridge pier. The black phoebe is a common bird species that does not have special status but is covered by the MBTA. Other common bird species covered by the MBTA such as house finch 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
- Northern harrier (*Circus cyaneus*), a California Species of Special Concern
- White-tailed kite (*Elanus leucurus*), a California Fully Protected Species
- Salt marsh common yellowthroat (*Geothlypis trichas sinuosa*), a California Species of Special Concern
- Osprey (*Pandion haliaetus*), included on CDFW's Special Animals List
- Yellow warbler (*Setophaga petechia*), a California Species of Special Concern
- Rookery sites of wading birds including:

- Great blue heron (*Ardea herodias*), included on CDFW's Special Animals List
- Great egret (*Ardea alba*), included on CDFW's Special Animals List
- Snowy egret (*Egretta thula*), included on CDFW's Special Animals List
- Black-crowned night heron (*Nycticorax nycticorax*), included on CDFW's Special Animals List

4.4.13.2. AVOIDANCE AND MINIMIZATION EFFORTS

The AMMs listed in Section 1.3, including a work window for nesting birds (Measure #9), preconstruction nesting bird surveys (Measure #10), implementation of non-disturbance buffers (Measure #11), and biological monitoring (Measure #14) will reduce the potential for effects to nesting birds during Project construction.

4.4.13.3. 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.

4.4.13.4. COMPENSATORY MITIGATION

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

4.4.13.5. 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.

4.4.14. 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. Day and maternity roosts tend to be well-hidden and maternity roosts 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.

4.4.14.1. SURVEY RESULTS

The Sir Francis Drake Blvd Bridge is a concrete two-pier design with few recessed areas on the underside. There is no day or maternity roosting habitat anywhere on the bridge because the concrete is fully sealed with no apparent cracks, crevasses, or gaps that could accommodate a bat colony.

The riparian corridor surrounding the Sir Francis Drake Blvd Bridge provides suitable foraging habitat for numerous bat species, though no very large trees of the type associated with large bat roosts were observed within the BSA. Foliage-roosting bats may also use the dense canopy of trees within and adjacent to the BSA for roosting.

Nine 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.

4.4.14.2. PALLID BAT

The pallid bat (*Antrozous pallidus*) is a California SSC (CDFW 2024a). 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 from foliage. Prey species include beetles, orthopterans, homopterans, moths, spiders, scorpions, and solpugids (Bolster 1998). 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 2008).

There are five occurrences of pallid bat recorded within five miles of the BSA (CDFW 2024b, Appendix A: Figure 8). The closest is a historical occurrence recorded in 1940, approximately 1.4 miles northeast of the BSA.

Suitable foraging habitat for pallid bats is present within the BSA, and this species likely travels throughout the riparian corridor of Olema and Lagunitas creeks hunting insects. Suitable day roost habitat is present within trees in the riparian corridor, but no very large trees of the type typically associated with pallid bat roosts are present within the BSA. There is no suitable day roosting habitat on the Sir Francis Drake Blvd Bridge, because the concrete is fully sealed and there are no cracks or crevasses. There is suitable night roost habitat on the underside of the bridge, though it is marginal in quality because there are few recessed spaces that could trap heat and protect roosting bats from exposure.

Based on their known presence in the region and the presence of suitable foraging habitat, pallid bats are considered to have a high potential to occur within the BSA, though they are not likely to roost on the Sir Francis Drake Blvd Bridge itself.

4.4.14.3. TOWNSEND'S BIG-EARED BAT

Townsend's big-eared bat (*Corynorhinus townsendii*) is a California SSC and is also a candidate for listing as Threatened or Endangered under the CESA (CFGC 2013; CDFW 2024a). 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 occasionally been observed roosting in cavities in very large trees (Fellers and Pierson 2002). This species is highly sensitive to disturbance at roost sites (CDFW 2008). 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.

There are four occurrences of Townsend's big-eared bat within five miles of the BSA (CDFW 2024b, Appendix A: Figure 8). The closest occurrence was recorded in 1951 and partially overlaps the western portion of the BSA but the exact location is unknown.

Suitable foraging habitat for Townsend's big-eared bats is present within the BSA and throughout the surrounding riparian corridor of Olema and Lagunitas creeks. There are no large trees within the BSA typical of the type used by Townsend's big-eared bats for roosting. There is no suitable day roosting habitat on the Sir Francis Drake Blvd Bridge, because the concrete is fully sealed and there are no cracks or crevasses. There is suitable night roost habitat on the underside of the bridge, though it is marginal in quality because there are few recessed spaces that could trap heat and protect roosting bats from exposure.

Based on their known presence in the region and the presence of suitable foraging habitat, Townsend's big-eared bats are considered to have a high potential to occur within the BSA, though they are not likely to roost on the Sir Francis Drake Blvd Bridge itself.

4.4.14.4. SILVER-HAIRED BAT

The silver-haired bat (*Lasionycteris noctivagans*) is included on CDFW's California State Special Animals List (CDFW 2024a). 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 in the Sierra Nevada. Silver-haired bats 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 are two occurrences of silver-haired bat recorded in the CNDDB within five miles of the BSA (CDFW 2024b, Appendix A: Figure 8). The closest record was documented in 1904 in the town of Olema, approximately 1.5 miles south of the BSA.

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, but considering the lack of recent CNDDB records, silver-haired bats are considered to have a moderate potential to occur within the wooded portion of the BSA.

4.4.14.5. WESTERN RED BAT

The western red bat (*Lasiurus frantzii*) is a California SSC (CDFW 2024a). 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 is one CNDDB occurrence of western red bat within five miles of the BSA. The occurrence was recorded in 2003 near the town of Olema, approximately 1.5 miles south of the BSA (CDFW 2024b).

There is suitable roosting habitat for western red bats in riparian vegetation throughout the BSA, and they may forage anywhere within the BSA and surrounding riparian corridor. This species roosts exclusively in foliage, and is not expected to roost on the bridge itself.

Based on the presence of suitable foraging and tree roosting habitat, western red bats are considered to have a moderate potential to occur within the BSA.

4.4.14.6. HOARY BAT

The hoary bat (*Lasiurus cinereus*) is included on CDFW's California State Special Animals List (CDFW 2024a). 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 2024b). 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 are four historical occurrences of hoary bat recorded in the CNDDB within five miles of the BSA. The closest was recorded in 1949 on Inverness Ridge, approximately 2.3 miles northwest of the BSA. Another was recorded in 1922 approximately 3 miles to the west, another occurrence was recorded in 1933, and another in 1954 approximately three miles to the south (CDFW 2024b).

There is suitable roosting habitat for hoary bats in trees throughout the BSA, and they may forage anywhere within the BSA and surrounding riparian corridor. This species roosts exclusively in foliage and is not expected to roost on the bridge itself.

Based on the presence of suitable foraging and tree roosting habitat, hoary bats are considered to have a moderate potential to occur within the wooded portion of the BSA.

4.4.14.7. LONG-EARED MYOTIS

The long-eared myotis (*Myotis evotis*) is included on CDFW's California State Special Animals List (CDFW 2024a). It can be found throughout California except in the Central Valley and southern deserts. They may occur in all brush, woodland, and forest habitats, though coniferous woodlands and forests seem to be preferred. Roosts are made in buildings, crevices, under tree bark, and in snags. This species roosts singly or in small groups, with nursery colonies ranging from 12-30 individuals. Long-eared myotis prey on a variety of insects and other small arthropods, which are captured in the air, gleaned from foliage, or occasionally taken from the ground (CDFW 2008).

There are no recorded occurrences of long-eared myotis in the CNDDB within five miles of the BSA (CDFW 2024b).

There is no day roosting habitat in the Sir Francis Drake Blvd Bridge, because the concrete is completely sealed and there are no cracks or crevasses suitable for use by bats. However, long-eared myotis may roost in tree crevices or cavities throughout the BSA and forage in the surrounding riparian corridor. There is suitable night roost habitat on the underside of the bridge, though it is marginal in quality because there are few recessed spaces that could trap heat and protect roosting bats from exposure.

Based on the presence of suitable foraging habitat and marginally suitable night roosting habitat, long-eared myotis is considered to have a moderate potential to occur within the BSA.

4.4.14.8. FRINGED MYOTIS

The fringed myotis (*Myotis thysanodes*) is included on CDFW's Special Animals List (CDFW 2024a). They range throughout California except for the Central Valley and southern deserts. They may occur in a wide variety of habitats, although pinyon-juniper, valley foothill hardwood, and hardwood-conifer habitats are preferred. Caves, mines, buildings, and crevices are all used for roosting, and maternity colonies can contain up to 200 individuals. Fringed myotis feed mostly on beetles, but other insects and arthropods are also taken. They feed over water, over open areas, and by gleaning from foliage (CDFW 2008).

There are no recorded occurrences of fringed myotis in the CNDDB within five miles of the BSA (CDFW 2024b).

There is no day roosting habitat in the Sir Francis Drake Blvd Bridge, because the concrete is completely sealed and there are no cracks or crevasses suitable for use by bats. However, fringed myotis may roost in tree crevices or cavities throughout the BSA and forage in the surrounding riparian corridor. There is suitable night roost habitat on the underside of the bridge, though it is marginal in quality because there are few recessed spaces that could trap heat and protect roosting bats from exposure.

Based on the presence of suitable foraging habitat and marginally suitable night roosting habitat, fringed myotis is considered to have a moderate potential to occur within the BSA.

4.4.14.9. LONG-LEGGED MYOTIS

The long-legged myotis (*Myotis volans*) is included on CDFW's Special Animals List (CDFW 2024a). They range throughout California except for the Central Valley and southern deserts, occurring in a variety of woodland and scrub habitats. They may roost in crevices, buildings, caves, tree hollows, and underneath loose tree bark. Females gather in maternity colonies of up to hundreds of individuals. Most maternity colonies are found in trees, thought they are occasionally found in buildings. They feed primarily on moths (CDFW 2008).

There are no recorded occurrences of long-legged myotis in the CNDDB within five miles of the BSA (CDFW 2024b).

There is no day roosting habitat in the Sir Francis Drake Blvd Bridge, because the concrete is completely sealed and there are no cracks or crevasses suitable for use by

bats. However, long-legged myotis may roost in tree crevices or cavities throughout the BSA and forage in the surrounding riparian corridor. There is suitable night roost habitat on the underside of the bridge, though it is marginal in quality because there are few recessed spaces that could trap heat and protect roosting bats from exposure.

Based on the presence of suitable foraging habitat and marginally suitable night roosting habitat, long-legged myotis is considered to have a moderate potential to occur within the BSA.

4.4.14.10. YUMA MYOTIS

The Yuma myotis (*Myotis yumanensis*) is included on CDFW's Special Animals List (CDFW 2024a). It is a common species occurring throughout California. 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 2008).

There are no recorded occurrences of Yuma myotis in the CNDDB within five miles of the BSA (CDFW 2024b).

There is no day roosting habitat in the Sir Francis Drake Blvd Bridge, because the concrete is completely sealed and there are no cracks or crevasses suitable for use by bats. However, Yuma myotis may roost in tree crevices or cavities throughout the BSA and forage in the surrounding riparian corridor. There is suitable night roost habitat on the underside of the bridge, though it is marginal in quality because there are few recessed spaces that could trap heat and protect roosting bats from exposure. Yuma myotis is a very common species in this part of California, and as such they are more likely to occur than other *Myotis* species.

Based on the presence of suitable roosting and foraging habitat and the species' ubiquity in the region, Yuma myotis is considered to have a high potential to occur within the BSA.

4.4.14.11. 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 #12), biological monitoring (Measure #14), worker environmental awareness training (Measure #15), and construction activities around roosting bats (Measure #25).

4.4.14.12. PROJECT IMPACTS

There are no confirmed bat roosting sites present within the BSA. The current bridge structure is not suitable for bat roosting. Preconstruction surveys for bat roosts in trees will reduce impacts to bats.

4.4.14.13. 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.

4.4.14.14. CUMULATIVE IMPACTS

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

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

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 Sir Francis Drake Boulevard Valley 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 Biological Assessments (BA). A Biological Opinion (BO) will be obtained from the USFWS and NMFS. The County has determined that the Project *may affect, and is likely to adversely affect* California red-legged frog, coho salmon – CCC ESU, steelhead – CCC DPS, and tidewater goby. The County has determined that the Project *may affect, and is likely to adversely affect* critical habitat for coho salmon – CCC ESU, and steelhead – CCC DPS. The County has also determined that the Project *may affect, but is not likely to adversely affect* California freshwater shrimp, Northwestern pond turtle, and green sturgeon and critical habitat for California red-legged frog, and tidewater goby. No effects to any other federally listed or candidate species are anticipated.

5.2. Essential Fish Habitat Consultation Summary

Olema Creek is within the USGS Hydrologic Unit #180500050104, which is generally mapped as EFH for freshwater salmon. Lagunitas Creek is mapped as EFH for groundfish, and it overlaps a small portion of the Project. The Project will remove existing piers from Olema Creek, which will be beneficial and result in a wider opening under the bridge for the channel. Temporary impacts to Lagunitas Creek and Olema Creek will be restored. RSP will be placed in Olema Creek to stabilize the banks at the new abutments. This is a permanent impact to the creek. However, this does not diminish the ability for fish to move through this portion of the creek. Additionally, no impacts to spawning habitat will occur, as fish spawning habitat is not present at the site. As a result, the Project will have *no adverse effects* to EFH for freshwater salmon or groundfish. However, consultation for EFH with NMFS may still be required.

5.3. California Endangered Species Act Consultation Summary

CESA generally parallels the main provisions of the FESA but extends the take prohibitions to species proposed for listing. Sections 2080 and 2081 of California 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. Consultation with CDFW will likely be required for anticipated impacts to California freshwater shrimp and coho salmon.

The AMMs included in Section 1.3 will reduce the potential for adverse effects to state listed species.

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.

Only one species that is fully protected, the California black rail, may potentially be affected by the Project. The AMMs included in Section 1.3 will eliminate the potential for adverse effects to this species; 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 County's coordination with 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 Olema 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. The County 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. The County 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 to the maximum extent practicable.

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 coast live oak, California bay, arroyo willow, coast redwood, California buckeye, Oregon ash, red alder, and white 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 the County

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 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.

Chapter 6. References

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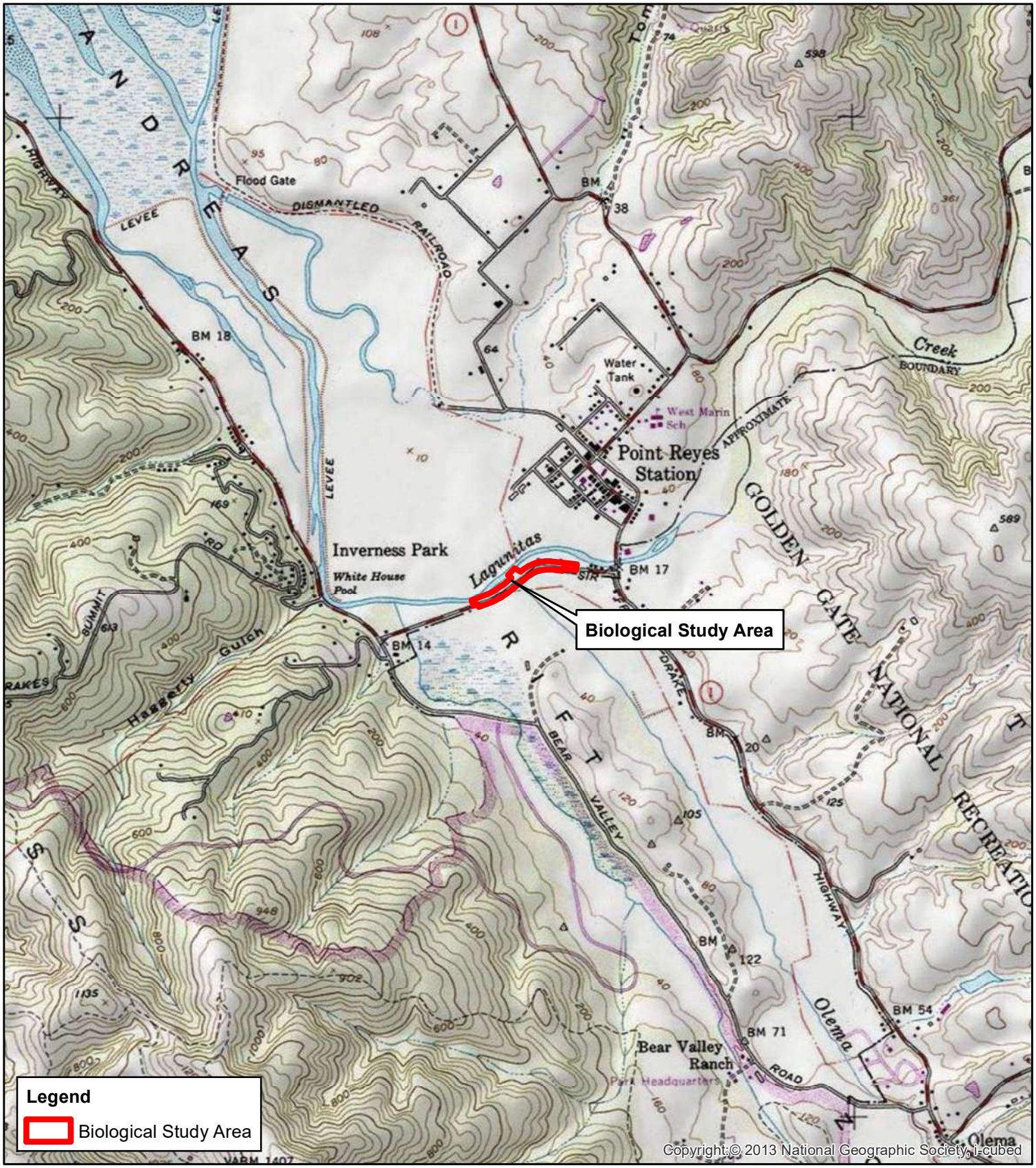
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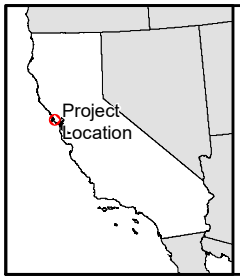
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Appendix A Project Figures





USGS 7.5' Quad:
Inverness (1976)

Legal Description:
T3N, R9W Sections 35, 36

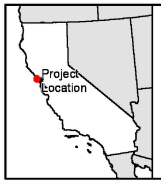
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Scale 1:24,000
1 Inch = 2,000 Feet

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

Figure 1: Project Location
Sir Francis Drake Blvd
Bridge Replacement Over
Olema Creek
Marin County, CA





N

Scale 1:1,200
1 Inch = 100 Feet

0 15 30 Meters
0 50 100 Feet

Figure 2:
Biological Study Area
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA

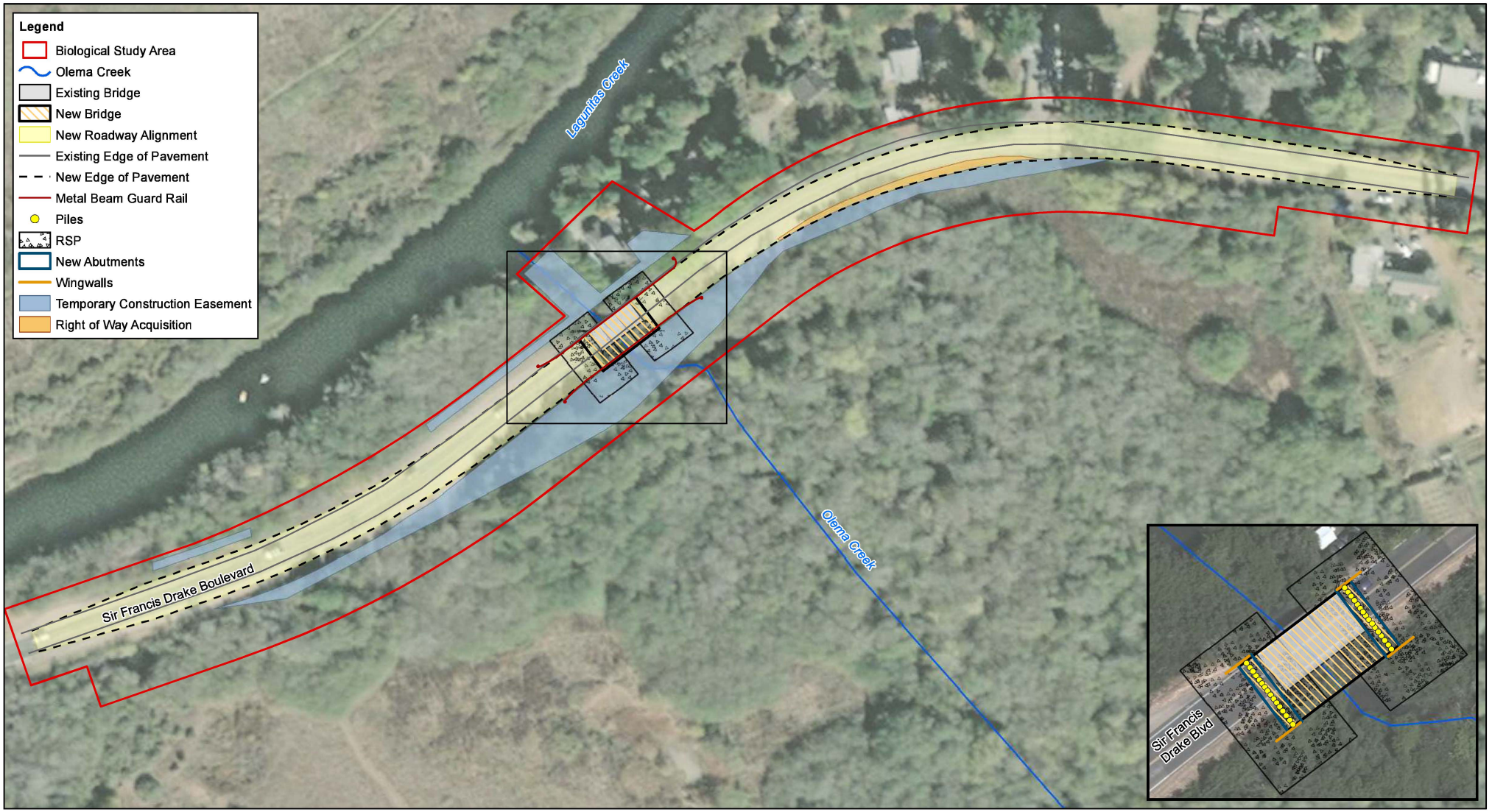
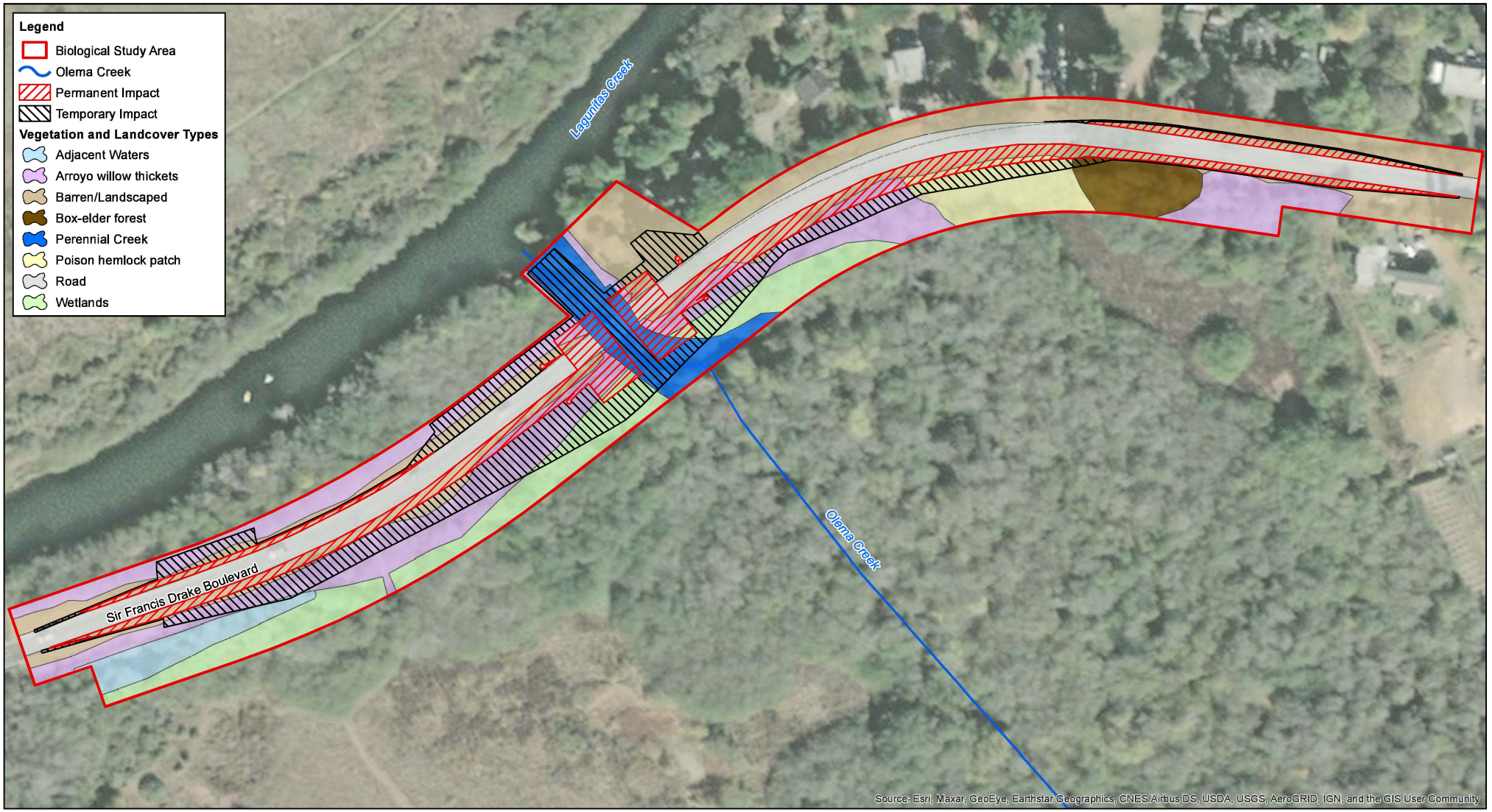


Figure 3: Project Elements
Sir Francis Drake Blvd. Bridge Replacement Over Olema Creek
Marin County, CA





N

Scale 1:1,200
1 Inch = 100 Feet

0 15 30 Meters

0 50 100 Feet

Figure 4. Project Impacts
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA





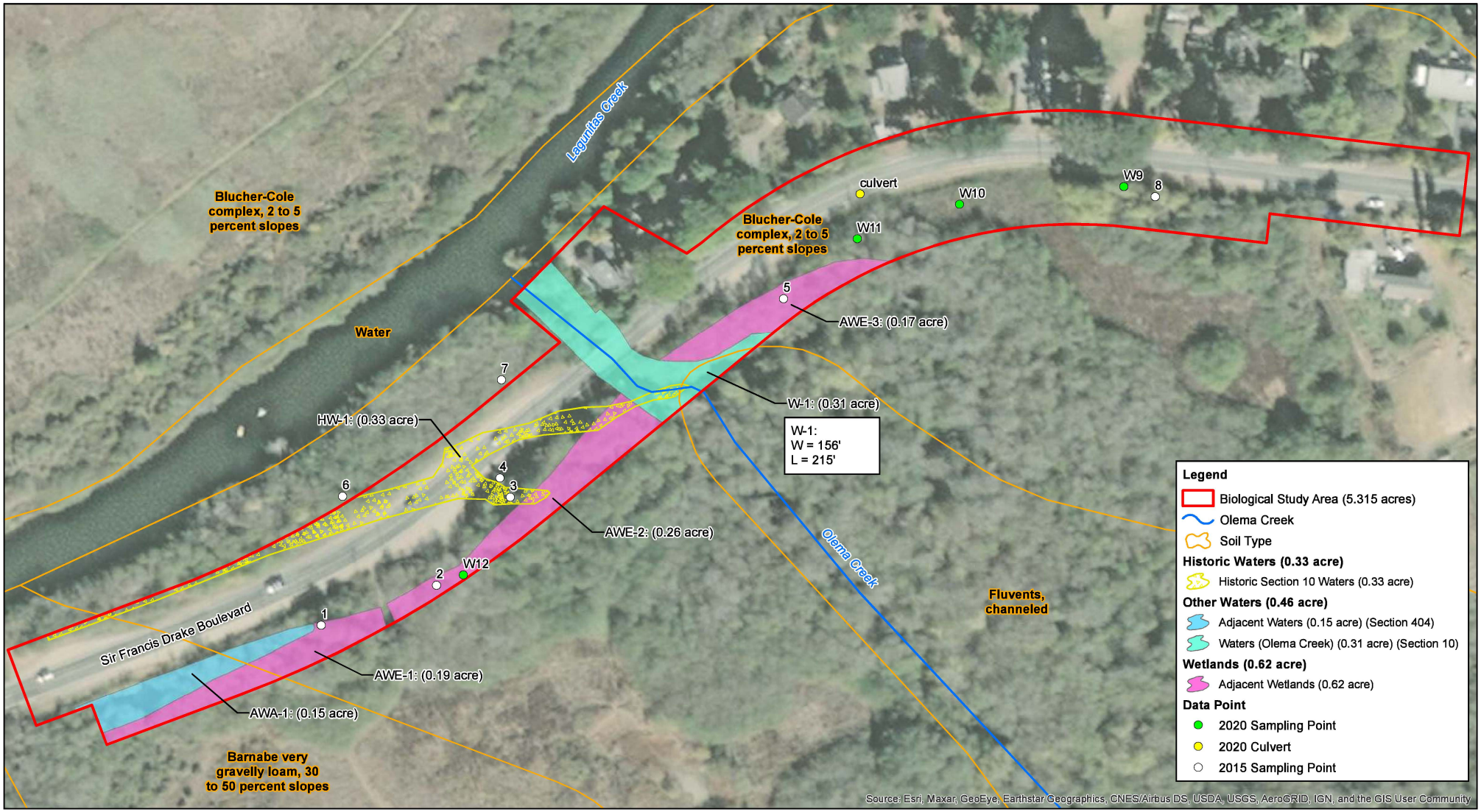
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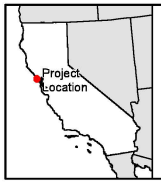
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1 Inch = 100 Feet

0 15 30 Meters

0 50 100 Feet

Figure 5: Noise Impacts
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA





USGS 7.5' Quad:
Inverness (1976)

Legal Description:
T3N, R9W Sections 35, 36

Delineation by Constance Ganong and Rebecca Doubledee
on July 22, August 20 and September 9, 2015
and Constance Ganong on November 6, 2020.
Date of Map: 11/24/20

N
Scale 1:1,200
1 Inch = 100 Feet

0 10 20 Meters
0 50 100 Feet

Figure 6:
Potential Jurisdictional Section 404 Wetlands and Waters and Section 10 Waters
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA





N

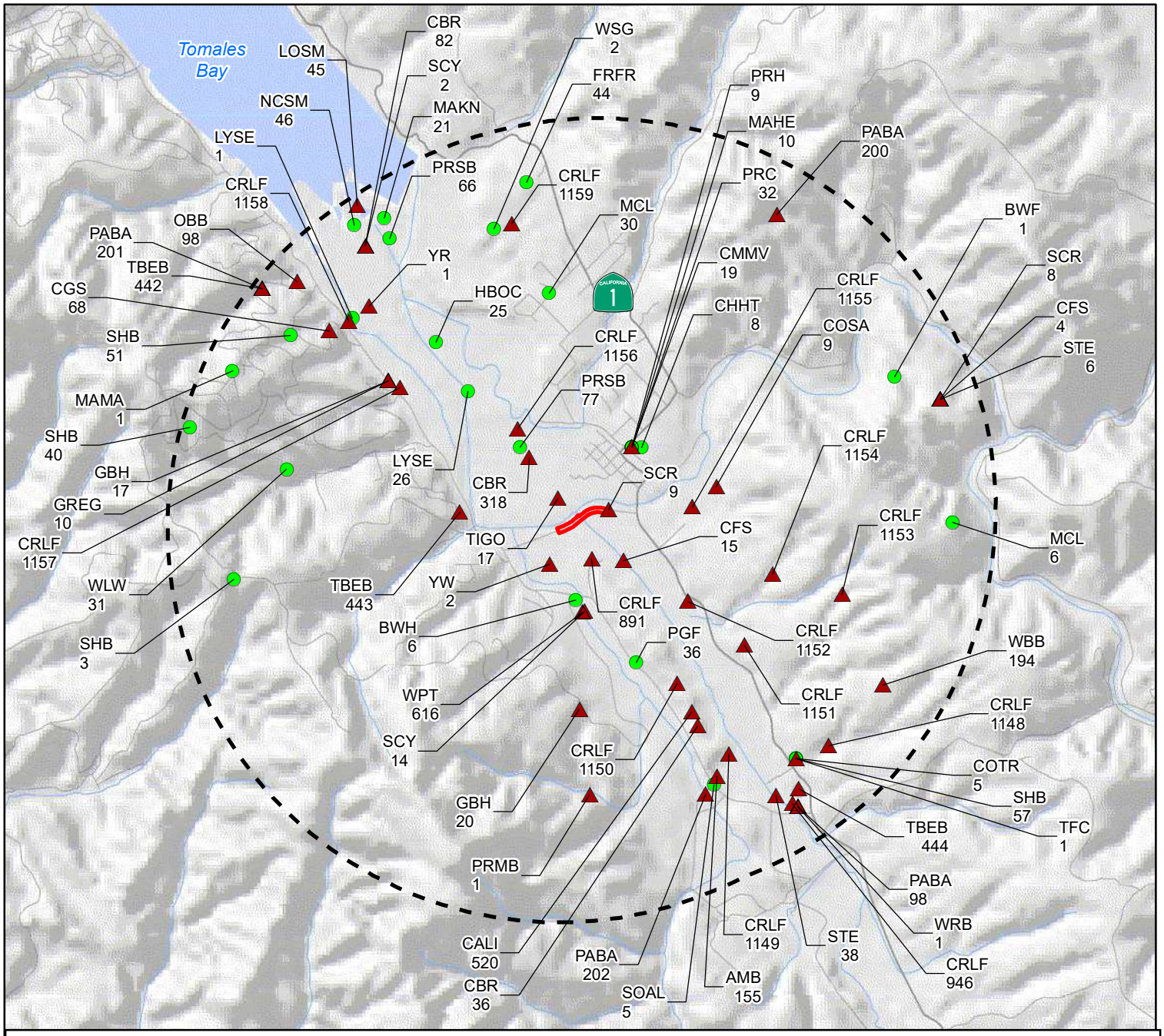
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1 Inch = 100 Feet

0 15 30 Meters

0 50 100 Feet

Figure 7: Shade Impacts
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA

KLEINFELDER
GANDA



AMB: American badger
BWF: bluff wallflower
BWH: Bolander's water-hemlock
CALI: California linderiella
CBR: California black rail
CFS: California freshwater shrimp
CGS: California giant salamander
CHHT: congested-headed hayfield tarplant
CMMV: coastal marsh milk-vetch
COSA: coho salmon
COTR: coastal triquetrella
CRLF: California red-legged frog
FRFR: fragrant fritillary
GBH: great blue heron
GREG: great egret
HBOC: Humboldt Bay owl's-clover
LOSM: longfin smelt
LYSE: Lyngbye's sedge
MAHE: Marin hesperian
MAKN: Marin knotweed
MAMA: Marin manzanita
MCL: Marin checker lily
NCSM: Northern Coastal Salt Marsh
OBB: obscure bumble bee
PABA: pallid bat
PGF: perennial goldfields
PRC: Point Reyes checkerbloom
PRH: Point Reyes horkelia
PRMB: Point Reyes mountain beaver
PRSB: Point Reyes salty bird's-beak
SCR: southern coastal roach
SCY: saltmarsh common yellowthroat
SHB: silver-haired bat
SHB: swamp harebell
SOAL: Sonoma alopecurus
STE: steelhead
TBEB: Townsend's big-eared bat
TFC: two-fork clover
TIGO: tidewater goby
WBB: western bumble bee
WLW: western leatherwood
WPT: western pond turtle
WRB: western red bat
WSG: water star-grass
YR: yellow rail
YW: yellow warbler



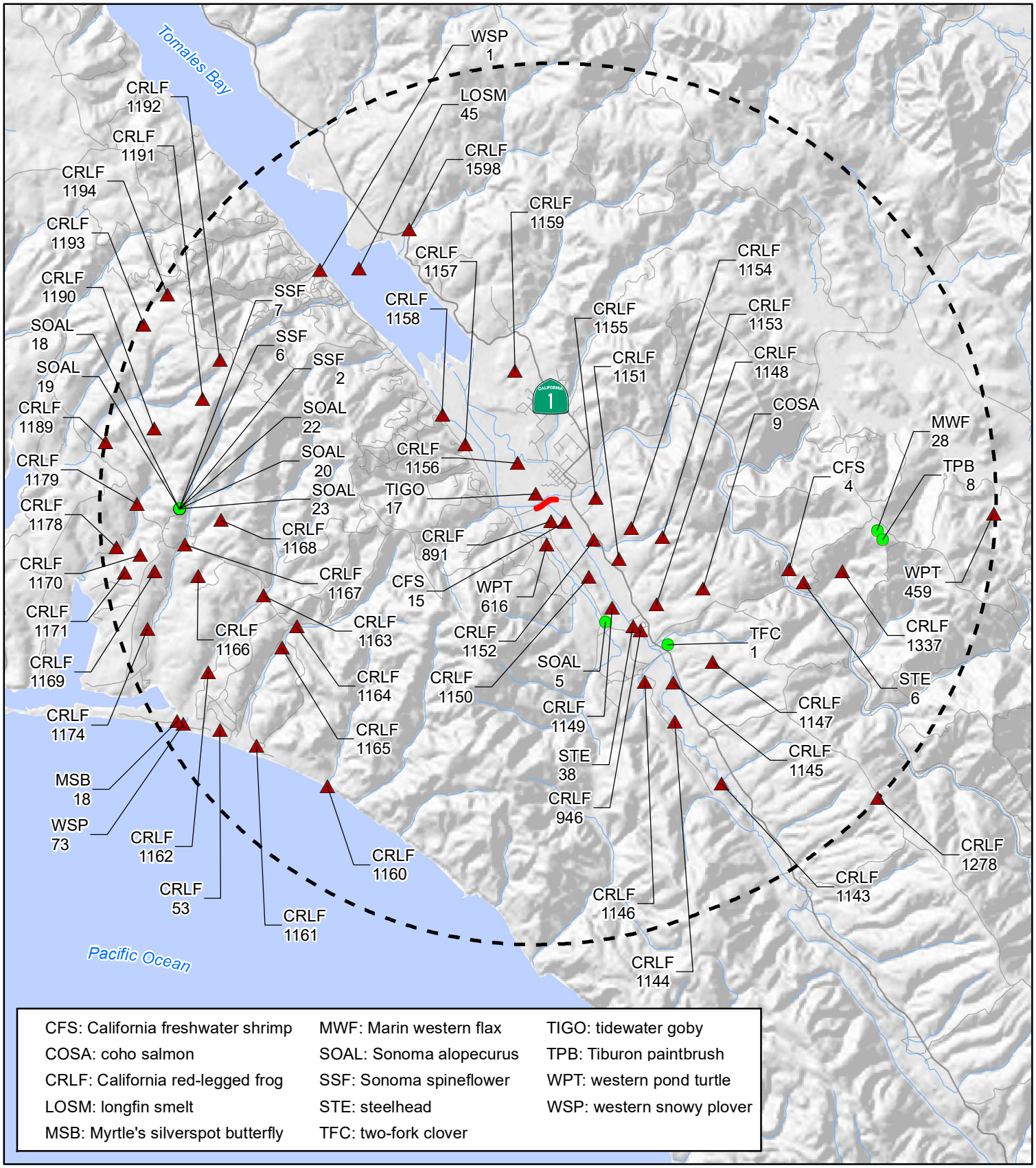
2 Mile Buffer
Biological Study Area
CNDDB Plant Occurrence
CNDDB Wildlife Occurrence

N

Scale 1:48,000
1 Inch = 4,000 Feet

0 600 1,200 Meters
0 2,000 4,000 Feet

Figure 8: CNDDB Occurrences within 2 Miles of the Biological Study Area
Sir Francis Drake Blvd
Bridge Replacement Over
Olema Creek
Marin County, CA





5-Mile Buffer
Biological Study Area
CNDDB Plant Occurrence
CNDDB Wildlife Occurrence

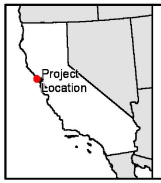
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Scale 1:84,000
1 Inch = 7,000 Feet

0 1,200 2,400 Meters
0 4,000 8,000 Feet

Figure 9: CNDDB Federally Listed Species within 5 Miles of the Biological Study Area
Sir Francis Drake Blvd
Bridge Replacement Over
Olema Creek
Marin County, CA





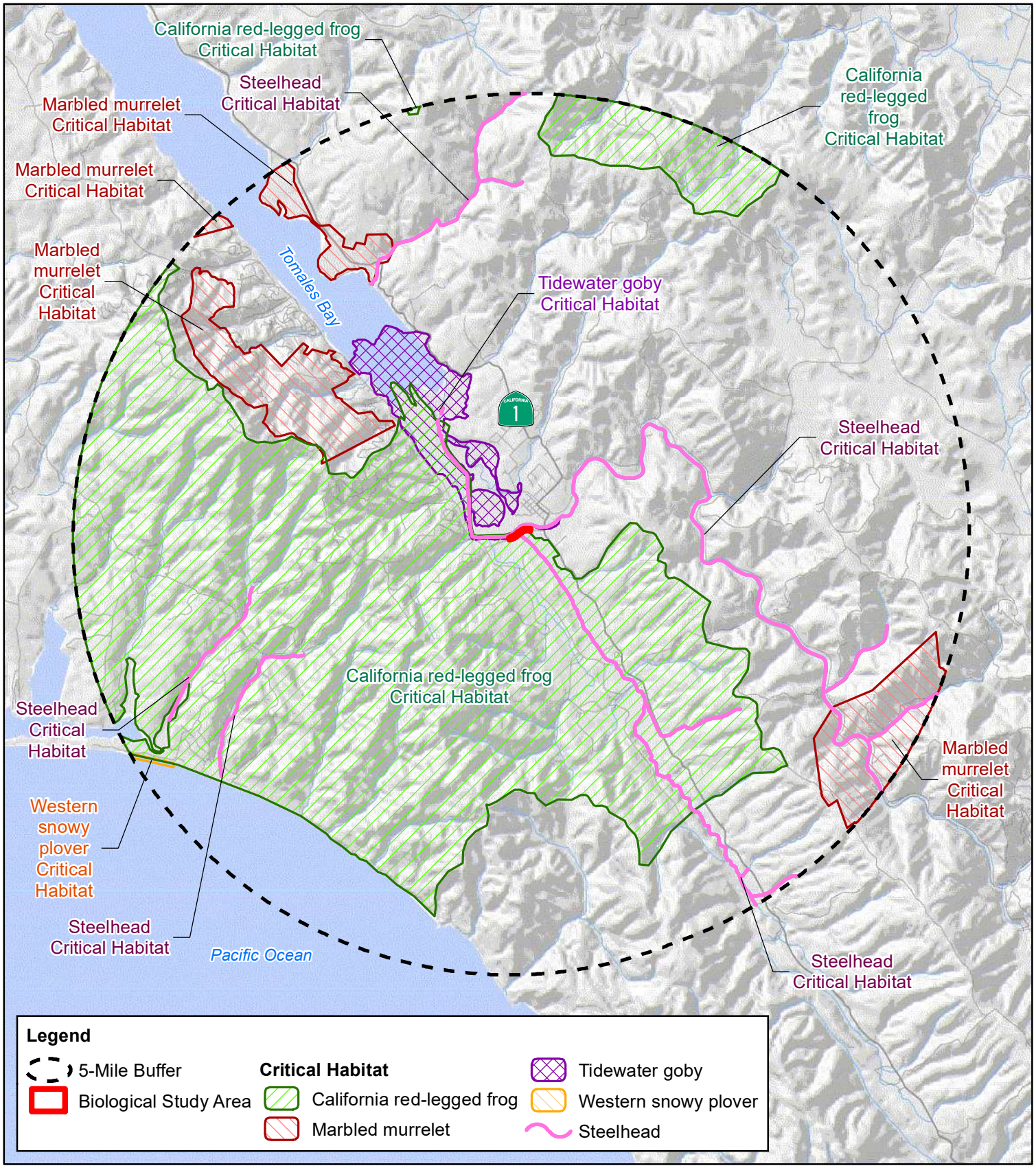
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Scale 1:1,200
1 Inch = 100 Feet

0 15 30 Meters

0 50 100 Feet

Figure 10:
Tree Survey Results
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA



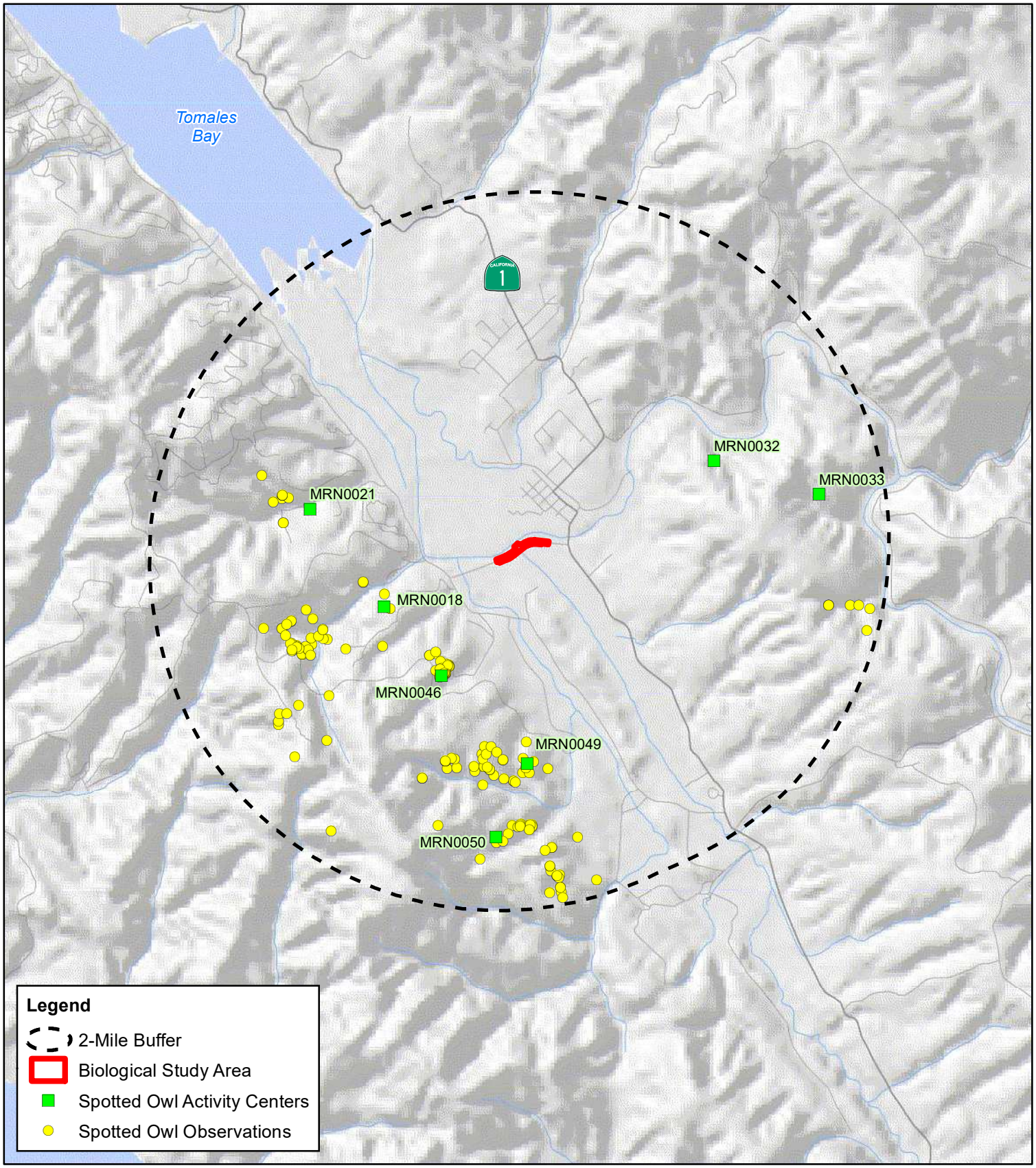


0 1,200 2,400 Meters
0 4,000 8,000 Feet

N

Scale 1:96,000
1 Inch = 8,000 Feet

Figure 11: Critical Habitat within 5 Miles of the Biological Study Area
Sir Francis Drake Blvd
Bridge Replacement Over
Olema Creek
Marin County, CA





0 600 1,200 Meters

0 2,000 4,000 Feet

N

Scale 1:48,000
1 Inch = 4,000 Feet

Figure 12: Spotted Owl Records within 2 Miles of the Biological Study Area
Sir Francis Drake Blvd
Bridge Replacement Over
Olema 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: 10/03/2024 17:08:02 UTC
Project Code: 2024-0055807
Project Name: Sir Francis Drake Blvd Bridge Replacement

Subject: List of threatened and endangered species that may occur in your proposed project location 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, 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 U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

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 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 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:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

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 Code 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

Project Code: 2024-0055807

Project Name: Sir Francis Drake Blvd Bridge Replacement

Project Type: Bridge - Replacement

Project Description: The County of Marin proposes the Sir Francis Drake Boulevard Bridge Replacement Project (Project) to replace the existing bridge over Olema Creek.

The bridge replacement will include replacing the existing bridge structure with a new single-span, cast-in-place, post-tensioned concrete slab bridge, shifting the bridge alignment to the east, constructing new bridge abutments, realigning and repaving Sir Francis Drake Boulevard, and relocating overhead and underground utilities.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@38.06373105,-122.81073602780279,14z



Counties: Marin County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 13 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 *Sternula 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 does not overlap 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 does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

REPTILES

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened

AMPHIBIANS

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

FISHES

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate
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

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
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
Sonoma Alopecurus *Alopecurus aequalis var. sonomensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/557	Endangered

CRITICAL HABITATS

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
California Red-legged Frog *Rana draytonii* https://ecos.fws.gov/ecp/species/2891#crithab	Final
Tidewater Goby *Eucyclogobius newberryi* https://ecos.fws.gov/ecp/species/57#crithab	Final

IPAC USER CONTACT INFORMATION

Agency: Kleinfelder
Name: Emily Orenstein
Address: 1814 Franklin Street, Suite 504
City: Oakland
State: CA
Zip: 94612
Email eorenstein@kleinfelder.com
Phone: 5108910024

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

Appendix C NMFS Species List

From:	Emily Orenstein
To:	nmfs.wcrca.specieslist@noaa.gov
Cc:	Emily Orenstein
Subject:	Sir Francis Drake Boulevard Bridge Replacement
Date:	Thursday, October 3, 2024 11:16:36 AM

California Department of Transportation, District 4 (Local Assistance) – Sir Francis Drake Boulevard Bridge Replacement
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, #300, Oakland, CA 94612
Project title: Sir Francis Drake Boulevard Bridge Replacement [Local Assistance]
Point of Contact: Tom Holstein tom.holstein@dot.ca.gov, 510-286-6371
Keevan Harding, keevan.harding@dot.ca.gov, 510-622-5912

Date: 10/03/2024

Quad Name **Inverness**
Quad Number **38122-A7**

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) -	**X**

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 - X

ESA Marine Invertebrates

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

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat - X

ESA Sea Turtles

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

ESA Whales

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

ESA Pinnipeds

Guadalupe Fur Seal (T) - X

Essential Fish Habitat

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

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult Monica DeAngelis

monica.deangelis@noaa.gov

562-980-3232

MMPA Cetaceans - X
MMPA Pinnipeds - X

Emily Orenstein
Environmental Scientist

1814 Franklin Street, Suite 504
Oakland, CA 94612
d| 510.628.8144



This email may contain confidential information. If you have received this email—including any attachments—in error, please notify the sender promptly and delete the email and any attachments from all of your systems.

Appendix D 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:
FC: Federal candidate for listing
--: 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. 2020); CNPS *Online Inventory* (CNPS 2024); CalFlora (CalFlora 2019) and other sources.
[2] Habitat and elevation range information from CNDDB (CDFW 2024b) and CNPS *Online Inventory* (CNPS 2024).
[3] Information on known locations in the vicinity of the BSA was compiled from CNDDB (CDFW 2024b), CNPS *Online Inventory* (CNPS 2024), and USFWS (2024).
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.

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Plants					
Pink sand-verbena	*Abronia umbellata* var. *breviflora*	-/-/1B.1	Coastal dunes. Elevation 0 – 35 feet.	None. No coastal dune habitat in the BSA.	NA
Blasdale's bent grass	*Agrostis blasdalei*	-/-/1B.2	Coastal bluff scrub, coastal dunes, and coastal prairie. Elevation 0 – 495 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Franciscan onion	*Allium peninsulare* var. *franciscanum*	-/-/1B.2	Clay, volcanic, often serpentinite. Cismontane woodland and valley and foothill grassland. Elevation 170 – 1000 feet.	None. No suitable habitat in the BSA.	NA
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	FE/-/1B.1	Marshes and swamps (freshwater) and riparian scrub. Elevation 15 – 1,200 feet.	None. This perennial grass species was not observed during protocol-level rare plant surveys in May and July during its blooming time. Five of the known extant populations in Point Reyes National Seashore are clustered within a 4.6-square mile area around Abbots Lagoon (USFWS 2011).	**No Effect.** Based on protocol-level rare plant surveys, this perennial species was not observed in the BSA; therefore, the Project will have no effect to this species or its habitat.
Napa false indigo	*Amorpha californica* var. *napensis*	-/-/1B.2	Broadleafed upland forest (openings), chaparral, and cismontane woodland. Elevation 390 – 6,560 feet.	None. No suitable habitat in the BSA.	NA
Bent-flowered fiddleneck	*Amsinckia lunaris*	-/-/1B.2	Coastal bluff scrub, cismontane woodland, and valley and foothill grassland. Elevation 5 – 1,640 feet.	None. No suitable habitat in the BSA.	NA
Vine Hill manzanita	*Arctostaphylos densiflora*	-/SE/1B.1	Chaparral (acid marine sand). Elevation 165 – 395 feet.	None. No suitable habitat in the BSA.	NA
Mt. Tamalpais manzanita	*Arctostaphylos montana* ssp. *montana*	-/-/1B.3	Serpentinite, rocky. Chaparral and valley and foothill grassland. Elevation 520 – 2,495 feet.	None. No serpentine habitat in the BSA.	NA
Marin Manzanita	*Arctostaphylos virgata*	-/-/1B.2	Sandstone or granitic. Broadleafed upland forest, closed-cone coniferous forest, chaparral, and North Coast coniferous forest. Elevation 195 – 2,295 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	-/-/1B.2	Coastal dunes (mesic), coastal scrub, and marshes and swamps (coastal salt, streamsides). Elevation 0 – 100 feet.	None. No suitable habitat in the BSA.	NA
Alkali milk-vetch	*Astragalus tener* var. *tener*	-/-/1B.2	Alkaline. Playas, valley and foothill grassland (adobe clay), and vernal pools. Elevation 0 – 195 feet.	None. No alkaline habitat in the BSA.	NA
Point Reyes blennosperma	*Blennosperma nanum* var. *robustum*	-/SR/1B.2	Coastal prairie, Coastal scrub. Elevation 35 – 475 feet	None. No suitable habitat in the BSA.	NA
Thurber's reed grass	*Calamagrostis crassiglumis*	-/-/2B.1	Coastal scrub (mesic) and marshes and swamps (freshwater). Elevation 30 – 195 feet.	None. This perennial grass species was not observed during protocol-level rare plant surveys in May and July during its blooming period. Nearest current CNDDB occurrence record is over 6 miles west of the BSA in Point Reyes National Seashore.	NA
Coastal bluff morning-glory	*Calystegia purpurata* ssp. *saxicola*	-/-/1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub, North Coast coniferous forest. Elevation 0 – 345 feet.	None. No suitable habitat in the BSA.	NA
Swamp harebell	*Campanula californica*	-/-/1B.2	Mesic. Bogs and fens, closed-cone coniferous forest, coastal prairie, meadows and seeps, marshes and swamps (freshwater), and North Coast coniferous forest. Elevation 0 – 1,330 feet.	None. This perennial dicot species was not observed during protocol-level rare plant surveys in July during its blooming time. Nearest current CNDDB occurrence record is less than 2 miles northwest of the BSA in Point Reyes National Seashore.	NA
Seaside bittercress	*Cardamine angulata*	-/-/2B.2	Wet areas, streambanks. Lower montane coniferous forest and North Coast coniferous forest. Elevation 80 – 3,000 feet.	None. No suitable habitat in the BSA.	NA
Bristle-stalked sedge	*Carex leptalea*	-/-/2B.2	Bogs and fens, Marshes and swamps, Meadows and seeps (mesic). Elevation 0 – 2,295 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Lyngbye's sedge	*Carex lyngbyei*	-/-/2B.2	Marshes and swamps (brackish or freshwater). Elevation 0 – 35 feet.	None. This perennial sedge species was not observed during protocol-level rare plant surveys in May and July during its blooming period. Nearest current CNDDB occurrence record is over 0.8 mile north of the BSA in Point Reyes National Seashore.	NA
Tiburon paintbrush	*Castilleja affinis* ssp. *neglecta*	FE/ST/1B.2	Valley and foothill grassland (serpentinite). Elevation 195 – 1,310 feet.	None. No serpentine grassland habitat in the BSA.	**No Effect.** Based on site visits, there is no suitable habitat in the BSA; therefore, the Project will have no effect to this species or its habitat.
Humboldt Bay owl's-clover	*Castilleja ambigua* var. *humboldtiensis*	-/-/1B.2	Marshes and swamps (coastal salt). Elevation 0 – 10 feet.	None. No coastal salt marsh habitat in the BSA.	NA
Point Reyes paintbrush	*Castilleja leschkeana*	-/-/1A	Marshes and swamps (coastal). Elevation 0 – 35 feet.	None. No suitable habitat in the BSA.	NA
Nicasio ceanothus	*Ceanothus decornutus*	-/-/1B.2	Chaparral (maritime). serpentinite, rocky, sometimes clay. Elevation 770-950 feet.	None. No serpentine habitat in the BSA.	NA
Mt. Vision ceanothus	*Ceanothus gloriosus* var. *porrectus*	-/-/1B.3	Closed-cone coniferous forest, coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 80 – 1,000 feet.	None. No suitable habitat in the BSA.	NA
Mason's ceanothus	*Ceanothus masonii*	-/SR/1B.2	Chaparral (openings, rocky, serpentinite). Elevation 750 – 1,640 feet.	None. No serpentine chaparral habitat in the BSA.	NA
Point Reyes bird's-beak	*Chloropyron maritimum* ssp. *palustre*	-/-/1B.2	Marshes and swamps (coastal salt). Elevation 0 – 35 feet.	None. No coastal salt marsh habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Soft bird's-beak	*Chloropyron molle* ssp. *molle*	FE/SR/1B.2	Marshes and swamps (coastal salt). Elevation 0-10 feet.	None. No coastal salt marsh habitat in the BSA.	NA
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	-/-/1B.2	Sandy. Coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub. Elevation 5 – 705 feet.	None. No suitable habitat in the BSA.	NA
Woolly-headed spineflower	*Chorizanthe cuspidata* var. *villosa*	-/-/1B.2	Coastal dunes, Coastal prairie, Coastal scrub (sandy). Elevation 10 – 195 feet.	None. No suitable habitat in the BSA.	NA
Sonoma spineflower	*Chorizanthe valida*	FE/SE/1B.1	Coastal prairie (sandy). Elevation 30 – 1,000 feet.	None. No suitable habitat in the BSA.	NA
Bolander's water-hemlock	*Cicuta maculata* var. *bolanderi*	-/-/2B.1	Marshes and swamps and coastal, fresh or brackish water. Elevation 10 – 660 feet.	None. This perennial dicot species was not observed during protocol-level rare plant surveys in July during its blooming time. Nearest current CNDDB occurrence record is approximately 5 miles north of the BSA in Point Reyes National Seashore.	NA
Franciscan thistle	*Cirsium andrewsii*	-/-/1B.2	Mesic, sometimes serpentinite. Broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. Elevation 0 – 500 feet.	None. No suitable habitat in the BSA.	NA
Mt. Tamalpais thistle	*Cirsium hydrophilum* var. *vaseyi*	-/-/1B.2	Serpentinite seeps. Broadleafed upland forest, chaparral, and meadows and seeps. Elevation 785–2,035 feet.	None. No serpentine seep habitat in the BSA.	NA
Raiche's red ribbons	*Clarkia concinna* ssp. *raichei*	-/-/1B.1	Coastal bluff scrub. Elevation 0 – 330 feet.	None. No suitable habitat in the BSA.	NA
Round-headed Chinese-houses (round-headed collinsia)	*Collinsia corymbosa*	-/-/1B.2	Coastal dunes. Elevation 0 – 65 feet.	None. No coastal dune habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Baker's larkspur	*Delphinium bakeri*	FE/SE/1B.1	Decomposed shale, often mesic. Broadleafed upland forest, coastal scrub, and valley and foothill grassland. Elevation 260 – 1,010 feet.	None. No suitable habitat in the BSA.	NA
Golden larkspur	*Delphinium luteum*	FE/SR/1B.1	Rocky. Chaparral, coastal prairie, and coastal scrub. Elevation 0 – 330 feet	None. No suitable habitat in the BSA.	**No Effect.** Based on site visits, there is no suitable habitat in the BSA; therefore, the Project will have no effect to this species or its habitat.
Western leatherwood	*Dirca occidentalis*	-/-/1B.2	Mesic. Broadleafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland. Elevation 80 – 1,395 feet.	None. No suitable habitat in the BSA.	NA
Koch's cord moss	*Entosthodon kochii*	-/-/1B.3	Cismontane woodland (soil). Elevation 594 -3,300 feet.	None. No cismontane woodland habitat in the BSA.	NA
Supple daisy	*Erigeron supplex*	-/-/1B.2	Coastal bluff scrub, Coastal prairie. Elevation 35 – 165 feet.	None. No suitable habitat in the BSA.	NA
Tiburon buckwheat	*Eriogonum luteolum* var. *caninum*	-/-/1B.2	Serpentinite, sandy to gravelly. Chaparral, cismontane woodland, coastal prairie, and valley and foothill grassland. Elevation 0 – 2,297 feet.	None. No serpentine habitat in the BSA.	NA
Bluff wallflower	*Erysimum concinnum*	-/-/1B.2	Coastal bluff scrub, coastal dunes, and coastal prairie. Elevation 0 – 610 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Minute pocket moss	*Fissidens pauperculus*	-/-/1B.2	North Coast coniferous forest (damp coastal soil). Elevation 30-3360 feet.	None. No suitable habitat in the BSA.	NA
Marin checker lily	*Fritillaria lanceolata* var. *tristulis*	-/-/1B.1	Coastal bluff scrub, coastal prairie, and coastal scrub. Elevation 50 – 495 feet.	None. No suitable habitat in the BSA.	NA
Fragrant fritillary	*Fritillaria liliacea*	-/-/1B.2	Often serpentinite. Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 10 – 1,345 feet.	None. No suitable habitat in the BSA.	NA
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	-/-/1B.1	Coastal dunes and coastal scrub. Elevation 10 – 660 feet.	None. No suitable habitat in the BSA.	NA
Woolly-headed gilia	*Gilia capitata* ssp. *tomentosa*	-/-/1B.1	Serpentinite, rocky, outcrops. Coastal bluff scrub and valley and foothill grassland. Elevation 30 -720 feet.	None. No serpentine habitat in the BSA.	NA
Dark-eyed gilia	*Gilia millefoliata*	-/-/1B.2	Coastal dunes. Elevation 10 – 100 feet.	None. No dune habitat in the BSA.	NA
Diablo helianthella	*Helianthella castanea*	-/-/1B.2	Broadleafed upland forest, Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland, Valley and foothill grassland. Usually rocky, axonal soils. Often in partial shade. Elevation 195-4265 feet.	None. No suitable habitat in the BSA and outside elevation range.	NA
White seaside tarplant (congested-headed hayfield tarplant)	*Hemizonia congesta* ssp. *congesta*	-/-/1B.2	Sometimes roadsides. Valley and foothill grassland. Elevation 65 – 1,835 feet.	None. No grassland habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Short-leaved evax	*Hesperevax sparsiflora var. brevifolia*	-/-/1B.2	Coastal bluff scrub (sandy), coastal dunes, and coastal prairie. Elevation 0 – 710 feet.	None. No suitable habitat in the BSA.	NA
Marin dwarf flax (Marin western flax)	*Hesperolinon congestum*	FT/ST/1B.1	Serpentinite. Chaparral and valley and foothill grassland. Elevation 16 – 1,214 feet.	None. No serpentine habitat in the BSA.	**No Effect.** No suitable habitat in the BSA.
Water star-grass	*Heteranthera dubia*	-/-/2B.2	Requires a pH of 7 or higher, usually in slightly eutrophic waters. Marshes and swamps (alkaline, still or slow-moving water). Elevation 95 – 4,905 feet.	None. No alkaline marsh or pond habitat in the BSA.	NA
Santa Cruz tarplant	*Holocarpha macradenia*	FT/SE/1B.1	Often clay, sandy. Coastal terrace prairie and grassland. Elevation 30 - 720 feet.	None. No suitable habitat in the BSA. Natural populations are restricted to coastal terrace prairie habitat within Santa Cruz and Monterey Counties.	**No Effect.** Based on site visits, there is no suitable habitat and the area is outside the species known range; therefore, the Project will have no effect to this species or its habitat.
Kellogg's horkelia	*Horkelia cuneata* var. *sericea*	-/-/1B.1	Chaparral (maritime), Closed-cone coniferous forest, Coastal dunes, Coastal scrub. Elevation 35 – 655 feet.	None. No suitable habitat in the BSA.	NA
Point Reyes horkelia	*Horkelia marinensis*	-/-/1B.2	Sandy. Coastal dunes, Coastal prairie, Coastal scrub. Elevation 20 - 2,490 feet.	None. No suitable habitat in the BSA.	NA
Thin-lobed horkelia	*Horkelia tenuiloba*	-/-/1B.2	Mesic openings, sandy. Broadleafed upland forest, chaparral, and valley and foothill grassland. Elevation 165 –1,650 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Island rock lichen (island tube lichen)	*Hypogymnia schizidiata*	-/-/1B.3	Closed-cone coniferous forest, Chaparral. On bark and wood of hardwoods and conifers. Elevation 1,180 – 1,330 feet.	None. No suitable habitat in the BSA and outside elevation range.	NA
Small groundcone	*Kopsiopsis hookeri*	-/-/2B.3	North Coast coniferous forest. Elevation 300 – 2,910 feet.	None. No coniferous forest habitat in the BSA.	NA
Baker's goldfields	*Lasthenia californica* ssp. *bakeri*	-/-/1B.2	Closed-cone coniferous forest (openings), Coastal scrub, Marshes and swamps, Meadows and seeps. Elevation 195 – 1,705 feet.	None. No suitable habitat in the BSA and outside elevation range.	NA
Perennial goldfields	*Lasthenia californica* ssp. *macrantha*	-/-/1B.2	Coastal bluff scrub, coastal dunes, and coastal scrub. Elevation 15 - 1,715 feet.	None. No suitable habitat in the BSA.	NA
Contra Costa goldfields	*Lasthenia conjugens*	FE/--/1B.1	Cismontane woodland, Playas (alkaline), Valley and foothill grassland, Vernal pools. Elevation 0-1,540 feet.	None. No suitable habitat in the BSA.	**No Effect.** No suitable habitat in the BSA.
Beach layia	*Layia carnosa*	FE/SE/1B.1	Coastal dunes and coastal scrub (sandy). Elevation 0 – 200 feet.	None. No suitable habitat in the BSA.	**No Effect.** No suitable habitat in the BSA.
Coast yellow leptosiphon	*Leptosiphon croceus*	-/SE/1B.1	Coastal bluff scrub and coastal prairie. Elevation 30 – 490 feet.	None. No suitable habitat in the BSA.	NA
Rose leptosiphon	*Leptosiphon rosaceus*	-/-/1B.1	Coastal bluff scrub. Elevation 0 – 330 feet.	None. No suitable habitat in the BSA.	NA
Tamalpais lessingia	*Lessingia micradenia* var. *micradenia*	-/-/1B.2	Usually serpentinite, often roadsides. Chaparral and valley and foothill grassland. Elevation 330 – 1,650 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Mason's lilaeopsis	*Lilaeopsis masonii*	-/SR/1B.1	Marshes and swamps (brackish or freshwater) and riparian scrub. Elevation 0 - 35 feet.	None. This perennial dicot was not observed during protocol-level rare plant surveys in May and July during its blooming time. CNDDB occurrence in Point Reyes NS is historic (1936). Nearest current CNDDB occurrence records are over 30 miles east of the BSA around Suisun Bay.	NA
Coast lily	*Lilium maritimum*	-/-/1B.1	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.	None. This perennial monocot was not observed during protocol-level rare plant surveys in May and July during its blooming time. Nearest current CNDDB occurrence record is approximately 8 miles west of the BSA in Point Reyes National Seashore.	NA
Pitkin marsh lily	*Lilium pardalinum* ssp. *pitkinense*	FE/SE/1B.1	Mesic, sandy. Cismontane woodland, meadows and seeps, and marshes and swamps (freshwater). Elevation 115 – 215 feet.	None. Known only from one marsh area near Sebastopol, Sonoma County (USFWS 2009). Not observed during protocol-level rare plant surveys in July during species blooming time.	**No Effect.** Based on protocol level rare plant surveys, the species was not observed in the BSA and the area is outside the species known range; therefore, the Project will have no effect to this species or its habitat.
Point Reyes meadowfoam	*Limnanthes douglasii* ssp. *sulphurea*	-/SE/1B.1	Coastal prairie, Marshes and swamps (freshwater), Meadows and seeps (mesic), Vernal pools. Elevation 0 – 460 feet.	None. No suitable habitat in the BSA.	NA
Tidestrom's lupine	*Lupinus tidestromii*	FE/SE/1B.1	Coastal dunes. Elevation 0 – 330 feet.	None. No suitable habitat in the BSA.	**No Effect.** No suitable habitat in the BSA.

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Marsh microseris	*Microseris paludosa*	-/-/1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Elevation 15 – 1,165 feet.	None. No suitable habitat in the BSA.	NA
Northern curly-leaved monardella	*Monardella sinuata* ssp. *nigrescens*	-/-/1B.2	Sandy. Chaparral (Santa Cruz County), coastal dunes, coastal scrub, lower montane coniferous forest (Santa Cruz County, ponderosa pine sandhills). Elevation 0 – 990 feet.	None. No suitable habitat in the BSA.	NA
Baker's navarretia	*Navarretia leucocephala ssp. bakeri*	-/-/1B.1	Mesic. Cismontane woodland, lower montane coniferous forest, meadows and seeps, valley and foothill grassland, and vernal pools. Elevation 15 – 5710 feet.	None. No suitable habitat in the BSA.	NA
Marin County navarretia	*Navarretia rosulata*	-/-/1B.2	Serpentinite, rocky. Closed-cone coniferous forest and chaparral. Elevation 660 – 2,095 feet.	None. No serpentine habitat in the BSA.	NA
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	-/-/-	Pickleweed and arrow grass dominant plants; plus intertidal mud flats.	None. No suitable habitat in the BSA. Sensitive community is outside of project alignment.	NA
White-rayed pentachaeta	*Pentachaeta bellidiflora*	FE/SE/1B.1	Cismontane woodland, Valley and foothill grassland (often serpentinite). Elevation 110 – 2,035 feet.	None. No suitable habitat in the BSA.	NA
North Coast phacelia	*Phacelia insularis* var. *continentis*	-/-/1B.2	Sandy, sometimes rocky. Coastal bluff scrub and coastal dunes. Elevation 35 – 560 feet.	None. No suitable habitat in the BSA.	NA
Point Reyes rein orchid	*Piperia elegans* ssp. *decurtata*	-/-/1B.1	Coastal bluff scrub, Coastal prairie. Elevation 50 – 605 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Hairless popcornflower	*Plagiobothrys glaber*	-/-/1A	Meadows and seeps (alkaline), Marshes and swamps (coastal salt). Elevation 45 – 590 feet	None. There is no suitable habitat in the BSA, and this species is presumed extinct.	NA
Petaluma popcorn flower	*Plagiobothrys mollis* var. *vestitus*	-/-/1A	Marshes and swamps (coastal salt) and valley and foothill grassland (mesic). Elevation 30 – 165 feet.	None. Known only from the type collection (in 1880) near Petaluma, Sonoma County. Presumed extirpated in California.	NA
North Coast semaphore grass	*Pleuropogon hooverianus*	-/ST/1B.1	Open areas, mesic. Broadleafed upland forest, meadows and seeps, and North Coast coniferous forest. Elevation 33 – 2,201 feet.	None. No suitable habitat in the BSA.	NA
Marin knotweed	*Polygonum marinense*	-/-/3.1	Marshes and swamps (brackish, coastal salt). Elevation 0 – 35 feet.	None. There is no suitable habitat within the BSA. CNDDB occurrence is located approximately 1.6 miles northwest of the BSA.	NA
Tamalpais oak	*Quercus parvula* var. *tamalpaisensis*	-/-/1B.3	Lower montane coniferous forest. Elevation 330 - 2,475 feet.	None. No suitable habitat in the BSA.	NA
California beaked-rush	*Rhynchospora californica*	-/-/1B.1	Bogs and fens, Lower montane coniferous forest, Marshes and swamps (freshwater), Meadows and seeps (seeps). Elevation 150 – 3,315 feet.	None. No suitable habitat in the BSA.	NA
Sanford's arrowhead	*Sagittaria sanfordii*	-/-/1B.2	Marshes and swamps (assorted shallow freshwater). Elevation 0 – 2,135 feet.	None. There is no suitable habitat within the BSA. The nearest suitable habitat is adjacent to the BSA in Olema Marsh.	NA
Point Reyes checkerbloom	*Sidalcea calycosa* ssp. *rhizomata*	-/-/1B.2	Marshes and swamps (freshwater, near coast). Elevation 10 – 246 feet.	None. This perennial dicot was not observed during protocol-level rare plant surveys in May and July during its blooming time. Nearest current CNDDB occurrence record is approximately 4.5 miles west of the BSA in Point Reyes National Seashore.	NA
Marin checkerbloom	*Sidalcea hickmanii* ssp. *viridis*	-/-/1B.3	Chaparral (serpentinite). Elevation 165 – 1,420 feet.	None. No serpentine chaparral habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Purple-stemmed checkerbloom	*Sidalcea malviflora* ssp. *purpurea*	-/-/1B.2	Broadleafed upland forest, Coastal prairie. Elevation 50 – 280 feet.	None. No suitable habitat in the BSA.	NA
Scouler's catchfly	*Silene scouleri* ssp. *scouleri*	-/-/2B.2	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland. Elevation 0 – 1,970 feet.	None. No suitable habitat in the BSA.	NA
Santa Cruz microseris	*Stebbinsoseris decipiens*	-/-/1B.2	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.	None. No suitable habitat in the BSA.	NA
Mount Burdell jewelflower	*Streptanthus anomalus*	-/-/1B.1	Cismontane woodland (openings). Elevation 165 – 490 feet.	None. No suitable habitat in the BSA.	NA
Tamalpais jewel-flower	*Streptanthus batrachopus*	-/-/1B.3	Serpentinite. Closed-cone coniferous forest and chaparral. Elevation 1,000 – 2,135 feet.	None. No serpentine habitat in the BSA.	NA
Mt. Tamalpais bristly jewel-flower	*Streptanthus glandulosus* ssp. *pulchellus*	-/-/1B.2	Serpentinite. Chaparral and valley and foothill grassland. Elevation 495 – 2,640 feet.	None. No serpentine habitat in the BSA.	NA
Whiteworm lichen	*Thamnolia vermicularis*	-/-/2B.1	Chaparral, Valley and foothill grassland. On rocks derived from sandstone. Rocky, Sandstone. Elevation 295 feet.	None. No suitable habitat in the BSA.	NA

Common Name	Scientific Name	Status[1] (Federal/ State/CRPR)	Habitat Requirements	Potential to Occur in the BSA[2]	Effect Finding for Federally Listed Species
Two-fork clover (Showy Indian clover)	*Trifolium amoenum*	FE/-/1B.1	Coastal bluff scrub and valley and foothill grassland (sometimes serpentinite). Elevation 0 - 985 feet.	None. No suitable habitat in the BSA.	**No Effect.** Based on site visits, there is no suitable habitat; therefore, the Project will have no effect to this species or its habitat.
Pacific Grove clover	*Trifolium polyodon*	-/SR/1B.1	Mesic, sometimes granitic. Closed-cone coniferous forest, coastal prairie, meadows and seeps, and valley and foothill grassland. Elevation 15 - 1395 feet.	None. There is no suitable habitat within the BSA. The nearest suitable habitat is adjacent to the BSA in Olema Marsh.	NA
San Francisco owl's-clover	*Triphysaria floribunda*	-/-/1B.2	Usually serpentinite. Coastal prairie, coastal scrub, and valley and foothill grassland. Elevation 30 – 530 feet.	None. No suitable habitat in the BSA.	NA
Coastal triquetrella	*Triquetrella californica*	-/-/1B.2	Soil. Coastal bluff scrub and coastal scrub. Elevation 30 – 330 feet.	None. No scrub habitat in the BSA.	NA

Appendix E 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 (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Invertebrates					
Obscure bumble bee	*Bombus caliginosus*	-- / SA	Inhabits open grassy coastal prairies and Coast Range meadows. Nesting occurs underground as well as above ground in abandoned bird nests. Food plants include *Ceanothus, Cirsium, Clarkia, Keckiella, Lathyrus, Lotus, Lupinus, Rhododendron, Rubus, Trifolium,* and *Vaccinium* (Williams *et al.* 2014).	**Low.** There is suitable habitat adjacent to the BSA in Olema Marsh, but there are no open grassy areas within the BSA.	**N/A**
Western bumble bee	*Bombus occidentalis*	-- / CE	Nests occur in underground cavities such as old mammal burrows in shrubland and grassland.	**Low.** Individuals may occur within the BSA, but there is limited suitable nesting habitat within the BSA.	**N/A**

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
San Bruno elfin butterfly	*Callophrys mossii bayensis*	FE / SA	Occurs only on north-facing slopes within the fog belt where its hostplant, stonecrop (*Sedum spathulifolium*) grows. Stonecrop grows in coastal grassland and low scrub on thin, rocky soils.	**None.** No suitable habitat within the BSA. Hostplant was not observed during rare plant surveys. Populations restricted to San Mateo County.	**No Effect.** No suitable habitat within the BSA, and not expected in Marin County.
Monarch Butterfly	*Danaus plexippus*	FC / SA	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (Eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larvae develop on milkweed (Asclepias spp.). Typically roost within 1.5 miles from the coast.	**Low.** May occasionally travel through or forage in the area.	**No Effect.**
Black abalone	*Haliotis cracherodii*	FE / SA Critical Habitat	Rocky substrates along the coast. Rarely found north of California.	**None.** No suitable habitat within the BSA.	**No Effect.** Not expected to occur in Marin County. **No Effect to Critical Habitat**. None within the BSA
California linderiella	*Linderiella occidentalis*	-- / SA	Vernal pools with low total dissolved solids.	**None.** No suitable habitat within the BSA.	**N/A**
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*.	**None.** No coastal dunes habitat within the BSA. Larval food plant was not found during rare plant surveys.	**No Effect.** No suitable habitat for Myrtle's silverspot butterfly.
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.	**High.** Suitable habitat is present. Known to occur in Lagunitas Creek.	**May Affect, Not Likely to Adversely Affect.**

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Marin hesperian	*Vespericola marinensis*	-- / SA	Spring seeps, streams. Found in moist spots in coastal brushfield and chaparral vegetation. Under leaves of cow-parsnip, around spring seeps, in leafmold along streams, in alder woods and mixed evergreen forest.	**Moderate.** Very little is known about the habitat requirements of this species. There are several records throughout Point Reyes. The BSA contains riparian woodlands and arroyo willow wetlands adjacent to chaparral vegetation.	**N/A**
Fish					
Green sturgeon	*Acipenser medirotris*	FT / SA Critical Habitat	The southern DPS of green sturgeon spawn in the mainstem Sacramento River. Juveniles remain in the Sacramento River, Delta, and San Francisco Bay Estuary for 2 – 4 years, before moving into the ocean to mature. Adult and sub-adult fish move into warmer coastal bays, including Tomales Bay, during periods of coldwater upwelling during the summer and early fall. Adults return to the Sacramento River to spawn.	**Low.** Adult and sub-adult green sturgeon are known to occur in Tomales Bay during the summer and early fall. Green sturgeon could forage along the tidal flats near the mouth of Lagunitas Creek adjacent to the BSA.	**May Affect, Not Likely to Adversely Affect.** The BSA includes Olema Creek which flows into Lagunitas Creek just north of the bridge. Due to the proximity to Lagunitas Creek, green sturgeon may be found in the BSA. **May Affect, Not Likely to Adversely Affect Critical Habitat.**
Tidewater goby	*Eucyclogobius newberryi*	FE / SA Critical Habitat	Occur in coastal estuaries and lagoons and transitional delta areas from San Diego Co. to the Smith River.	**Moderate.** Tidewater gobies are expected to occur in the tidally influenced areas of the lower Lagunitas Creek watershed. The BSA is adjacent to critical habitat.	**May Affect, Likely to Adversely Affect.** Tidewater gobies are known to occur in the Lagunitas Creek watershed. The BSA and adjacent waters provides suitable habitat. **May Affect, Not Likely to Adversely Affect Critical Habitat.** Impacts may occur to 0.008 acre of critical habitat. This is a small amount of critical habitat compared to the amount available. Project will

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
					not result in barrier to movement.
Southern coastal roach (formerly Tomales roach)	*Hesperoleucus venustus subditus*	-- / 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 Southern coastal roach (formerly Tomales Roach) is a subspecies endemic to the tributaries of Tomales Bay.	**Moderate.** They are known to occur in Lagunitas and Olema creeks.	**N/A**
Coho salmon - central California coast ESU	*Oncorhynchus kisutch*	FE / SE Critical Habitat; Essential Fish Habitat	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 estuaries, for two years, before emigrating to the Pacific Ocean to mature. Adult coho return to their natal streams to spawn as 3-year-old fish.	**High.** Coho are known to occur in Lagunitas and Olema creeks. The BSA provides migratory and rearing habitat.	**May Affect, Likely to Adversely Affect.** **May Affect, Likely to Adversely Affect Critical Habitat**
Steelhead - central California coast DPS	*Oncorhynchus mykiss irideus*	FT / SA Critical Habitat	Steelhead are found in streams with access to the ocean from Southern California to Alaska. They typically can inhabit higher gradient 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 the estuaries, for two years, before emigrating to the Pacific Ocean to mature. Adult steelhead may return to their natal streams to spawn after a	**High.** Steelhead are known to occur in Lagunitas and Olema creeks. The BSA provides migratory and rearing habitat.	**May Affect, Likely to Adversely Affect.** **May Affect, Likely to Adversely Affect Critical Habitat**

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
			few months to a few years in salt water. 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 to Aptos Creek, including San Francisco Bay.		
Longfin smelt	*Spirinchus thaleichthys*	FC / ST	Longfin smelt spawn in the lower Delta, then move down into San Francisco Bay as juveniles. Some move out into the Gulf of the Farallons at the end of their first year, before returning to the Delta to spawn in their second year.	**None.** Longfin smelt occur primarily in SF Bay and the Delta. Occasionally strays into Tomales Bay.	**No Effect.** Not expected to occur. **No Effect to Critical Habitat**. None within the BSA
Chinook Salmon	*N/A*	Essential Fish Habitat	Chinook Salmon Essential Fish Habitat includes areas surrounding the San Francisco Bay, Sacramento River and San Joaquin River.	**None.** Chinook salmon are not expected within the BSA.	**No Effect.** Not expected to occur.
Coastal Pelagics	*N/A*	Essential Fish Habitat	The Coastal Pelagics fishery includes four finfish (Pacific sardine, Pacific [chub] mackerel, northern anchovy, and jack mackerel) the invertebrate market squid, and all euphausiid (krill) species that occur in the West Coast Exclusive Economic Zone. San Francisco Bay and its tidally influenced coast are included in Coastal Pelagics Essential Fish Habitat.	**None.** No suitable aquatic habitat in the BSA.	**No Effect.** Not expected to occur.

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Pacific Coast Groundfish	*N/A*	Essential Fish Habitat	Groundfish types include rockfish, flatfish, roundfish, sharks and skates, and others. San Francisco Bay and its tidally influenced coast are included in Pacific Coast Groundfish Essential Fish Habitat.	**None.** No suitable aquatic habitat in the BSA.	**No Effect.** Not expected to occur.
Amphibians					
California giant salamander	*Dicamptodon ensatus*	-- / SSC	Occurs in wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages.	**Low.** Know to occur in the general area, but habitat is only marginally suitable.	**NA**
California red-legged frog	*Rana draytonii*	FT / SSC Critical Habitat	Breeds in ponds and pools in slow-moving streams with emergent vegetation; adjacent upland habitats are often used for temporary refuges or dispersal movements.	**High.** Suitable upland habitat present. CNDDB records within the BSA. Not likely for CRLF to breed in the BSA due to salinity levels but may disperse and use the BSA for upland habitat.	**May Affect, Likely to Adversely Affect.** **May Affect, Not Likely to Adversely Affect Critical Habitat**
Reptiles					
Northwestern pond turtle	*Actinemys marmorata*	PT / SSC Proposed Threatened	A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Nests in uplands up to 1,500 feet from water.	**High.** Suitable habitat and known population in Olema Creek.	**May Affect, Not Likely to Adversely Affect.**
East pacific green sea turtle	*Chelonia mydas*	FT / SA	Subtropical and temperate regions of the Atlantic, Pacific, and Indian Oceans.	**None.** No suitable habitat within the BSA.	**No Effect.** Not expected to occur.
Leatherback sea turtle	*Dermochelys coriacea*	FE / --	Typically found in the world's oceans.	**None.** No suitable habitat within the BSA.	**No Effect.** Not expected to occur.
Olive ridley sea turtle	*Lepidochelys olivacea*	FT / --	Pelagic species.	**None.** No suitable habitat within the BSA.	**No Effect.** Not expected to occur.

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Birds					
Tricolored Blackbird (nesting colony)	Agelaius tricolor	-- / ST, SSC	Nests colonially in marshes and upland scrubby vegetation.	**Moderate.** Suitable present in nearby Olema Marsh. Not likely to nest in BSA, but individuals may forage or fly through the BSA	**N/A**
Great egret (nesting colony)	*Ardea alba*	-- / SA	Nests colonially in trees and tall vegetation in a wide variety of habitats near open water foraging habitats.	**Moderate.** Suitable rookery trees throughout BSA, suitable foraging habitat within the BSA.	**N/A**
Great blue heron (nesting colony)	*Ardea herodias*	-- / SA	Variety of habitats close to bodies of water including fresh and saltwater marshes, wet meadows, lake edges and shorelines. Nests colonially in tall trees, cliffsides, and sequestered spots on marshes.	**Moderate.** Suitable rookery trees throughout BSA, suitable foraging habitat within the BSA.	**N/A**
Marbled murrelet	*Brachyramphus marmoratus*	FT / SA Critical Habitat	Feeds near-shore; nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir, along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz.	**None.** No suitable habitat within the BSA. Not known to occur in Marin County.	**No Effect.** Outside of species known distribution. **No Effect to Critical Habitat**. None within the BSA
Western snowy plover	*Charadrius nivosus nivosus*	FT / SSC Critical Habitat	Found on sandy beaches, salt pond levees & shores of large alkali lakes. Requires sandy, gravelly or friable soils for nesting.	**None.** No suitable beach habitat within the BSA.	**No Effect.** No suitable habitat. **No Effect to Critical Habitat**. None within the BSA
Yellow rail	*Coturnicops noveboracensis*	-- / SSC	Occur in shallow marshes with fairly short vegetation. For breeding, taller emergent vegetation like cattails does not attract Yellow Rails, but they sometimes nest nearby, where water is shallower and vegetation. Know to only overwinter on the west coast.	**Low.** May be found foraging in the BSA during the winter, but this species is not known to nest in this region.	**N/A**

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Short-tailed albatross	*Diomedea* (=*Phoebastria*) *albatrus*	FE / SSC	Found in open ocean habitat, forages in coastal waters, breeds on islands off the coast of Japan.	**None.** No suitable oceanic habitat within the BSA.	**No Effect.** Species not expected to occur within BSA.
Salt marsh common yellowthroat	*Geothlypis trichas sinuosa*	-- / SSC	Resident of fresh and saltwater marshes fringing the San Francisco Bay region. Requires thick, continuous cover down to water's surface for foraging, and tall grasses, bulrush patches, or willows for nesting.	**High.** Suitable nesting and foraging habitat present throughout the BSA.	**N/A**
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.	**Moderate.** No suitable nesting habitat within the BSA, marginally suitable foraging habitat. Known breeding population in nearby Olema Marsh.	**N/A**
Yellow warbler	*Setophaga petechia*	-- / SSC	Riparian plant associations in close proximity to water. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. Specific vegetation varies by locality.	**High.** Suitable nesting and foraging habitat within the BSA.	**N/A**
California least tern	*Sternula antillarum browni*	FE / SE, FP	Nests colonially on the ground in sandy or gravelly beaches. Forages over open water in coastal regions, including within San Francisco Bay.	**None.** No suitable beach habitat within the BSA.	**No Effect.** No Suitable habitat.

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Northern spotted owl	*Strix occidentalis caurina*	FE / SSC Critical Habitat	Old-growth forests or mixed stands of old-growth and mature trees, occasionally in younger forests with patches of big trees.	**Low.** No suitable habitat within the BSA. They do occur in the mixed hardwood forest to the west and east of the BSA. Closest occurrence is approximately 0.6 miles west of the BSA. While this species may fly through the area, the nearest suitable nesting habitat is approximately 0.3 miles west of the project. Spotted owl records within 2 miles of the BSA are included in Figure 12.	**No Effect.** No suitable nesting habitat within the BSA. **No Effect to Critical Habitat**. None within the BSA
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.	**N/A**
Point Reyes mountain beaver	*Aplodontia rufa phaea*	-- / SSC	Coastal area of Point Reyes in areas of springs or seepages; north-facing slopes of hills and gullies with sword fern and thimbleberry. Historic occurrences near Mt. Wittenberg, Bear Valley Ranch, and Inverness.	**None.** No suitable habitat within the BSA.	**N/A**
Guadalupe fur seal	*Arctocephalus townsendi*	FT /--	Guadalupe fur seals live in the waters off southern California and the Pacific coast of Mexico	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
Sei whale	*Balaenoptera borealis*	FE /--	Found in the world's oceans	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Blue whale	*Balaenoptera musculus*	FE / --	Found in the world's oceans	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
Fin whale	*Balaenoptera physalus*	FE / --	Found in the world's oceans	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
Townsend's big-eared bat	*Corynorhinus townsendii*	-- / SSC	Found throughout California in a wide variety of habitats; most commonly associated with mesic sites. Usually roosts in caves, mines, bridges, trees, and structures in or near woodlands and forests, often near water. Extremely sensitive to human disturbance.	**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.	**N/A**
North pacific right whale	*Eubalaena japonica*	FE / --	Found in the Pacific Ocean	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
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.	**Moderate.** Moderate potential for foraging only. Suitable foraging habitat present along creek corridor throughout BSA. 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.	**N/A**
Western red bat	*Lasiurus frantzii*	-- / SSC	Occurs throughout California primarily in riparian and woodland areas. Roosts singly or in small groups in shrub and tree foliage.	**Moderate.** Suitable riparian and woodland roosting habitat within BSA. Does not roost in bridges.	**N/A**
Sperm whale	*Physeter macrocephalus*	FE / --	Found in the Pacific Ocean	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.

Common Name	Scientific Name	Status (Fed/State)	Habitat Requirements	Potential to Occur in the BSA	Determination for federally listed species
Humpback whale	*Megaptera novaeangliae*	FE / --	Found in the world's oceans	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
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.	**High.** May occur in riparian and woodland areas throughout the BSA.	**N/A**
Southern resident killer whale	*Orcinus orca*	FE / --	Found in the Pacific Ocean	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
American badger	*Taxidea taxus*	-- / SSC	Prefers dry open stages of most shrub, forest, and herbaceous habitats. Requires sufficient prey base (mostly burrowing rodents), friable soils, and open, uncultivated ground.	**None.** No suitable habitat present in the BSA.	**N/A**
Cetaceans	*N/A*	N/A Marine Mammal Protection Act	The Cetacean taxonomic group includes whales, dolphins, and porpoises. Marine Habitat. Found in the world's oceans	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.
Pinnipeds	*N/A*	N/A Marine Mammal Protection Act	The Pinniped taxonomic group includes seals, sea lions, and walruses. Marine Habitat. Found in the world's oceans.	**None.** No suitable habitat within the BSA.	**No Effect.** No Suitable habitat.

Appendix F Tree Survey Data (2015)

Complete list of trees in BSA and identification tag numbers

ID	Species
3311	California buckeye
3312	Coast live oak
3313	California buckeye
3314	Coast live oak
3315	California bay
3316	Red Alder
3317	California bay
3318	Oregon Ash
3319	Oregon Ash
3320	California bay
3321	Oregon Ash
3322	Red Alder
3323	Red Alder
3324	California bay
3325	Coast live oak
3326	Coast live oak
3327	Coast live oak
3328	Coast live oak
3329	Coast live oak
3330	Coast live oak
3331	Coast live oak
3332	Coast live oak
3333	Coast live oak
3334	Coast live oak
3335	Coast live oak
3336	Coast live oak
3337	Coast live oak
3338	Coast live oak
3339	Coast live oak
3340	Coast live oak
3341	Coast live oak
3342	Coast live oak
3343	Coast live oak
3344	Coast live oak
3345	Coast live oak

ID	Species
3346	California bay
3347	Douglas fir
3348	Coast live oak
3349	Coast live oak
3350	Coast live oak
3351	Coast live oak
3352	Coast live oak
3353	Coast live oak
3354	Coast live oak
3355	Coast live oak
3356	Coast live oak
3357	Coast live oak
3358	Coast live oak
3359	Coast live oak
3360	California bay
3361	Coast live oak
3362	California bay
3363	California bay
3364	Coast live oak
3365	California bay
3366	California bay
3367	Coast live oak
3368	Coast live oak
3369	Coast live oak
3370	California bay
3371	Coast live oak
3372	Douglas fir
3373	Coast live oak
3374	Coast live oak
3375	Coast live oak
3376	Coast live oak
3377	Coast live oak
3378	Monterey pine
3379	Coast live oak
3380	Coast live oak

ID	Species
3381	Coast live oak
3382	Coast live oak
3383	Coast live oak
3384	Coast live oak
3385	Coast live oak
3386	Coast live oak
3387	Coast live oak
3388	Coast live oak
3389	Coast live oak
3390	Coast live oak
3391	Coast live oak
3392	Coast live oak
3393	Coast live oak
3393	Coast live oak
3394	Coast live oak
3395	Coast live oak
3396	Coast live oak
3397	Coast live oak
3398	Arroyo willow
3399	Arroyo willow
3400	Coast live oak
3401	Toyon
3402	Oregon ash
3403	California bay
3404	Coast live oak
3405	Coast live oak
3406	Coast live oak
3407	California bay
3408	Coast live oak
3409	Coast live oak
3410	Redwood
3411	Redwood
3412	Almond
3413	Coast live oak
3414	Coast live oak

Complete list of trees in BSA and identification tag numbers continued

ID	Species
3415	Coast live oak
3416	Coast live oak
3417	Coast live oak
3418	Coast live oak
3419	Coast live oak
3420	Coast live oak
3421	Coast live oak
3422	Coast live oak
3423	California bay
3424	California bay
3425	Coast live oak
3426	California bay
3427	California bay
3428	California bay
3429	White alder
3430	California bay
3431	California bay
3432	California bay
3433	California bay
3434	White alder
3435	White alder
3436	White alder
3437	White alder
3438	White alder
3439	White alder
3440	White alder
3441	Oregon ash
3442	California bay
3443	California buckeye
3444	California bay
3445	Douglas fir
3446	Coast live oak
3447	Coast live oak
3448	Coast live oak
3449	Coast live oak
3450	Coast live oak
3451	Coast live oak
3452	Coast live oak
3453	Coast live oak

ID	Species
3454	Coast live oak
3455	Coast live oak
3456	Coast live oak
3457	Coast live oak
3458	Coast live oak
3459	Coast live oak
3460	Coast live oak
3461	Arroyo willow
3462	California bay
3463	Coast live oak
3464	Coast live oak
3465	California bay
3466	Coast live oak
3467	California bay
3468	California bay
3469	California bay
3470	California bay
3471	Coast live oak
3472	Coast live oak
3473	Coast live oak
3474	California bay
3475	Coast live oak
3476	California bay
3477	Coast live oak
3478	California bay
3479	Coast live oak
3480	California bay
3481	California bay
3482	Coast live oak
3483	Eucalyptus
3484	Eucalyptus
3484	Eucalyptus
3486	Eucalyptus
3487	Eucalyptus
3488	Coast live oak
3489	Coast live oak
3490	Coast live oak
3491	Coast live oak

Appendix G 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	Oak/Bay
Equisetum telmateia. ssp. *braunii*	Giant horsetail	Oak/Bay
DENNSTAEDTIACEAE	BRACKEN FAMILY	
Pteridium aquilinum var. *pubescens*	Bracken fern	Oak/Bay
DRYOPTERIDACEAE		
Polystichum munitum	Western sword fern	Oak/Bay
POLYPODIACEAE	POLYPODY FAMILY	
Polypodium californicum	California polypody	Oak/Bay
GYMNOSPERMS		
CUPRESSACEAE	CYPRESS FAMILY	
Sequoia sempervirens	Coast redwood	Land
PINACEAE	PINE FAMILY	
Pinus radiata	Monterey pine	Oak/Bay
Pseudotsuga menziesii var. *menziesii*	Douglas fir	Oak/Bay
FLOWERING PLANTS: DICOTS		
ANACARDIACEAE	SUMAC FAMILY	
Toxicodendron diversilobum	Poison oak	Oak/Bay
APIACEAE	CARROT FAMILY	
*Foeniculum vulgare**	Fennel	Grass
Heracleum maximum	Common cowparsnip	Oak/Bay
Hypochaeris radicata	Rough cat's ear	Grass
Oenanthe sarmentosa	Water parsley	Oak/Bay
*Scandix pecten-veneris**	Shepard's needle	Oak/Bay
ASTERACEAE	SUNFLOWER FAMILY	
Artemisia douglasiana	Mugwort	Oak/Bay
*Cirsium vulgare**	Bull thistle	Grass
Baccharis pilularis	Coyote brush	Grass; Oak/Bay
*Carduus pycnocephalus**	Italian thistle	Grass; Oat
*Hypochaeris radicata**	Rough cat's ear	Grass
*Matricaria discoidea**	Pineapple weed	Grass
*Sonchus asper**	Prickly sow thistle	Grass; Oat
BETULACEAE	BEECH FAMILY	
Alnus rhombifolia	White alder	Oak/Bay
Alnus rubra	Red alder	Oak/Bay

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
BRASSICACEAE	MUSTARD FAMILY	
*Brassica nigra**	Black mustard	Grass; Oat
*Raphanus sativus**	Radish*	Grass
CAPRIFOLIACEAE	HONEYSUCKLE FAMILY	
Lonicera hispidula	Pink honeysuckle	Oak/Bay
Symphoricarpos albus	Snowberry	Oak/Bay
CARYOPHYLLACEAE	PINK FAMILY	
*Spergularia rubra**	Purple sand spurry	Oat
*Stellaria media**	Common chickweed	Oak/Bay
CONVOLVULACEAE	MORNING GLORY FAMILY	
*Convolvulus arvensis**	Bindweed	Grass; Oat
DIPSACACEAE	TEASEL FAMILY	
*Dipsacus fullonum**	Wild teasle	Oat
EUPHORBIACEAE	SPURGE FAMILY	
Croton setigerus	Dove weed	Oat
*Euphorbia peplus**	Petty spurge	Oat
FABACEAE	PEA FAMILY	
Acmispon americanus	Spanish lotus	Oat
*Acmispon wrangelianus**	Chilean trefoil	Grass
*Genista monspessulana**	French broom	Oak/Bay
*Lathyrus latifolius**	Sweet pea	Grass
Lotus corniculatus	Bird's foot trefoil	Grass; Oat
Lupinus bicolor	Annual lupine	Grass
*Medicago polymorpha**	Burclover	Grass; Oat
*Trifolium dubium**	Shamrock clover	Grass
*Trifolium hirtum**	Rose clover	Grass
*Trifolium repens**	White clover	Oat
*Vicia tetrasperma**	Four seeded vetch	Grass
*Vicia villosa**	Hairy vetch	Grass
FAGACEAE	OAK FAMILY	
Quercus agrifolia	Coast live oak	Oak/Bay; Grass
GENTIANACEAE	GENTIAN FAMILY	
*Centaurium pulchellum**	Branched centaury	Grass
GERANIACEAE	GERANIUM FAMILY	
*Erodium botrys**	Big heron bill	Oat
*Erodium cicutarium**	Red stemmed filaree	Grass; Oat
*Geranium dissectum**	Cut-leaf geranium	Grass; Oat

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
*Geranium robertianum**	Robert geranium	Grass; Oat
LAMIACEAE	MINT FAMILY	
*Mentha pulegium**	Pennyroyal	Grass
*Mentha spicata**	Spearmint	Oak/Bay
LAURACEAE	LAUREL FAMILY	
Umbellularia californica	California bay	Oak/Bay
LINACEAE	FLAX FAMILY	
*Linum bienne**	Narrow leaved flax	Grass
LYTHRACEAE	LOOSESTRIFE FAMILY	
Lythrum hyssopifolia	Hyssop loosestrife	Rush
MONTIACEAE	MINER'S LETTUCE FAMILY	
Claytonia perfoliata	Miner's lettuce	Oak/Bay
MYRSINACEAE	MYRSINE FAMILY	
*Anagallis arvensis**	Scarlet pimpernel	Grass
MYRTACEAE	MYRTLE FAMILY	
Eucalyptus globulus	Blue gum	Euc
Eucalyptus sp.	Eucalyptus	Euc
OLEACEAE	OLIVE FAMILY	
Fraxinus latifolia	Oregon ash	Oak/Bay
ONAGRACEAE	EVENING-PRIMROSE FAMILY	
Epilobium ciliatum	Slender willow-herb	Oak/Bay
Taraxia ovata	Sun cup	Grass
OXALIDACEAE	OXALIS FAMILY	
Oxalis oregano	Redwood sorrel	Oak/Bay
OROBANCHACEAE	BROOMRAPE FAMILY	
*Parentucellia latifolia**	Broadleaf glandweed	Grass
*Parentucellia viscosa**	Yellow glandweed	Grass
PAPAVERACEAE	POPPY FAMILY	
Eschscholzia californica	California poppy	Grass
PHRYMACEAE	LOPSEED FAMILY	
Mimulus guttatus	Seep monkey flower	Oak/Bay
PLANTAGINACEAE	PLAINTAIN FAMILY	

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
*Kickxia spuria**	Fluelin	Oat
*Plantago lanceolata**	English plantain	Grass; Oat
POLEMONIACEAE	PHLOX FAMILY	
Navarretia mellita	Skunk navarretia	Oak/Bay
POLYGONACEAE	BUCKWHEAT FAMILY	
*Rumex acetosella**	Sheep sorrel	Grass; Oat
*Rumex crispus**	Curly dock	Grass; Oat
*Rumex pulcher**	Fiddle dock	Grass; Oat
RANUNCULACEAE	BUTTERCUP FAMILY	
Ranunculus californicus	California buttercup	Grass
ROSACEAE	ROSE FAMILY	
Heteromeles arbutifolia	Toyon	Oak/Bay
*Prunus dulcis**	Almond	Oak/Bay
Rosa californica	California rose	Oak/Bay
*Rubus armeniacus**	Himalayan blackberry	Oak/Bay
Rubus parviflorus	Thimbleberry	
Rubus ursinus	California blackberry	Oak/Bay
RUBIACEAE	MADDER FAMILY	
Galium aparine	Common bedstraw	Oak/Bay
*Sherardia arvensis**	Field madder	Oak/Bay
SALICACEAE	WILLOW FAMILY	
Salix lasiolepis	Arroyo willow	Oak/Bay
SAPINDACEAE	SOAPBERRY FAMILY	
Aesculus californica	California buckeye	Oak/Bay
SCROPULARIACEAE	FIGWORT FAMILY	
Scrophularia californica	Bee plant	Oak/Bay
URTICACEAE	NETTLE FAMILY	
*Urtica dioica**	Stinging nettle	Oak/Bay
FLOWERING PLANTS: MONOCOTS		
AGAVACEAE	CENTURY PLANT FAMILY	
Chlorogalum pomeridianum	Soap plant	Oak/Bay
CYPERACEAE	SEDGE FAMILY	
Carex nudata	Torrent sedge	Oak/Bay
Cyperus eragrostis	Tall cyperus	Oak/Bay

SCIENTIFIC NAME[1]	COMMON NAME	HABITAT[2]
IRIDACEA	IRIS FAMILY	
Sisyrinchium bellum	Blue eyed grass	Grass
JUNCACEAE	RUSH FAMILY	
Juncus bufonius	Common toad rush	Rush
Juncus patens	Common rush	Oak/Bay
Juncus phaeocephalus	Brown headed rush	Rush
POACEAE	GRASS FAMILY	
*Aira caryophyllea**	Shiver grass	Grass
*Avena barbata**	Slender wild oat	Oat
*Briza maxima**	Rattlesnake grass	Grass
*Briza minor**	Little rattlesnake grass	Grass
*Bromus diandrus**	Ripgut brome	Grass
Bromus carinatus	California brome	Grass
*Bromus hordeaceus**	Soft chess	Grass
*Cynosurus echinatus**	Spiny dogtail	Oak/Bay
*Ehrharta erecta**	Panic veldtgrass	Oak/Bay
Elymus glaucus	Beardless wildrye	Grass
*Festuca myuros**	Rattail grass	Grass
*Festuca perennis**	Italian ryegrass	Grass; Oat
*Holcus lanatus**	Velvet grass	Oak/Bay
*Hordeum marinum**	Seaside barley	Grass
*Hordeum murinum**	Foxtail barley	Grass; Oat
*Paspalum dilatatum**	Dallis grass	Grass
*Phalaris aquatica**	Harding grass	Grass
*Poa annua**	Blue grass	Grass
*Polypogon monspeliensis**	Rabbitsfoot grass	Oak/Bay
Stipa pulchra	Purple needlegrass	Grass

Notes:

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

   * = non-native species

2. Oak/Bay = Coast live oak woodland / California bay forest; Euc = Eucalyptus groves; Rush = Iris-leaf rush seeps; Land = Landscaped; Grass = Mediterranean California naturalized annual and perennial grassland; and Oat = Wild oats grasslands

Appendix H Aquatic Resource Delineation

Delineation of Aquatic Resources



Sir Francis Drake Boulevard Bridge Replacement Project

Caltrans District 04

Marin County
Sir Francis Drake Boulevard
Bridge No. 27C0104
ID: BRLS-5927 (099)

September 2021

Prepared for:

Caltrans

COUNTY OF MARIN

Prepared by:

KLEINFELDER
Bright People. Right Solutions.

GANDA
GARCIA and ASSOCIATES

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Summary

The proposed project will replace an existing bridge (Bridge No. 27C0104) on Sir Francis Drake Boulevard (Blvd.) over Olema Creek in Point Reyes National Seashore, Marin County, California, just west of the intersection of Sir Francis Drake Blvd and State Route 1 (Figures 1 and 2). The existing bridge has been given a sufficiency rating of 51.4 and a status of functionally obsolete. The bridge was originally constructed in 1930 and was lengthened in 1967. The bridge has a long history of scour issues and debris build up at the piers. As part of the 1967 lengthening, scour mitigation measures were implemented at Pier 2, part of which appears to be acting as a check dam on the downstream side of the bridge. There is pattern cracking in the deck AC overlay and cracks have been identified on the bridge soffit and Pier 3. Additionally, the bridge railings are substandard and there are no approach guardrails. Based on a preliminary hydraulic analysis, the existing profile does not clear the 100-year storm event, nor does it clear the 50-year storm event with two feet of freeboard.

The proposed project will replace the existing bridge over Olema Creek with a new structure accommodating two 11-foot lanes, six-foot shoulders in each direction, and bridge barriers, resulting in an approximate bridge width of 38 feet. The roadway profile will be raised slightly, and the alignment will shift to the south to minimize impacts to the residential properties on the north. The new bridge will be a single-span, cast-in-place post-tensioned concrete slab approximately 77 feet in length. The roadway modifications are expected to begin approximately 1,000 feet to the south of the existing bridge and will conform approximately 700 feet to the west. Tree removal and the removal of other vegetation along the creek banks will be necessary for the project. Temporary creek diversion is anticipated in order to complete these activities within the waterway. Construction is expected to begin in the spring of 2025 and is anticipated to have a duration of 6 months.

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) and *Regulatory Guidance Letter Subject: Ordinary High Water Mark Identification* (USACE 2005).

In addition, the *Delineation of Potential Jurisdictional Wetlands and "Other Waters" Giacomini Wetland Restoration Project, Marin County, California* (Parsons 2005) and the *Supplement to Application for Individual Permit to U.S. Army Corps of Engineers San Francisco District, Giacomini Wetland Restoration Project, File: 27398N, Marin County, California* (USACE 2008b) was reviewed. The delineation of wetlands and waters conducted in 2005 by the Point Reyes National Seashore for the Giacomini Wetland Restoration Project included much of the BSA and the Supplement by the USACE in 2008 included jurisdictional verification for the Giacomini Wetland Restoration Project for most areas of the BSA (Parson 2005 and USACE 2008b).

Project planning began in 2015 and restarted in 2020 with a revised study area. Kleinfelder Plant Ecologist Constance Ganong and biologist Rebecca Doubledee conducted field investigations on July 22, August 20 and September 9, 2015 to delineate potential waters of the U.S., including wetlands and water features, in the biological study area (BSA), which at the time was 4.47 acres. Ms. Ganong conducted a revalidation field visit on November 6, 2020 at the BSA, which now totals 5.32 acres. The BSA is illustrated in Figures 1 and 2 of Appendix A.

A preliminary evaluation of jurisdiction is presented in this report. The approximately 1.35 acres of potential waters of the U.S. delineated within the BSA is proposed to be jurisdictional. This area includes 0.33 acre of historic Section 10 waters, 0.31 acre of current Section 10 waters (Olema Creek), 0.15 acre of Section 404 waters, and 0.62 acre of Section 404 wetlands. These features are illustrated in Appendix A and summarized in Table 4-1. Datasheets are included as Appendix C. Representative photographs of the BSA are included in Appendix D. Historic Section 10 jurisdictional areas (0.33 acre) were mapped using delineation maps for the Point Reyes National Seashore for the Giacomini Wetland Restoration Project, which used U.S. Coast Survey maps from 1862 (Parsons 2005; personal communication with L. Parsons on September 3, 2015) and were verified by the USACE on February 11, 2008 (USACE 2008b).

List of Abbreviated Terms

Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation Officials
Blvd.	Boulevard
BSA	Biological study area
Cal-IPC	California Invasive Plant Council
CCC	California Coastal Commission
Caltrans	California Department of Transportation
CFR	Code of Federal Regulations
CIDH	Cast-in-drilled-hole
CWA	Clean Water Act
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
FW	Freshwater wetland
GANDA	Garcia and Associates
GPS	Global Positioning System
HTL	High tide line
MHW	Mean high water
NL	Not listed
NRCS	National Resource Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
OHWM	Ordinary high water mark
OWUS	Other waters of the U.S.
ROW	Right-of-way
SR	State Route
UPL	Upland
U.S.	United States
USC	United States Code
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 proposed project will replace an existing bridge (Bridge No. 27C0104) on Sir Francis Drake Boulevard (Blvd.) over Olema Creek in Point Reyes National Seashore, Marin County, California, just west of the intersection of Sir Francis Drake Blvd and State Route 1 (SR 1) (Figures 1 and 2). The existing bridge (Bridge No. 27C0104) has been given a sufficiency rating of 51.4 and a status of functionally obsolete. The bridge was originally constructed in 1930 and was lengthened in 1967. The bridge has a long history of scour issues and debris build up at the piers. As part of the 1967 lengthening, scour mitigation measures were implemented at Pier 2, part of which appears to be acting as a check dam on the downstream side of the bridge. There is pattern cracking in the deck AC overlay and cracks have been identified on the bridge soffit and Pier 3. Additionally, the bridge railings are substandard and there are no approach guardrails.

Present Condition

Sir Francis Drake Blvd. is a two-lane, 24-foot wide, major collector that serves two-way traffic with a posted speed limit of 45 mph. The roadway currently includes 11-foot lanes with one-foot shoulders in each direction. Initially, the bridge was a 20-foot long, single-span, reinforced concrete slab. Following the 1967 lengthening, the bridge now consists of three spans with a total length of 58 feet. The roadway and structure do not meet current AASHTO standards due to the narrow width. Overhead telephone and electrical lines and underground water and communication lines, which are attached to the bridge, are present in the project area. Based on a preliminary hydraulic analysis, the existing profile does not clear the 100-year storm event, nor does it clear the 50-year storm event with two feet of freeboard.

Proposed Improvements

The proposed project will replace the existing bridge over Olema Creek with a new structure accommodating two 11-foot lanes, six-foot shoulders in each direction, and bridge barriers, resulting in an approximate bridge width of 38 feet. The roadway profile will be raised slightly and the alignment will shift to the south to minimize impacts to the residential properties on the north. The new bridge will be a single-span, cast-in-place post-tensioned concrete slab approximately 77 feet in length. The roadway modifications are expected to begin approximately 1,000 feet

to the south of the existing bridge and will conform approximately 700 feet to the west.

Aesthetics are expected to be incorporated into the new structure. At this time, the details of the bridge aesthetics are unknown, but will most likely include the use of formliner patterns on concrete barrier rails or the use of open bridge railings that will help to maintain the rural nature of the site. The height of the bridge railing is expected to be 54 inches to accommodate bicycle traffic along the road.

Relocation of overhead and underground utilities is anticipated as part of the project. Water and communication lines that are attached to the existing bridge will be relocated onto the new structure. If the existing water distribution line cannot be temporarily shut down to facilitate bridge construction, it will be relocated onto a temporary structure during construction. Further investigation is required to determine all utilities impacted and coordination with the utility providers for relocation.

Construction of the bridge will involve excavation and construction of concrete abutments supported on either driven piles or cast-in-drilled-hole (CIDH) piles. 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 falsework to support the cast-in-place structure while it reaches strength will be required within the waterway. Other temporary work within Olema Creek that is anticipated includes removal of the existing bridge, support and scour mitigation measures and construction of the new abutments. Temporary creek diversion is anticipated to complete these activities within the waterway. Construction is expected to begin in Spring 2025 and is anticipated to have a duration of six months.

Permanent right of way acquisition will be needed from the parcel along the south side of Sir Francis Drake Blvd. at the project site. Temporary construction easements will also be required from several parcels to provide access to the creek, adequate storage, staging areas, and reconstruct a private driveway.

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 (Olema Creek and Lagunitas

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

Road closure of Sir Francis Drake Blvd. over Olema Creek is anticipated to expedite construction of the replacement bridge and roadway approach work. Sir Francis Drake Blvd. provides the main access point to SR 1 and the Point Reyes Station community for those travelling to and from the Tomales Bay area. However, connectivity to SR 1 is also provided south of the project site via Bear Valley Road. The detour along Bear Valley Road is approximately four miles long and will add an additional 10 minutes of travel time for motorists. The detour option was vetted and received community support at the public meeting on May 31, 2018.

This report was prepared to assist Caltrans with planning efforts within the Biological Study Area (BSA) and to identify features with potential United States Army Corps of Engineers (USACE) jurisdiction pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbor Act. This report documents the location and extent of waters of the U.S. occurring within the BSA, which includes the areas that will be temporarily or permanently impacted by the proposed Project. The BSA for the Project totals approximately 5.32 acres.

2.0 ENVIRONMENTAL SETTING

2.1. Location

The project is located in Marin County, California, in Township 3N, Range 9W, Section 35-36 of the *Inverness* U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle (quad) at latitude 38.063961, longitude -122.810489. The BSA is within the community of Point Reyes Station, just west of SR 1 (Figures 1 and 2). The stretch of Sir Francis Drake Blvd through the project site begins at SR 1 and travels west along Lagunitas Creek before turning north and heading towards the western side of Tomales Bay. At Olema Creek the roadway is bordered by residential properties on the north and the Point Reyes National Seashore on the south. Olema Creek flows north under the bridge through the BSA to Lagunitas Creek.

To access the project area, take SR 1 to Sir Francis Drake Blvd. Driving south on SR 1, take a right on Sir Francis Drake Blvd. and driving north on SR 1 take a left on Sir Francis Drake Blvd.

2.2. Biological Study Area

The BSA totals approximately 5.32 aces and includes areas of potential impact from the project. When project plans began in 2015, the BSA was 4.47 acres. The BSA has been extended at the east and west ends of the BSA along Sir Francis Drake. It has also been reduced along the northern edge and extended along the southern edge of the BSA. Currently, the BSA consists of paved Sir Francis Drake Blvd., residential properties, and arroyo willow thickets. In addition, the BSA contains wetlands, one perennial creek, Olema Creek, and adjacent waters. The surrounding area consists of the town of Point Reyes Station and Point Reyes National Seashore.

The BSA is located within the Tomales Bay Watershed. The Lagunitas Creek subwatershed is the largest drainage into Tomales Bay, and its major tributaries include San Geronimo Creek, Devil's Gulch, Cheda Creek, Nicasio Creek, and Olema Creek. At the southwestern edge of the watershed, Olema Creek flows in a nearly straight line through a rift valley along the San Andreas Fault. Olema Creek flows north through the BSA where it connects to Lagunitas Creek, which then ends at Tomales Bay.

2.3. Vegetation Types

Four terrestrial vegetation types were identified within the 5.32 acres of the BSA. The classification of vegetation used in this report is based on *A Manual of California Vegetation* 2nd Edition (Sawyer et al. 2009). One vegetation type is not described in Sawyer et al. 2009 because it consists of landscaped vegetation. The four vegetation types are described below.

2.3.1. Arroyo Willow thickets: *Salix lasiolepis* Shrubland Alliance

Arroyo willow (*Salix lasiolepis*) is a riparian tall shrub or tree that may grow to approximately 25 feet tall. Arroyo willow grows on seasonally or intermittently flooded sites, such as stream banks, slope seeps, and drainages. Within Point Reyes National Seashore arroyo willow stands are structurally variable, where most stands are tall shrublands and some are forests that dominate the canopy

with at least 50% relative cover (Schirokauer *et al*. 2003). The understory is extremely dense due to the thicket-forming growth habit of this species.

Arroyo willow thicket is the predominate vegetation in the BSA and occur on both sides of Sir Francis Drake Blvd. Within the upland areas of arroyo willow thicket, the understory is extremely dense with shrub dominates such as California blackberry (*Rubus ursinus*), poison oak (*Toxicodendron diversilobum*), and coast twin berry (*Lonicera involucrate* var. *ledebourii*). Herbaceous plants include stinging nettle (*Urtica dioica*) and California bee plant (*Scrophularia californica*). Some areas of the arroyo willow thicket contain *Salix lasiolepis–Rubus ursinus* association as described in the Point Reyes National Seashore-Golden Gate National Recreation Community Key (Schirokauer *et al*. 2003). The herbaceous layer under the arroyo willow wetland canopy included lady fern (*Athyrium filix-femina*), water parsley (*Oenanthe sarmentosa*), and coast carex (*Carex obnupta*).

2.3.2. Box-elder Forest: *Acer negundo* Forest Alliance

Box-elder (*Acer negundo*) is a deciduous hardwood that grows to approximately 65 feet in height and lives 60 years or more. Box-elder is a wide-ranging species in North America. The alliance is limited mainly in California to riparian zones of streams and rivers that are regularly flooded.

A small area of box-elder forest is between the poison hemlock patch and an arroyo willow thicket south of Sir Francis Drake Blvd at the west end of the BSA. The understory here is very sparse but included California blackberry, lady fern, and stinging nettle.

2.3.3. Hardstem Bulrush Marsh: *Schoenoplectus acutus* Herbaceous Alliance

Hardstem bulrush (*Schoenoplectus acutus*) is a tule that can reach 10 feet tall. The alliance is widespread, freshwater to slightly brackish marsh type. Hardstem bulrush habitat includes streams, around ponds and lakes, and in sloughs, swamps, freshwater and brackish marshes, and roadside ditches.

Within the BSA there is a small area of bulrush marsh south of the bridge along the banks of Olema Creek.

2.3.4. Poison Hemlock Patch: *Conium maculatum* Semi-Natural Herbaceous Stands

Poison hemlock (*Conium maculatum*) is a short-lived perennial from Europe. California Invasive Plant Council (Cal-IPC) lists the species as invasive in wildland settings in the state and it has a Cal-IPC rank of Moderate (Cal-IPC 2020). Poison hemlock occurs in relatively moist locations and is tolerant of semi-shade, such as bottomlands and swales. All parts of the plant are toxic to humans, especially seeds and young leaves.

Within the BSA, there is a poison hemlock patch between the arroyo willow thicket and the box-elder forest south of Sir Francis Drake Blvd. The patch also consists of teasel (*Dipsacus fullonum*).

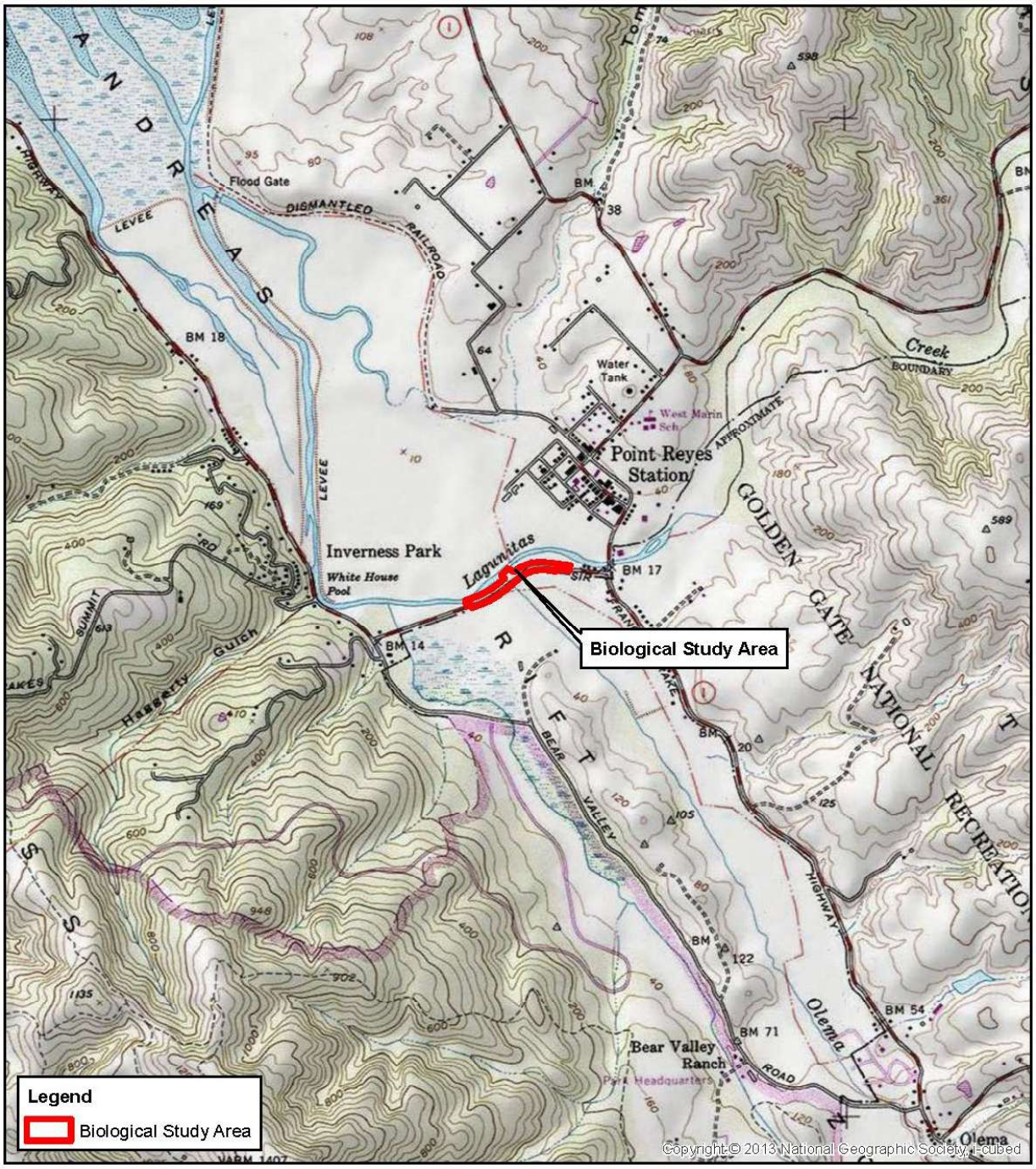
2.3.5. Landscaped

Landscaped areas have been impacted by grading, mowing, filling, and residential and commercial use. Ornamental trees and shrubs are planted on private property and along residential driveways within the BSA. Ruderal vegetation such as non-native, invasive forbs and grasses also occur within this area of the BSA.

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), 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/or 3) wetland hydrology. Sample points were assessed at paired plots on 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/or wetland hydrology indicators were mapped as wetlands. Tidal navigable water features were delineated by the mean high water (MHW) and ordinary high water mark (OHWM) for non-tidal 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 2020) and aerial photography of the BSA and vicinity. The *Inverness* California USGS 7.5-minute topographic quad was also reviewed (USGS 2020).

In addition, the *Delineation of Potential Jurisdictional Wetlands and "Other Waters" Giacomini Wetland Restoration Project, Marin County, California* (Parsons 2005) and the *Supplement to Application for Individual Permit to U.S. Army Corps of Engineers San Francisco District, Giacomini Wetland Restoration Project, File: 27398N, Marin County, California* (USACE 2008b) was reviewed. The delineation of wetlands and waters conducted in 2005 by the Point Reyes National Seashore for the Giacomini Wetland Restoration Project included much of the BSA and the Supplement by the USACE in 2008 included jurisdictional verification for the

Giacomini Wetland Restoration Project for most areas of the BSA (Parson 2005 and USACE 2008b).

Soil types in the BSA were identified using the Web Soil Survey, a resource provided by the National Resources Conservation Service ([NRCS] 2020). The following soil units were identified within the BSA (see Appendix B: Custom Soil Resource Report for soil description and mapping):

- Barnabe very gravelly loam, 30 to 50 percent slopes (103)
- Blucher-Cole complex, 2 to 5 percent slopes (105)
- Fluvents, channeled (127)

3.2. Field Investigation

Field investigations to delineate wetlands and water features within the preliminary 4.47 acres of the BSA were conducted on July 22, August 20, and September 9, 2015 by Garcia and Associates (GANDA) Plant Ecologist Constance Ganong and biologist Rebecca Doubledee. On November 6, 2020, Ms. Ganong revalidated the site and took additional data points. Wetlands were identified based on vegetation, soils, and hydrology.

Water features were mapped based on the determination of MHW for Olema Creek and historic MHW for Lagunitas Creek and OHWM mark for adjacent waters in the BSA. Potential waters of the U.S. (wetlands and water features) and sample point locations were mapped in the field using a Trimble Global Positioning System (GPS) survey unit capable of sub-meter accuracy. Sample points in the BSA were evaluated at eight locations in 2015 and at four locations in 2020. Sample points shown in the map in Appendix A correspond to the datasheets in Appendix C. Representative photographs of the BSA and wetland and water features are included as Appendix D.

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 size of the sample plots represented the vegetation community and size in the feature and excluded sampling

vegetation from adjacent communities. Plot sizes are listed in the datasheets in Appendix C.

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: 2018 version 3.4* (USACE 2020). 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). Species not listed in the *National List* are designated as 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 plants (OBL)	Almost always occur in wetlands. With few exceptions, these plants (herbaceous or woody) are found in standing water or seasonally saturated soils (14 or more consecutive days) near the surface.
Facultative wetland plants (FACW)	Usually occur in a wetland but may occur in non-wetlands. These plants predominantly occur with hydric soils, often in geomorphic settings where water saturates the soils or floods the soil surface at least seasonally.
Facultative plants (FAC)	Occur in wetlands and non-wetlands. These plants can grow in hydric, mesic, or xeric habitat. The occurrence of these plants in different habitats represents responses to a variety of environmental variables other than just hydrology, such as shade tolerance, soil pH, and they have a wide tolerance of soil moisture conditions.

Indicator Category	Wetland Occurrence
Facultative upland plants (FACU)	Usually occur in non-wetlands but may occur in wetlands. These plants predominantly occur on drier or more mesic sites in geomorphic settings where water rarely saturates the soils or floods the soil surface at least seasonally.
Upland plants (UPL)	Almost never occur in wetlands. These plants occupy mesic to xeric non-wetland habitats. They almost never occur in standing water or saturated soils. Typical growth includes herbaceous, shrubs, woody vines, and trees.
Source: Lichvar et. al. 2012	

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, such as saturated soils, water marks, drift deposits, surface soil cracks, and water stained leaves at the wetland sites.

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

3.4.1. Delineating Section 10 Jurisdiction

Section 10 jurisdiction extends to MHW and includes tidal areas presently subject to tidal influence, and/or those that are presently used, have been used in the past, or could be used for interstate transport or foreign commerce, as well as unfilled areas currently behind levees that were historically below MHW. Within the BSA, the probable historic extent of Section 10 tidal waters, (areas historically likely to be below MHW) were mapped based on the delineation by Point Reyes National

Seashore for the Giacomini Wetland Restoration Project, which used U.S. Coast Survey maps from 1862 (Parsons 2005; personal communication with L. Parsons on September 3, 2015), and were verified by the USACE (USACE 2008b).

MHW is the average height of all high tides and is determined from the nearest tide level station. The nearest tide level station to the BSA is in Inverness in Tomales Bay, CA (National Oceanic and Atmospheric Administration Station [NOAA] ID 9415228; NOAA 2020). The width of Olema Creek was estimated within the BSA by reference to physical markings, lines of vegetation, and changes in the type of vegetation (33 Code of Federal Regulations [CFR] 329.12).

3.4.2. Delineating Section 404 Jurisdiction

If adjacent or bordering, neighboring, or contiguous “waters” are present above the high tide or ordinary high water (OHWM) marks, then USACE jurisdiction extends to the limit of the adjacent feature. Wetlands separated from other waters of the U.S. by man-made dikes or barriers, natural river berms, beach dunes and the like are “adjacent wetlands” (33CFR 328.3[c]). Potential wetlands must meet the three parameter criteria as outlined in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987). Areas that support more than 5 percent cover of vegetation are classified as wetlands, and areas that have standing water and/or support less than 5 percent vegetation cover are classified as waters (USACE 1987).

The lateral edges of the nontidal creeks within the BSA (adjacent waters) 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 includes tidal and non-tidal wetlands and "other waters" subject to USACE jurisdiction under Section 404 and Section 10 regulations. A total of approximately 0.64 acre of potential jurisdictional Section 10 waters (including historic Section 10 waters) and a total of approximately 0.77 acre of potential jurisdictional Section 404 waters, including wetlands, were delineated within the 5.32 acres of the BSA. These features are illustrated in Appendix A and summarized in Table 4-1. Datasheets are included as Appendix C. Representative photographs of areas of the current BSA and soil sample points are included in Appendix D.

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

4.1. Section 10 Waters

Within the BSA, the probable historic extent of Section 10 tidal waters were mapped based on the delineation by Point Reyes National Seashore for the Giacomini Wetland Restoration Project, which used U.S. Coast Survey maps from 1862 (Parsons 2005; personal communication with L. Parsons on September 3, 2015), and were verified by the USACE on February 11, 2008 (USACE 2008b). Approximately 0.33 acre of potential historic Section 10 jurisdictional waters were mapped within the Olema Creek floodplain in the BSA (HW-1). This area was historically subtidal or intertidal and, therefore, below MHW before being diked or culverted/bridged. The historic extent of this area occurs along Sir Francis Drake Blvd within arroyo willow thicket and the roadway (Appendix A).

In addition, the perennial creek (W-1) in the BSA is Olema Creek, which flows northwest from just outside of the BSA directly into Lagunitas Creek. Olema Creek is tidally influenced within the BSA and is considered potential Section 10 jurisdictional waters. The MHW for Olema Creek within the BSA was calculated as 4.93 feet NAVD88 (NOAA 2020). Within the BSA, Olema Creek is approximately 156 feet wide and 215 feet long and approximately 0.31 acre.

Perennial creek habitat within the BSA contains vegetation such as torrent sedge (*Carex nudata*; FACW) and hardstem bulrush (*Schoenoplectus acutus*) within the active creek channel, which is shadowed by over-story trees, including arroyo

willow (*Salix lasiolepis;* FAW) and white alder (*Alnus rhombifolia*: FACW) (Photo 1 Appendix C).

4.2. Adjacent Waters

Potential jurisdictional Section 404 non-wetland waters include the adjacent waters at the west end of the BSA, south of Sir Francis Drake Blvd. These waters are hydrologically connected to or contiguous with Lagunitas Creek by a channel which flows under Sir Francis Drake Blvd to the west of the BSA.

The adjacent water feature (AWA-1) totals approximately 0.15 acre in the BSA. This area was classified as waters because it had standing water or supported less than 5 percent vegetation cover (Photo 2 Appendix C). Herbaceous plants in this area included water parsley (*Oenanthe sarmentosa*; OBL) and lady fern (*Athyrium filix-femina* var. *cyclosorum*; FAC). Overstory trees included arroyo willow and California buckeye (*Aesculus californica;* not listed).

4.3. Adjacent Wetlands

The adjacent wetlands within the BSA are characterized by a tall shrub layer dominated by arroyo willow, and it's alliance type is arroyo willow thickets, which in Point Reyes National Seashore are structurally variable where most stands are tall shrublands, with some forests (Schirokauer *et al*. 2003). This category is synonymous with "palustrine forested wetland" as classified by Cowardin (Cowardin *et al*. 1979) since many of the arroyo willow were more than 20 feet in height. Many areas of the BSA were difficult to access because of dense vegetation, which included poison oak and stinging nettle.

The adjacent wetlands are contiguous with the adjacent waters and Olema Creek and occur south of Sir Francis Drake Blvd beyond fill or berms along the roadway. Three sample points (1, 2, 5, and W12) were taken within the wetlands. Sample Points 1, 2, and 5 were taken in 2015 and Sample Point W12 was taken in 2020.

Adjacent Wetland 1 ([AWA-1], approximately 0.19 acre) and Adjacent Wetland 2 ([AWA-2], approximately 0.26 acre) are on each side of the Olema Marsh Trail and are presumed to be hydrologically connected (Appendix A; Photo 3 Appendix C). The plot sizes were each 10 feet by 10 feet. The dominant tree at each point was arroyo willow (FACW) and the dominant herb at each was water parsley (OBL). Saturation (3) was present at each site at the time of the survey in 2015. The hydric

soil indicator at each site was redox dark surface (F6) and the soil texture was silty clay loam.

In 2020, Sample Point W12 exhibited all three necessary wetland indicators. The dominant tree was arroyo willow (FACW), the hydric soil indicator was redox dark surface (F6), and the sample area exhibited oxidized rhizospheres along living roots (C3).

Adjacent Wetland 3 (AWA-3), which is approximately 0.17 acre, is northeast of Olema Creek and follows the contour of the creek. Sample Point 5 was taken in 2015. The plot size was 10 feet by 10 feet. The dominant tree at the sample area was arroyo willow (FACW) and the dominant shrub was coast twinberry (FAC). Saturation (3) and water-stained leaves (B9) were present at the site at the time of the survey in 2015. Although a hydric soil indicator was not present, it was presumed to be an adjacent wetland due to the proximity to Olema Creek and within its floodplain, as well as exhibiting the other two indicators necessary for a wetland.

Table 4-1. Summary of Acreage of Aquatic Resources within the 5.32 acres of the BSA (see Appendix A)

Aquatic Resource Name	Location (Latitude/Longitude)	Area (Acres)	Linear Feet
Section 10 Waters			
HW-1	38.063460, -122.811532	0.33	400
W-1	38.063919, -122.810440	0.31	215
	Total	**0.64**	**615**
Section 404 Waters – Adjacent Waters			
AWA-1	38.062935, -122.812223	0.15	260
	Total	**0.15**	**260**
Section 404 Wetlands – Adjacent Wetland			
AWE-1	38.063141. -122.811560	0.19	328
AWE-2	38.063259, -122.811120	0.26	390
AWE-3	38.064113, -122.809799	0.17	250
	Total	**0.62**	**968**
	Total Aquatic Resources	**1.41**	**1,843**

5.0 OTHER MAPPING CRITERIA

5.1. California Coastal Commission

Potential USACE jurisdictional waters and wetlands within the BSA may also fall within jurisdiction of the California Coastal Commission (CCC). The CCC uses a one parameter wetland definition that only requires evidence of a single parameter to establish wetland conditions (14 CCR § 13577). Areas also meeting this single parameter definition were delineated. A wetland map using the CCC definition is provided in Appendix E for potential future permitting needs.

5.2. National Park Service

The BSA is located entirely within National Park Service land. The National Park Service uses a modified Cowardin approach to identifying wetlands (Cowardin *et al*. 1979; personal communication with K. Ward on June 10, 2015). Their approach

requires the presence of wetland hydrology and either the presence of hydric soils or hydrophytic vegetation, except in non-soil areas, such as rocky intertidal areas, where the presence of proper hydrology is required (Parson *et. al.* 2005). Cowardin mapping was conducted for the entire BSA by Point Reyes National Seashore for the Giacomini Wetland Restoration Project (Parson *et al.* 2005) and is reproduced in Appendix F

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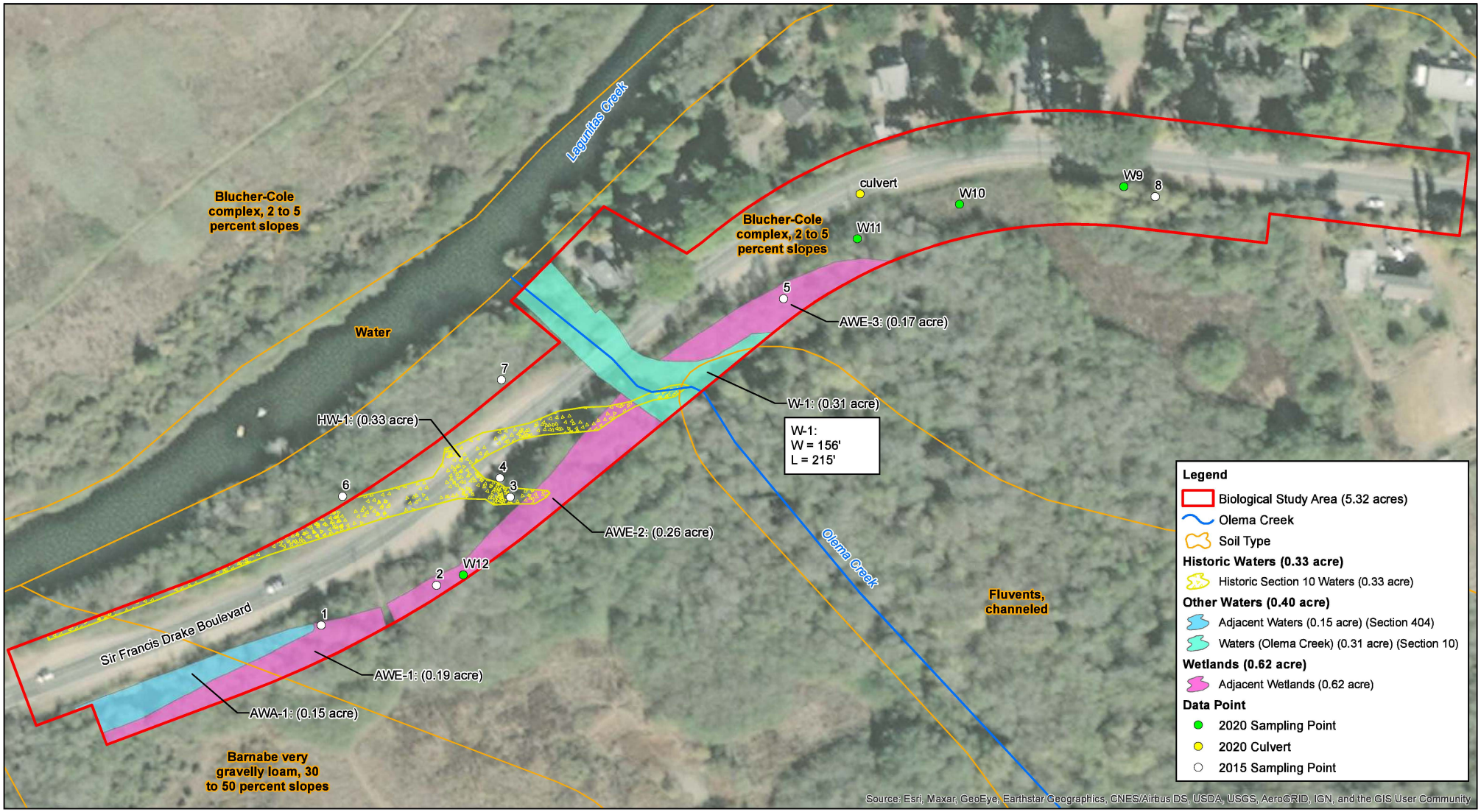
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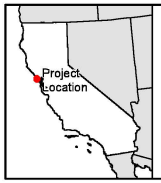
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Appendix A:
Aquatic Resources Delineation Map





USGS 7.5' Quad:
Inverness (1976)

Legal Description:
T3N, R9W Sections 35, 36

Delineation by Constance Ganong and Rebecca Doubledee
on July 22, August 20 and September 9, 2015
and Constance Ganong on November 6, 2020.
Date of Map: 11/24/20

N

Scale 1:1,200
1 Inch = 100 Feet

0 10 20 Meters

0 50 100 Feet

Appendix A:
Potential Jurisdictional Section 404 Wetlands and Waters and Section 10 Waters
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema 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



November 25, 2020

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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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.

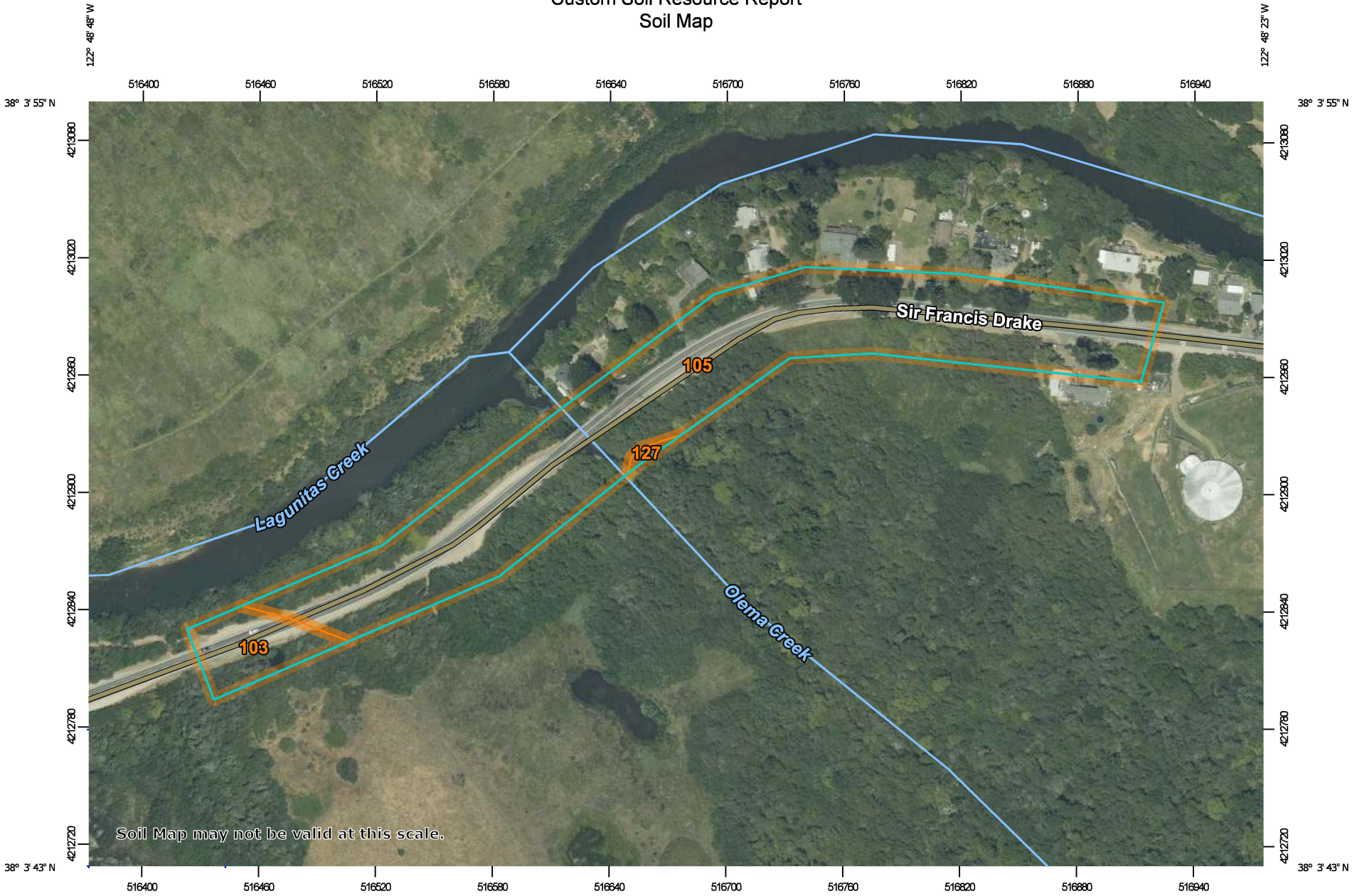
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

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



Map Scale: 1:2,760 if printed on A landscape (11" x 8.5") sheet.

N

0 40 80 160 240 Meters

0 100 200 400 600 Feet

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 14, May 29, 2020

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

Date(s) aerial images were photographed: Jul 2, 2019—Jul 5, 2019

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

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
103	Barnabe very gravelly loam, 30 to 50 percent slopes	0.5	8.7%
105	Blucher-Cole complex, 2 to 5 percent slopes	5.4	90.7%
127	Fluvents, channeled	0.0	0.5%
Totals for Area of Interest		**5.9**	**100.0%**

Map Unit Descriptions

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

103—Barnabe very gravelly loam, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: hf16
Elevation: 50 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 360 days
Farmland classification: Not prime farmland

Map Unit Composition

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

Description of Barnabe

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/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: 30 to 50 percent
Depth to restrictive feature: 10 to 20 inches to lithic bedrock
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 capacity: Very low (about 1.5 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: D

Minor Components

Saurin

Percent of map unit: 4 percent
Hydric soil rating: No

Cronkhite
Percent of map unit: 4 percent
Hydric soil rating: No

Rock outcrop
Percent of map unit: 3 percent
Hydric soil rating: No

Slopes less than 30 percent
Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed, shallow
Percent of map unit: 2 percent
Hydric soil rating: No

105—Blucher-Cole complex, 2 to 5 percent slopes

Map Unit Setting
National map unit symbol: hf18
Elevation: 0 to 500 feet
Mean annual precipitation: 25 to 35 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 210 to 290 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
Blucher and similar soils: 40 percent
Cole and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blucher

Setting
Landform: Basin floors, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Concave, linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone, granite, or shale

Typical profile
H1 - 0 to 7 inches: silt loam
H2 - 7 to 23 inches: silt loam
H3 - 23 to 60 inches: clay loam

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained

Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 10.4 inches)

Interpretive groups
Land capability classification (irrigated): 2w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R015XC025CA - CLAYEY BOTTOMLAND
Hydric soil rating: Yes

Description of Cole

Setting
Landform: Basin floors, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread
Down-slope shape: Linear, concave
Across-slope shape: Linear
Parent material: Alluvium derived from shale, sandstone, or granite

Typical profile
H1 - 0 to 5 inches: clay loam
H2 - 5 to 14 inches: silty clay loam
H3 - 14 to 60 inches: silty clay

Properties and qualities
Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.1 inches)

Interpretive groups
Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C/D
Ecological site: R015XC025CA - CLAYEY BOTTOMLAND
Hydric soil rating: Yes

Minor Components

Unnamed, slopes less than 2 percent
Percent of map unit: 10 percent
Hydric soil rating: No

Clear lake

Percent of map unit: 10 percent
Landform: Depressions
Landform position (two-dimensional): Backslope
Hydric soil rating: Yes

Cortina

Percent of map unit: 10 percent
Hydric soil rating: No

127—Fluvents, channeled

Map Unit Setting

National map unit symbol: hf1z
Elevation: 100 to 1,500 feet
Mean annual precipitation: 33 to 42 inches
Mean annual air temperature: 55 to 57 degrees F
Frost-free period: 310 to 365 days
Farmland classification: Not prime farmland

Map Unit Composition

Fluvents and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fluvents

Setting

Landform: Flood plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

- 0 to 60 inches: stratified cobbly sand to silt loam

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Runoff class: Low
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): 8w
Land capability classification (nonirrigated): 8w
Hydric soil rating: Yes

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Appendix C:
Datasheets

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 1

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): swale | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.063141 | Long: -122.811560 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent slopes | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (•)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )	
Hydric Soil Present?	Yes (•)	No ( )	**Is the Sampled Area within a Wetland?** Yes (•) No ( )
Wetland Hydrology Present?	Yes (•)	No ( )	

Remarks: This sampling point was taken within a swale that held standing water to the west but at this location contained >5% vegetation. The sampling point is south of Sir Francis Drake Boulevard. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	85	Yes	FACW
2.			
3.			
4.			
Total Cover:	85 %		
Sapling/Shrub Stratum			
1. *Rubus ursinus*	20	Yes	FAC
2. *Lonicera involucrata var. ledebourii*	5	Yes	FAC
3.			
4.			
5.			
Total Cover:	25 %		
Herb Stratum			
1. *Oenanthe sarmentosa*	20	Yes	OBL
2. *Anthyrium filix-femina var. cyclosorum*	15	Yes	FAC
3. *Holcus lanatus*	5	No	FAC
4. *Persicaria punctata*	5	No	OBL
5.			
6.			
7.			
8.			
Total Cover:	45 %		
Woody Vine Stratum			
1. *Hedera helix*	5	Yes	Not Listed
2. *Toxicodendron diversilobum*	5	Yes	Not Listed
Total Cover:	10 %		

% Bare Ground in Herb Stratum 30 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 71.4 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species	25	x 1 =	25	
FACW species	85	x 2 =	170	
FAC species	45	x 3 =	135	
FACU species		x 4 =	0	
UPL species	10	x 5 =	50	
Column Totals:	165	(A)	380	(B)

Prevalence Index = B/A = 2.30

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks: There was 30% of mud/bare ground.

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
16	10YR 3/2	70	7.5YR 4/6	30	C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 2

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): swale | Local relief (concave, convex, none): concave | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.063259 | Long: -122.811120 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent slopes | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: The sampling point is south of Sir Francis Drake Boulevard. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	90	Yes	FACW
2.			
3.			
4.			
Total Cover:	90 %		
Sapling/Shrub Stratum			
1. *Rubus ursinus*	30	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	30 %		
Herb Stratum			
1. *Oenanthe sarmentosa*	40	Yes	OBL
2. *Anthyrium filix-femina var. cyclosorum*	5	Yes	FAC
3. *Persicaria punctata*	5	No	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover:	50 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	45	x 1 =	45
FACW species	90	x 2 =	180
FAC species	35	x 3 =	105
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	170 (A)		330 (B)

Prevalence Index = B/A = 1.94

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: There was 20% of mud/bare ground.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
16	7.5YR 3/2	60	7.5YR 4/6	40	C	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☒ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☒ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 3

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.063516 | Long: -122.810839 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent slopes | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [X] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: The sample was taken south of Sir Francis Drake Boulevard. The sample point was taken on the top of a hillslope. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California. This soil sample point appears modified by road fill.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	100	Yes	FACW
2.			
3.			
4.			
Total Cover:	100%		
Sapling/Shrub Stratum			
1. *Lonicera involucrata var. ledebourii*	80	Yes	FAC
2. *Rubus ursinus*	10	No	FAC
3.			
4.			
5.			
Total Cover:	90 %		
Herb Stratum			
1. *Toxicodendron diversilobum*	10	Yes	Not Listed
2. *Urtica dioica*	5	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	15 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 10 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	100	x 2 =	200
FAC species	95	x 3 =	285
FACU species		x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	205 (A)		535 (B)

Prevalence Index = B/A = 2.61

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
10	10YR 2/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rocky

Depth (inches): 10

Hydric Soil Present? Yes ○ No ●

Remarks: The sampling point was taken on a raised berm or hill, which may contain fill.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 4

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.063577 | Long: -122.810878 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: The sample point was taken within a roadside ditch approximately 25 feet north of Sampling Point 3 and south of Sir Francis Drake Boulevard. The plot size was 3 feet x 3 feet. This year, 2015, is the fourth year of a drought in California.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	50	Yes	FACW
2. *Fraxinus latifolia*	50	Yes	FACW
3.			
4.			
Total Cover:	100%		
Sapling/Shrub Stratum			
1. *Lonicera involucrata var. ledebourii*	20	Yes	FAC
2. *Ribes divaricatum var. pubiflorum*	10	No	FAC
3.			
4.			
5.			
Total Cover:	30 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 70 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	100	x 2 =	200
FAC species	30	x 3 =	90
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	130 (A)		290 (B)

Prevalence Index = B/A = 2.23

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

The ditch had no herbaceous layer, only fallen leaves and duff. The tree and shrub layer were overhanging the ditch and not growing from the ditch.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
18	10YR 2/2	50	7.5YR 5/6	50	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 5

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): flood plain terrace | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.064113 | Long: -122.809799 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent | NWI classification: PFOC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area**
Wetland Hydrology Present?	Yes (●)	No ( )	**within a Wetland?** Yes (●) No ( )

Remarks: The sample point was taken approximately 65 feet south of the edge of pavement, down a slope. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California. This is considered a wetland due to proximity to Olema Creek and its floodplain and the area exhibits hydrophytic vegetation and wetland hydrology.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	80	Yes	FACW
2.			
3.			
4.			
Total Cover:	80 %		
Sapling/Shrub Stratum			
1. *Lonicera involucrata var. ledebourii*	80	Yes	FAC
2. *Rubus ursinus*	20	No	FAC
3.			
4.			
5.			
Total Cover:	100 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:		
OBL species		x 1 =	0	
FACW species	80	x 2 =	160	
FAC species	100	x 3 =	300	
FACU species		x 4 =	0	
UPL species		x 5 =	0	
Column Totals:	180 (A)		460	(B)

Prevalence Index = B/A = 2.56

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

The sampling area had no herbaceous layer, only fallen leaves and duff.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
16	10YR 3/3	100					silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 6

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): flood plain terrace | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.063522 | Long: -122.811475 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent slope | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area**
Wetland Hydrology Present?	Yes (●)	No ( )	**within a Wetland?** Yes ( ) No (●)

Remarks: The sample was taken north of Sir Francis Drake Boulevard. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California. This soil sample point was taken in 2015 was within the BSA. As of 2020, this soil sample point is just outside the BSA.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	60	Yes	FACW
2. *Salix lasiolepis*	40	Yes	FACW
3.			
4.			
Total Cover:	100%		
Sapling/Shrub Stratum			
1. *Rubus ursinus*	5	Yes	FAC
2. *Ribes divaricatum var. pubiflorum*	3	Yes	FAC
3. *Toxicodendron diversilobum*	2	Yes	Not Listed
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	100	x 2 =	200
FAC species	8	x 3 =	24
FACU species		x 4 =	0
UPL species	2	x 5 =	10
Column Totals:	110 (A)		234 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

The sampling area had no herbaceous layer, only fallen leaves and duff. The tree and shrub layer were overhanging the sampling area.

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
16	10YR 3/3	100					silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 7

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): flood plain terrace | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.063870 | Long: -122.810871 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: The sample was taken north of Sir Francis Drake Boulevard. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California. This soil sample point was taken in 2015 and was within the BSA. As of 2020, this soil sample point is just outside the BSA.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix lasiolepis*	100	Yes	FACW
2.			
3.			
4.			
Total Cover:	100%		
Sapling/Shrub Stratum			
1. *Rubus ursinus*	20	Yes	FAC
2. *Dispsacus fullonum*	20	Yes	FAC
3. *Ribes divaricatum var. pubiflorum*	10	Yes	FAC
4.			
5.			
Total Cover:	50 %		
Herb Stratum			
1. *Cyperus eragrostis*	5	Yes	FACW
2. *Disacus fullonum*	3	Yes	FAC
3. *Oenanthe sarmentosa*	2	No	OBL
4.			
5.			
6.			
7.			
8.			
Total Cover:	10 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 75 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	105	x 2 =	210
FAC species	53	x 3 =	159
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	160 (A)		371 (B)

Prevalence Index = B/A = 2.32

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: The sampling area had a very low herbaceous layer cover, mostly fallen leaves and duff. The tree and shrub layer were overhanging the sampling area.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
16	10YR 3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge | City/County: Pt. Reyes/Marin | Sampling Date: 7/22/15

Applicant/Owner: County of Marin | State: CA | Sampling Point: 8

Investigator(s): Constance Ganong/Rebecca Doubledee | Section, Township, Range: Sections 35-36, T3N, R9W

Landform (hillslope, terrace, etc.): river plain | Local relief (concave, convex, none): none | Slope (%): 0

Subregion (LRR): C - Mediterranean California | Lat: 38.064419 | Long: -122.808389 | Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent slopes | NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area**
Wetland Hydrology Present?	Yes (●)	No ( )	**within a Wetland?** Yes ( ) No (●)

Remarks: The sample was taken south of Sir Francis Drake Boulevard. The plot size was 10 feet x 10 feet. This year, 2015, is the fourth year of a drought in California.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	100	Yes	FACW
2.			
3.			
4.			
Total Cover:	100%		
Sapling/Shrub Stratum			
1. *Rubus ursinus*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1. *Disacus fullonum*	5	Yes	FAC
2. *Euphorbia peplus*	5	Yes	Not Listed
3. *Unknown ornamental lily*	5		Not Listed
4.			
5.			
6.			
7.			
8.			
Total Cover:	15 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 75 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	100	x 2 =	200
FAC species	15	x 3 =	45
FACU species		x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	125 (A)		295 (B)

Prevalence Index = B/A = 2.36

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: The sampling area had a very low herbaceous layer cover, mostly fallen leaves and duff. The tree and shrub layer were overhanging the sampling area.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
16	10YR 3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☒ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge City/County: Pt. Reyes Station/Marin Sampling Date: 11/6/20

Applicant/Owner: County of Marin State: CA Sampling Point: W9

Investigator(s): Constance Ganong Section, Township, Range: Sections 36-36, T3N, R9W

Landform (hillslope, terrace, etc.): river plain Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 38.064460 Long: -122.808500 Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

The soil sample point was taken south of Sir Francis Drake Blvd. This area of the BSA within NPS property is very dense with California blackberry and stinging nettle. The area was chosen for accessibility.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5'x5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer negundo	80	Y	FACW
2.			
3.			
4.			
	80 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5'x5')			
1. Rubus ursinus	25	Y	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1. Carex obnupta	25	Y	OBL
2. Hedera helix	10	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	35 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

The sampling area had a very low herbaceous layer cover, mostly fallen leaves and duff. The tree and shrub layer were overhanging the sampling area.

SOIL

Sampling Point: W9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge City/County: Pt. Reyes Station/Marin Sampling Date: 11/6/20

Applicant/Owner: County of Marin State: CA Sampling Point: W10

Investigator(s): Constance Ganong Section, Township, Range: Sections 36-36, T3N, R9W

Landform (hillslope, terrace, etc.): river plain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 38.064402 Long: -122.809122 Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

The soil sample point was taken south of Sir Francis Drake Blvd. The vegetation in this area between box elder and arroyo willow mostly herbaceous with no trees.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5'x5')			
1. Rubus ursinus	35	Y	FAC
2.			
3.			
4.			
5.			
	35 = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1. Conium maculatum	40	Y	FAC
2. Dipsacus fullonum	20	Y	FAC
3. Hirschfeldia incana	5	N	NL
4.			
5.			
6.			
7.			
8.			
	65 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

The vegetation in this area is predominately poison hemlock and teasel.

SOIL

Sampling Point: W10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge City/County: Pt. Reyes Station/Marin Sampling Date: 11/6/20

Applicant/Owner: County of Marin State: CA Sampling Point: W11

Investigator(s): Constance Ganong Section, Township, Range: Sections 36-36, T3N, R9W

Landform (hillslope, terrace, etc.): river plain Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 38.064294 Long: -122.809512 Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

The soil sample point was taken south of Sir Francis Drake Blvd. This area of the BSA within NPS property is very dense with California blackberry and stinging nettle. The area was chosen for accessibility.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5'x5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	90	Y	FACW
2.			
3.			
4.			
	90 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5'x5')			
1. Rubus ursinus	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 5'x5')			
1. Lonicera involucrata var. ledebourii	2	Y	FAC
2.			
	2 = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

The sampling area had a very low herbaceous layer cover, mostly fallen leaves and duff. The tree, shrub, and vine layer were overhanging the sampling area.

SOIL

Sampling Point: W11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
10	10YR 3/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: root system

Depth (inches): 10

Hydric Soil Present? Yes _____ No ✓

Remarks:

The restrictive layer was willow roots

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Sir Francis Drake Blvd. Bridge City/County: Pt. Reyes Station/Marin Sampling Date: 11/6/20

Applicant/Owner: County of Marin State: CA Sampling Point: W12

Investigator(s): Constance Ganong Section, Township, Range: Sections 36-36, T3N, R9W

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR): C - Mediterranean California Lat: 38.063303 Long: -122.811012 Datum: WGS 84

Soil Map Unit Name: Blucher-Cole Complex 2 to 5 percent NWI classification: not classified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

The soil sample point was taken south of Sir Francis Drake Blvd in an expanded section of the new BSA.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5'x5')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	80	Y	FACW
2.			
3.			
4.			
	80 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5'x5')			
1. Rubus ursinus	5	Y	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5'x5')			
1. Urtica dioica	2	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	2 = Total Cover		
Woody Vine Stratum (Plot size: 5'x5')			
1. Lonicera involucrata var. ledebourii	5	Y	FAC
2.			
	5 = Total Cover		

% Bare Ground in Herb Stratum 93 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

The sampling area had a very low herbaceous layer cover, mostly fallen leaves and duff. The tree and vine layer were overhanging the sampling area.

SOIL

Sampling Point: W12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16	10YR 3/2	95	7.5YR 4/6	5			silty loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ✓ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D:
Photographs of Study Areas



Photo 1. Olema Creek south of the bridge. Photo taken facing southeast. Photo taken July 22, 2015.



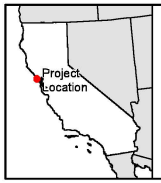
Photo 2. Adjacent waters south of Sir Francis Drake Blvd, which extends east within the BSA. Photo taken facing north. Photo taken July 22, 2015.



Photo 3. Representative photo of adjacent wetlands with arroyo willow thicket. Photo taken at Sample Point 1. Photo taken July 22, 2015.

Appendix E:
California Coastal Commission Wetland Map





USGS 7.5' Quad:
Inverness (1976)

Legal Description:
T3N, R9W Sections 35, 36

Delineation by Constance Ganong and Rebecca Doubledee
on July 22, August 20 and September 9, 2015
and Constance Ganong on November 6, 2020.
Date of Map: 11/24/20

N

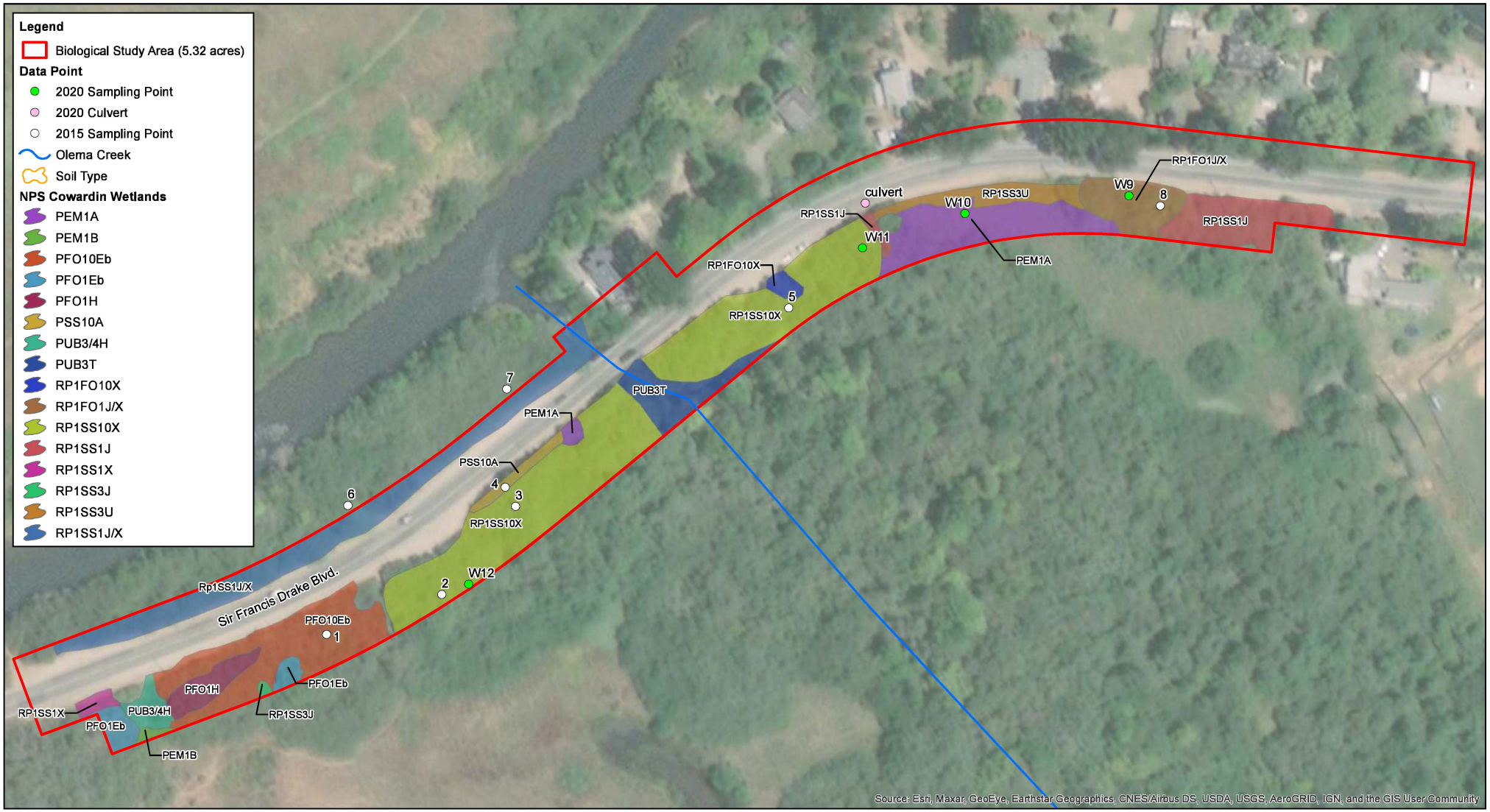
Scale 1:1,200
1 Inch = 100 Feet

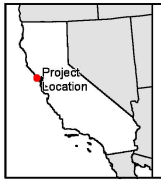
0 10 20
Meters

0 50 100
Feet

Appendix E:
California Coastal Commission Wetlands Map
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA

Appendix F:
National Park Service Cowardin Wetland Map





USGS 7.5' Quad:
Inverness (1976)

Legal Description:
T3N, R9W Sections 35, 36

Data Source: Parsons et. al. 2005.

Delineation by Constance Ganong and Rebecca Doubledee
on July 22, August 20 and September 9, 2015
and Constance Ganong on November 6, 2020.
Date of Map: 11/24/20

N

Scale 1:1,200
1 Inch = 100 Feet

0 10 20
Meters

0 50 100
Feet

Appendix F:
National Park Service
Cowardin Wetland Map
Sir Francis Drake Blvd.
Bridge Replacement Over
Olema Creek
Marin County, CA

Wetlands and Riparian Classification[1] for Appendix F

Abbreviation	Classification
PEM1A	Palustrine, Emergent, Persistent, Temporarily Flooded
PEM1B	Palustrine, Emergent, Persistent, Saturated
PFO10Eb	Palustrine, Forested, Deciduous and Evergreen, Seasonally Flooded/Seasonally Saturated
PFO1Eb	Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Seasonally Saturated
PSS10A	Palustrine, Scrub-Shrub, Deciduous and Evergreen, Temporarily Flooded
PUB3/4H	Palustrine, Unconsolidated Bottom, Mud, Organic, Permanently Flooded
PUB3T	Palustrine, Unconsolidated Bottom, Mud, Semipermanently Flooded-Tidal
RP1FO10X	Riparian, Lotic, Forested, Deciduous and Evergreen, Phreatophytic
RP1FO1J/X	Riparian, Lotic, Forested, Broad-Leaved Deciduous, Intermittently Flooded/Phreatophytic
RP1SS10X	Riparian, Lotic, Scrub-Shrub, Deciduous and Evergreen, Phreatophytic
RP1SS1J	Riparian, Lotic, Scrub-Shrub, Broad-Leaved Deciduous, Intermittently Flooded
RP1SS1X	Riparian, Lotic, Scrub-Shrub, Broad-Leaved Deciduous, Phreatophytic
RP1SS3J	Riparian, Lotic, Scrub-Shrub, Broad-Leaved Evergreen, Intermittently Flooded
RP1SS3U	Riparian, Lotic, Scrub-Shrub, Broad-Leaved Evergreen, Upland
RP1SS1J/X	Riparian, Lotic, Scrub-Shrub, Broad-Leaved Deciduous, Intermittently Flooded/Phreatophytic

[1] (Cowardin *et al.* 1979) and (USFWS 1997)

Appendix G:
Aquatic Resource Spreadsheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Historic Waters 1 (HW-1)	CALIFORNIA	R1UB	RIVERINE	Area	0.33	ACRE	TNW	38.06346	-122.811532	
Other Waters 1 (W-1)	CALIFORNIA	R1UB	RIVERINE	Area	0.25	ACRE	TNW	38.063919	-122.81044	
Adjacent Waters 1 (AWA-1)	CALIFORNIA	R1UB	RIVERINE	Area	0.15	ACRE	TNWRPW	38.062935	-122.812223	
Adjacent Wetlands 1 (AWE-1)	CALIFORNIA	RP1SS8	RIVERINE	Area	0.19	ACRE	TNWW	38.063141	-122.81156	
Adjacent Wetlands 2 (AWE-2)	CALIFORNIA	RP1SS8	RIVERINE	Area	0.26	ACRE	TNWW	38.063259	-122.81112	
Adjacent Wetlands 3 (AWE-3)	CALIFORNIA	RP1SS8	RIVERINE	Area	0.17	ACRE	TNWW	38.064113	-122.809799	

BRLS-5927 (099) Sir Francis Olema Final NES

Final Audit Report 2024-11-14

Created:	2024-11-14
By:	Keevan Harding (s147645@dot.ca.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAAz2jNbAw_BjCWQUdywhYdshq7ozbbLIN4

"BRLS-5927 (099) Sir Francis Olema Final NES" History

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APPENDIX B

Policy Consistency Analysis

POLICY CONSISTENCY

This Appendix provides policy consistency statements for the project, which is being carried out by the Marin County Department of Public Works. Because the County is the lead implementing agency, the project is not subject to discretionary land-use permitting under the County's policy and zoning programs; rather, it is a publicly managed infrastructure improvement project, executed by the County in accordance with its responsibilities under the Marin County governance structure. Notwithstanding, the project was designed to align with the County's broader regional and community planning framework, which guides sustainability, infrastructure, and environmental stewardship in unincorporated Marin County.

Policy	Project Consistency
Marin Countywide Plan	
Biological Resources	
Policy BIO-1.3: Protect Woodlands, Forests, and Tree Removal. The County shall strive to protect large trees, trees with historical importance, and oak woodland habitat, and prevent the untimely removal of trees through implementation of tree preservation ordinance.	**Consistent.** As discussed in **Section 4, Biological Resources**, the County will provide tree replacement in accordance with permit requirements from resource agencies for potential tree removal and loss within the project site.
Policy BIO-2.1: Include Resource Preservation in Environmental Review. Require environmental review pursuant to CEQA of development applications to assess the impact of proposed development on native species and habitat diversity, particularly special-status species, sensitive natural communities, wetlands, and important wildlife nursery areas and movement corridors. Require adequate mitigation measures for ensuring the protection of any sensitive resources and achieving "no net loss" of sensitive habitat acreage, values, and function.	**Consistent.** As discussed in **Section 4, Biological Resources**, the Natural Environment Study (NES) prepared for the project evaluated potential effects to biological and aquatic resources and developed design elements and Avoidance and Minimization Measures to reduce impacts.
Policy BIO-2.4: Protect Wildlife Nursery Areas and Movement Corridors. Ensure that important corridors for wildlife movement and dispersal are protected as a condition of discretionary permits, including consideration of cumulative impacts. Features of particular importance to wildlife for movement may include riparian corridors, shorelines of the coast and bay, and ridgelines. Linkages and corridors shall be provided	**Consistent.** As discussed in **Section 4, Biological Resources**, Olema Creek serves as a pathway for migratory fish species. design elements and Avoidance and Minimization Measures would be applied to ensure that project construction would not permanently block migration pathways.

Policy	Project Consistency
that connect sensitive habitat areas such as woodlands, forests, wetlands, and essential habitat for special-status species, including an assessment of cumulative impacts.	
Policy BIO-2.5: Restrict Disturbance in Sensitive Habitat During Nesting Season. Limit construction and other sources of potential disturbance in sensitive riparian corridors, wetlands, and baylands to protect bird nesting activities. Disturbance should generally be set back from sensitive habitat during the nesting season from March 1 through August 1 to protect bird nesting, rearing, and fledging activities. Preconstruction surveys should be conducted by a qualified professional where development is proposed in sensitive habitat areas during the nesting season, and appropriate restrictions should be defined to protect nests in active use and ensure that any young have fledged before construction proceeds.	**Consistent.** As discussed in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to protect nesting birds, such as adherence to work windows, preconstruction surveys, non-disturbance buffers, and biological monitoring.
Policy BIO-2.6: Identify Opportunities for Safe Wildlife Movement. Ensure that existing stream channels and riparian corridors continue to provide for wildlife movement at roadway crossings, preferably through the use of bridges, or through over-sized culverts, while maintaining or restoring a natural channel bottom. Consider the need for wildlife movement in designing and expanding major roadways and other barriers in the county.	**Consistent.** As discussed in **Section 4, Biological Resources**, the project would not permanently impede wildlife movement. Implementation of design elements and Avoidance and Minimization Measures would minimize temporary project effects to wildlife movement during construction.
Policy BIO-2.9: Promote Early Consultation with Other Agencies. Require applicants to consult with all agencies with review authority for projects in areas supporting wetlands and special-status species at the outset of project planning.	**Consistent.** As discussed in **Section 4, Biological Resources,** the FHWA is pursuing consultation with USFWS, CDFW, and NMFS to support the preservation of federally-protected special-status species.
Policy BIO-4.1: Restrict Land Use in Stream Conservation Areas (SCA). A SCA is established to protect the active channel, water quality and flood control functions, and associated fish and wildlife habitat values	**Consistent.** For parcels more than 2 acres in area, the SCA limit is a minimum 100-foot setback from the top of the stream banks. The project site is within a SCA which is defined as a setback from the

Policy	Project Consistency
along streams. Development shall be set back to protect the stream and provide an upland buffer, which is important to protect significant resources that may be present and provides a transitional protection zone. Best management practices shall be adhered to in all designated SCAs. Best management practices are also strongly encouraged in ephemeral streams not defined as SCAs.	bank of a natural watercourse intended to protect the active channel, water quality, and flood control functions and associated fish and wildlife habitat values along streams. As a bridge replacement, the project does not encourage new land uses or development within this SCA that would impact significant resources.
Policy BIO-4.2: Comply with SCA Regulations. Implement established setback criteria for protection of SCAs through established discretionary permit review processes and/or through adoption of new ordinances. Environmental review shall be required where incursion into an SCA is proposed and a discretionary permit is required. In determining whether allowable uses are compatible with SCA regulations, development applications shall not be permitted if the project does any of the following: • Adversely alters hydraulic capacity • Causes a net loss in habitat • Degrades water quality	**Consistent.** As described in **Section 4, Biological Resources,** and **Section 10, Hydrology and Water Quality**, the project would not alter hydraulic capacity or degrade water quality, and would implement design elements and Avoidance and Minimization Measures to minimize habitat impacts.
Policy BIO-4.4: Promote Natural Stream Channel Function. Retain and, where possible, restore the hydraulic capacity and natural functions of stream channels in SCAs. Discourage alteration of the bed or banks of the stream, including filling, grading, excavating, and installation of storm drains and culverts. When feasible, replace impervious surfaces with pervious surfaces. Protect and enhance fish habitat, including through retention of large woody debris, except in cases where removal is essential to protect against property damage or prevent safety hazards. In no case shall alterations that create barriers to fish migration be allowed on streams mapped as historically supporting salmonids. Alteration of natural channels within SCAs for flood control should be designed and constructed in a manner that retains and protects the riparian vegetation, allows for sufficient capacity and natural channel migration, and allows for	**Consistent.** As described in **Section 4, Biological Resources**, and **Section 10, Hydrology and Water Quality**, the project would implement design elements and Avoidance and Minimization Measures to promote natural stream channel function. Such measures include implementation of BMPs to protect and enhance fish habitat and restoration to retain and protect riparian vegetation.

Policy	Project Consistency
reestablishment of woody trees and shrubs without compromising the flood flow capacity where avoidance of existing riparian vegetation is not possible.	
Policy BIO-4.6: Control Exotic Vegetation. Remove and replace invasive exotic plants with native plants as part of stream restoration projects and as a condition of site-specific development approval in an SCA, and include monitoring to prevent reestablishment.	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to control invasive plants within the project site and ensure restoration and revegetation.
Policy BIO-4.7 Protect Riparian Vegetation. Retain riparian vegetation for stabilization of streambanks and floodplains, moderating water temperatures, trapping and filtering sediments and other water pollutants, providing wildlife habitat, and aesthetic reasons.	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to minimize effects to riparian vegetation.
Policy BIO-4.14: Reduce Road Impacts in SCAs. Locate new roads and roadfill slopes outside SCAs, except at stream crossings, and consolidate new road crossings wherever possible to minimize disturbance in the SCA. Require spoil from road construction to be deposited outside the SCA, and take special care to stabilize soil surfaces.	**Consistent.** As a bridge replacement, the project does not include new roadways within the SCA.
Water Resources	
Policy WR-1.3: Improve Infiltration. Enhance water infiltration throughout watersheds to decrease accelerated runoff rates and enhance groundwater recharge. Whenever possible, maintain or increase a site's predevelopment infiltration to reduce downstream erosion and flooding.	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would add new impervious surfaces, but these areas would not substantially affect runoff rates in a manner that would disrupt water infiltration, erosion, or flooding.
Policy WR-2.3: Avoid Erosion and Sedimentation. Minimize soil erosion and discharge of sediments into surface runoff, drainage systems, and water bodies. Continue to require grading plans that address avoidance of soil erosion and on-site sediment retention. Require developments to include on-site facilities for the retention of sediments,	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would implement design elements and BMPs to ensure erosion control.

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and, if necessary, require continued monitoring and maintenance of these facilities upon project completion.	
Policy WR-2.4 Design County Facilities to Minimize Pollutant Input. Design, construct, and maintain County buildings, landscaped areas, roads, bridges, drainages, and other facilities to minimize the volume of toxics, nutrients, sediment, and other pollutants in stormwater flows, and continue to improve road maintenance methods to reduce erosion and sedimentation potential.	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would implement design elements and BMPs to minimize polluted stormwater discharge.
Environmental Hazards	
Policy EH-2.1: Avoid Hazard Areas. Require development to avoid or minimize potential hazards from earthquakes and unstable ground surfaces.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity**, the project would incorporate design features to minimize potential hazards from strong seismic ground shaking and unstable ground surfaces.
Agriculture and Food	
Policy AG-1.4: Limit Non-Agricultural Zoning. Apply non-agricultural zoning only in areas where conflict with agricultural uses will be minimized, and ensure that development standards preserve and enhance nearby agricultural uses.	**Consistent.** The project does not propose changes that would conflict with agricultural zoning.
Policy AG-1.6: Limit Non-Agricultural Development. Limit non-agricultural development in the Agricultural Production Zone to residential and accessory uses that are ancillary to and compatible with agricultural production. Require dwellings and other non-agricultural development to be limited in size and grouped together in building envelopes covering no more than 5 percent of the property or as determined through a site-specific analysis of agricultural and environmental constraints and resources, with the remainder preserved for agricultural production.	**Consistent.** See above. Additionally, the project does not propose dwellings or other buildings on the site.

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Residential and non-agricultural development on very large parcels may be limited to less than 5 percent of the land area.	
Policy AG-1.10: Protect Productive Agricultural Soils: Discourage or prohibit non-agricultural buildings, impermeable surfaces, or other non-agricultural uses on soils classified by the Natural Resources Conservation Service (NRCS) as Prime Farmland soils or Farmland soils of Statewide Importance.	**Consistent.** See above. The project does not propose dwellings or other buildings on the site, nor does it propose any land use changes.
Community Design	
Policy DES-1.2: Protect Rural Character. Ensure that development in rural areas is consistent with local design and scale and does not detract from the open character of the landscape.	**Consistent.** As described in **Section 1, Aesthetics**, the project would conform to the existing visual landscape and quality.
Policy DES-4.1: Preserve Visual Quality. Protect scenic quality and views of the natural environment — including ridgelines and upland greenbelts, hillsides, water, and trees — from adverse impacts related to development.	**Consistent.** As described in **Section 1, Aesthetics**, the project would conform to the existing visual landscape and quality.
Transportation	
Policy TR-1.6: Keep Rural Character in West Marin. Maintain roads in West Marin as two-lane routes, with the possible additions of bicycle lanes, turn lanes at intersections, and turnouts for slow-moving traffic.	**Consistent.** The project would not expand existing roadway capacity.
Policy TR-4.2: Recycle and Conserve Energy. Include recycled and energy-conserving materials for road construction and repair, where feasible.	**Consistent.** As described in **Section 8, Greenhouse Gas Emissions**, the project would incorporate BMPs during construction, such as using alternative fuel (e.g., biodiesel, electric) vehicles/equipment for at least 15 percent of the fleet; using at least

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	10 percent local building materials; and recycling or reusing at least 50 percent of construction waste or demolition materials
Noise	
Policy NO-1.3: Regulate Noise Generating Activities. Require measures to minimize noise exposure to neighboring properties, open space, and wildlife habitat from construction-related activities, yard maintenance equipment, and other noise sources, such as amplified music.	**Consistent**. As described in **Section 13, Noise**, the project would implement BMPs and would minimize construction-related noise.
Public Safety	
Policy PS-3.2: Safe Public Structures. Protect public health and safety through appropriate siting and rehabilitation of public facilities.	**Consistent.** The project consists of rehabilitating a functionally obsolete bridge over Olema Creek.
Policy PS-4.1: Regulate and Reduce Hazardous Material Use. Control the use and storage of hazardous materials to minimize their presence in, and potential dangers to, the community and environment.	**Consistent.** As described in **Section 9, Hazards and Hazardous Materials**, the project would implement standard procedures and BMPs to minimize dangers associated with hazardous materials. Such practices include site housekeeping practices, storage, inspections, worker training in pollution prevention measures, and containment of releases to prevent runoff via stormwater.
Historical and Archaeological Resources	
Policy HAR-1.1 Preserve Historical Resources. Identify archaeological and historical resource sites.	**Consistent.** As described in **Section 5, Cultural Resources**, the project's environmental review process included a cultural resource investigation to identify archaeological and historical resources within the project site.

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Policy HAR-1.3 Avoid Impacts to Historical Resources. Ensure that human activity avoids damaging cultural resources.	**Consistent.** As described in **Section 5, Cultural Resources**, the project would minimize impacts to cultural resources.
Point Reyes Station Community Plan	
Planning Area Description and Land Uses	
Policy PA-3.8 Rural Improvement Standards. Improvements such as roads, driveways, parking areas and residential and commercial lighting should be compatible with the rural environment.	**Consistent.** As described in **Section 11, Land Use and Planning,** the project would be replacing an existing bridge and will adhere to the Point Reyes Station Community Policies to ensure compatibility with the rural environment.
Natural Resource Protection	
Policy NR-3.1 Endorse County Policies. The Community Plan endorses the stream and streamside conservation policies of Local Coastal Program (Unit 2) and the Countywide Plan.	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would implement design elements and adhere to Caltrans BMPs to minimize impacts to water resources within the project site.
Policy NR 3.2 Streamside Conservation Areas. Stream buffers to protect streams and streamside environments from the impacts of adjacent uses shall be established for each stream in the Planning Area.	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would implement design elements and adhere to Caltrans BMPs to minimize impacts to water resources within the project site.
Marin County Local Coastal Program	
C-BIO-2 Environmentally Sensitive Habitat Area (ESHA) Protection. 1. Protect ESHAs against disruption of habitat values, and only allow uses within those areas that are dependent on those resources or otherwise specifically provided in C-BIO-14 (Wetlands), C-BIO-15 (Diking, Filling, Draining and Dredging) or C-BIO-23 (Coastal Streams and Riparian	**Consistent**. As described in **Section 4, Biological Resources**, the Natural Environment Study (NES) prepared for the project evaluated potential effects to biological and aquatic resources and developed design elements and Avoidance and Minimization measures to reduce impacts.

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Vegetation). Disruption of habitat values includes when the physical habitat is significantly altered or when species diversity or the abundance or viability of species populations is reduced. The type of proposed development, the particulars of its design, and its location in relation to the habitat area, will affect the determination of disruption. 2. Accessways and trails that are fundamentally associated with the interpretation of the resource are resource dependent uses that shall be sited and designed to protect ESHAs against significant disruption of habitat values in accordance with Policy C-BIO-2.1. Where it is not feasible to avoid ESHA, the design and development of accessways and trails shall minimize intrusions to the smallest feasible area and least impacting routes. As necessary to protect ESHAs, trails shall incorporate measures to control the timing, intensity or location of access (e.g., seasonal closures, placement of boardwalks, limited fencing, etc.). 3. Avoid fence types, roads, and structures that significantly inhibit wildlife movement, especially access to water. 4. Development proposals within or adjacent to ESHA will be reviewed subject to a biological site assessment prepared by a qualified biologist hired by the County and paid for by the applicant. The purpose of the biological site assessment is to confirm the extent of the ESHA, document any site constraints and the presence of other sensitive biological resources, recommend buffers, development timing, mitigation measures including precise required setbacks, provide a site restoration program where necessary, and provide other information, analysis and modifications appropriate to protect the resource.	
C-BIO-3 ESHA Buffers. 1. In areas adjacent to ESHAs and parks and recreation areas, site and design development to prevent impacts that would significantly degrade those areas, and to be compatible with the continued viability of those habitat and recreation areas.	**Consistent**. As discussed in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to protect nesting birds, such as preconstruction surveys, non-disturbance buffers, and biological monitoring.

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2. Provide buffers for wetlands, streams and riparian vegetation in accordance with C-BIO-18 and C-BIO23, respectively. 3. Establish buffers for terrestrial ESHA to provide separation from development impacts. Maintain such buffers in a natural condition, allowing only those uses that will not significantly degrade the habitat. Buffers for terrestrial ESHA shall be 50feet, a width that may be adjusted by the County as appropriate to protect the habitat value of the resource, but in no case shall be less than 25 feet. Such adjustment shall be made on the basis of a biological site assessment supported by evidence that includes but is not limited to: a. Sensitivity of the ESHA to disturbance; b. Habitat requirements of the ESHA, including the migratory patterns of affected species and tendency to return each season to the same nest site or breeding colony; c. Topography of the site; d. Movement of stormwater; e. Permeability of the soils and depth to water table; f. Vegetation present; g. Unique site conditions; h. Whether vegetative, natural topographic, or built features (e.g., roads, structures) provide a physical barrier between the proposed development and the ESHA; and i. The likelihood of increased human activity and disturbance resulting from the project relative to existing development	Additionally, as described in **Section 10, Hydrology and Water Quality**, the project would implement design elements and adhere to Caltrans BMPs to minimize impacts to water resources within the project site.
C-BIO-4 Protect Major Vegetation. Require a Coastal Permit for the removal or harvesting of major vegetation other than for agricultural purposes. Such major vegetation removal shall avoid ESHA, ESHA	**Consistent**. The project may require the removal of approximately 14 trees to facilitate embankment stabilization and construction access along Sir Francis Drake Blvd and the riparian areas of Olema and

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buffers, coastal waters, and public views, and shall not conflict with prior conditions of approval.	Lagunitas Creeks. Specifications regarding vegetation and tree replacement will be provided during the design phase of the project.
C-BIO-6 Invasive Plants. Where feasible, require the removal of non-native, invasive plant species such as pampas grass, brooms, iceplant, thistles and other invasive plant species on the list maintained by the California Invasive Plant Council in the areas of development and revegetate those areas with native plants as specified in Coastal Permit approvals. Ensure that required landscaping avoids use of non-native, invasive trees and plants in accordance with Policy C-DES-9 Landscaping. This policy does not apply to agricultural crops and pastures.	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to control invasive plants within the project site and ensure restoration and revegetation.
C-BIO-11 Development Adjacent to Roosting and Nesting Habitat. Development adjacent to wildlife nesting and roosting areas shall be set back a sufficient distance to protect against disruption in nesting and roosting activities and designed to avoid impacts on the habitat area. Time such development activities so that disturbance to nesting and breeding wildlife is avoided. To the extent feasible, use native vegetation for landscaping.	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to avoid and mitigate impacts to roosting and nesting habitat.
C-BIO-14 Wetlands. Preserve and maintain wetlands in the Coastal Zone as productive wildlife habitats and water filtering and storage areas, and protect wetlands against significant disruption of habitat values. Prohibit grazing or other agricultural uses in a wetland, except for ongoing agricultural activities.	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to avoid and mitigate impacts to wetlands and wildlife habitat.
C-BIO-15 Diking, Filling, Draining and Dredging. Diking, filling, draining and dredging of coastal waters can have significant adverse impacts on water quality, marine habitats and organisms, and scenic features. Limit strictly the diking, filling, and dredging of open coastal waters, wetlands, and estuaries to the following purposes:	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to avoid and mitigate impacts to wetlands and wildlife habitat.

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1. New or expanded commercial fishing facilities. 2. Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps. 3. Incidental public service purposes, including burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines. 4. Mineral extraction, including sand for restoring beaches, except in ESHAs. 5. Restoration purposes. 6. Nature study, aquaculture, or similar resource-dependent activities. 7. Excluding wetlands, new or expanded boating facilities and the placement of structural pilings for public recreation piers that provide public access and recreational opportunities may be permitted. 8. In the Esteros Americano and de San Antonio, limit any alterations to those for the purposes of scientific study and restoration.	The County proposes restoration of riparian woodland and wetland habitat to offset permanent effects from construction of the new bridge.
C-BIO-16 Conditions and Standards for Diking, Filling, Draining, and Dredging. Diking, filling, draining or dredging may be permitted for the purposes specified in policy C-BIO-15 above provided that all of the following conditions and standards are met: 1. There is no feasible less environmentally damaging alternative. 2. Mitigation measures have been provided in accordance with Policy C-BIO-20 (Wetland Impact Mitigation) in order to minimize adverse environmental effects. 3. The activities are planned, scheduled, and carried out to avoid significant disruption to marine and wildlife habitats, fish and bird breeding and migrations, and water circulation. 4. The need for both initial and maintenance dredging shall be minimized by careful design and location of facilities with respect to existing water	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to avoid and mitigate impacts to wetlands and wildlife habitat.

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depths, water circulation, siltation patterns, and by efforts to reduce controllable sedimentation. 5. In estuaries and wetlands, the diking, filling, or dredging shall maintain or enhance the functional capacity of the wetland or estuary.	
C-BIO-20 Wetland Impact Mitigation. Where any dike and fill development is permitted in wetlands in conformity with this section, require mitigation measures to include, at a minimum, either acquisition of required areas of equal or greater biological productivity or opening up equivalent areas to tidal action; provided, however, that if no appropriate restoration site is available, an in-lieu fee sufficient to provide an area of equivalent productive value or surface areas shall be dedicated to an appropriate public agency, or such replacement site shall be purchased before the dike or fill development may proceed. A minimum ratio of 2:1 in area is required for on-site mitigation, a minimum ratio of 3:1 is required for off-site mitigation, and a minimum ratio of 4:1 is required for an in-lieu fee. Mitigations shall meet the following criteria: 1. No net losses shall occur in wetland acreage, functions, or values. This includes both direct impacts on wetlands and essential buffers, and consideration of potential indirect effects of development due to changes in available surface water and nonpoint water quality degradation. Detailed review of the adequacy of a proposed mitigation plan shall be performed as part of any environmental and permit review of the proposed development project to allow for a thorough evaluation of the anticipated loss, as well as the replacement acreage, functions, and values. 2. Restoration of degraded wetlands is generally preferred to creation of new replacement wetlands, due to the greater likelihood of success. 3. Mitigation shall be implemented prior to and/or concurrently with the project activity causing the potential adverse impact to minimize any short-term loss and modification to wetlands. 4. An area of adjacent upland habitat shall be protected to provide an adequate buffer for wetland functions and values. Development shall be	**Consistent.** As described in **Section 4, Biological Resources**, the project would implement design elements and Avoidance and Minimization Measures to avoid and mitigate impacts to wetlands and wildlife habitat.

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set back the minimum distance specified in Policy C- BIO-18 (Wetland Buffers) to create this buffer, unless an adjustment is allowed and appropriate mitigation is provided where necessary, pursuant to Policy C-BIO-19 (Wetland Buffer Adjustments). 5. Mitigation sites shall be permanently protected and managed for open space and wildlife habitat purposes. 6. Mitigation projects must to the extent feasible minimize the need for ongoing maintenance and operational manipulation (e.g., dredging, artificial water-level controls, etc.) to ensure long-term success. Self-sustaining projects with minimal maintenance requirements constitute the primary objective and are encouraged. 7. All plans to mitigate or minimize adverse impacts to wetland environments shall include provisions to monitor the success of the restoration project. The measures taken to avoid adverse impacts may be modified if the original plans prove unsuccessful. Performance bonds shall be required for all mitigation plans involving habitat creation or enhancement, including the cost of monitoring for at least five years post-completion, or as long as necessary to ensure success criteria are achieved. 8. Mitigation must be commensurate with adverse impacts of the wetland alteration and consist of providing similar values and greater wetland acreage than those of the wetland area adversely affected. All restored or created wetlands shall be provided at least at the minimum replacement ratio specified in this Policy (C-BIO-20) and shall have the same or increased habitat values as the wetland proposed to be impacted. Such mitigation measures shall not be required for temporary or short-term fill or diking; provided that a bond or other evidence of financial responsibility is provided to assure that restoration will be accomplished in the shortest period of time not to exceed 12 months.	
C-BIO-23 Coastal Streams and Riparian Vegetation.	**Consistent**. As described in **Section 4, Biological Resources**, the project would require temporary diversion to complete replacement due

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1. Stream alterations. Limit channelizations, diversions, dams, or similar substantial alterations of coastal streams to the following purposes: a. Necessary water supply projects where no other less environmentally damaging method of water supply is feasible; b. Flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development; or c. Developments where the primary function is the improvement of fish and wildlife habitat. Before any such substantial alterations that would significantly disrupt the habitat value of a stream are permitted, minimum flows necessary to maintain fish habitat and water quality, and to protect downstream resources (e.g. riparian vegetation, groundwater recharge areas, receiving waters, spawning habitats, etc.) and downstream users shall be determined by the Department of Fish and Wildlife and the Division of Water Rights of the State Water Resources Control Board. Prohibit new impoundments which, individually or cumulatively, would decrease streamflows below the minimum. 2. Access and Utility Crossings. Access and utility crossings shall be accomplished by clear span bridging, unless other methods are determined to be less disruptive to the stream and/or riparian ESHA. Wherever possible, shared bridges or other crossings shall be used to provide access and utilities to groups of lots covered by this policy. Bridge abutments shall be located outside stream channels and designed to minimize disturbance of riparian vegetation. 3. Conditions. Minimize the alteration of streams allowed for the purposes listed in (1) and (2) above in order to protect streamwater quality and the volume and rate of streamflow. Require all developments to incorporate the best mitigation measures feasible, including erosion and runoff control measures, and re-vegetation of disturbed areas with native species. Minimize the disturbance of riparian vegetation and require revegetation.	to the bridge's existing status as functionally obsolete and poses safety issues. The implementation of the following Avoidance and Minimization Measure, discussed in **Section 4, Biological Resources**, would avoid and mitigate impacts due to the temporary diversion, erosion and revegetation; **AMM BIO-3: Water Diversion and Dewatering.**

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C-WR-1 Water Quality Protection and Biological Productivity. Monitor, protect, and enhance the quality of coastal waters for the benefit of natural communities, human health, recreational users, and the local economy. Maintain and, where feasible, restore the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health through means such as minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alterations of natural streams.	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would implement SWPPP which would control discharge and protect water quality from potential contaminants in stormwater runoff emanating from the construction site.
C-WR-2 Water Quality Impacts of Development Projects. Site and design development, including changes in use or intensity of use, to prevent, reduce, or remove pollutant discharges and to minimize increases in stormwater runoff volume and rate to prevent adverse impacts to coastal waters to the maximum extent practicable. All coastal permits, for both new development and modifications to existing development, and including those for developments covered by the current NPDES Phase II permit, shall be subject to this review. Where required by the nature and extent of a proposed project and where deemed appropriate by County staff, a project subject to this review shall have a plan which addresses both temporary (during construction) and permanent (post-construction) measures to control erosion and sedimentation, to reduce or prevent pollutants from entering storm drains, drainage systems and watercourses, and to minimize increases in stormwater runoff volume and rate. Permanent Best Management Practices (BMPs) that protect water quality and minimize increases in runoff volume and rate shall be incorporated in the project design of developments. Site design and source control measures shall be given high priority as the preferred means of controlling	**Consistent.** As described in **Section 10, Hydrology and Water Quality**, the project would implement SWPPP which would control discharge and protect water quality from potential contaminants in stormwater runoff emanating from the construction site.

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pollutant discharges and runoff volume and rate. Typical measures shall include: 1. Minimizing impervious area; 2. Limiting site disturbance; 3. Protecting areas that are particularly susceptible to erosion and sediment loss, ensuring that water runoff beyond pre-project levels is retained on site whenever possible, and using other Low Impact Development (LID) techniques; and 4. Methods that reduce potential pollutants at their sources and/or avoid entrainment of pollutants in runoff. Such methods include scheduling construction based on time of year, prohibiting erosion causing practices, and implementing maintenance and operational procedures. Examples include covering outdoor storage areas, using efficient irrigation, and minimizing the use of landscaping chemicals. **Program C-WR-2.a Apply Appropriate Best Management Practices to Coastal Permits.** The Community Development Agency shall conduct a review with the Department of Public Works to determine appropriate water quality design standards, performance criteria, and Best Management Practices (BMPs), which shall be incorporated in applicable coastal permits.	
C-WR-4 Grading and Vegetation Removal. Design development to fit a site's topography, soils, geology, hydrology, and any other existing conditions. Orient development so that grading, cut and fill operations, and other site preparation are kept to an absolute minimum. Natural features, landforms, and native vegetation shall be preserved to the maximum extent feasible. Areas of a site which are not suited to development because of known soil, geologic, flood, erosion or other hazards shall be kept undeveloped.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.

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C-WR-5 Cut and Fill Slopes. Design cut and fill slopes so that they are no steeper than is safe for the subject material or necessary for the intended use. A geotechnical report may be required.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.
C-WR-6 Soil Exposure. Allow any necessary grading operations only such that the smallest practicable area of land shall be exposed at any one time during development and the length of exposure shall be kept to the shortest practicable time. Erosion and sedimentation control measures shall be incorporated in development plans. An erosion and sedimentation control plan, subject to approval by the Department of Public Works, shall be required for development of any site of 1 acre or more in size or, at the discretion of the Department of Public Works, for any site of less than 1 acre because of a high risk of erosion and sedimentation. Such plan is also required for projects listed under Policy C-WR-14 that involve grading.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.
C-WR-7 Wintertime Clearing and Grading. Avoid land clearing and grading during the winter rainy season (i.e., October 15th through April 15th). Ensure that all measures for removing sediments and stabilizing slopes shall be in place before the beginning of the rainy season. Permit land clearing and grading during the rainy season only upon prior approval by the Department of Public Works of an erosion control plan, which shall demonstrate that at no stage of the work will there be any substantial risk of increased sediment discharge from the site.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.
C-WR-8 Disturbed Soils. Use temporary vegetation, seeding or hydroseeding with noninvasive native seeds, mulching, or other suitable stabilization methods to protect soils that have been exposed during	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific**

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grading or development. Stabilize cut and fill slopes immediately with plantings of native species, or with accepted landscaping practices.	**Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement Caltrans Standard and **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.
C-WR-9 Topsoil. Where topsoil is removed by grading operations, stockpile it for reuse and protect it from compaction and wind or erosion during stockpiling.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement Caltrans Standard BMPs and **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.
C-WR-10 Construction-Phase Sediment Basins. Install sediment basins (including debris basins, desilting basins, or silt traps) required by erosion control plans or otherwise necessary to control sedimentation during construction on the project site in conjunction with initial grading operations. Maintain sediment basins throughout the development process to remove sediment from runoff waters. All sediment shall be retained on site unless removed to an approved dumping location.	**Consistent.** As described in **Section 7, Geology, Soils, and Seismicity,** the project would avoid and mitigate impacts with implementation of **Mitigation Measure GEO-1: Site-Specific Construction Methods and Recommendations** where site-specific hazards at the project site would be addressed during an initial geotechnical investigation. Additionally, **Section 4, Biological Resources**, the project would implement **AMM BIO-3: Water Diversion and Dewatering** to avoid and mitigate impacts.
C-WR-13 Site Plan Contents – Post-Construction Element. At the discretion of the Department of Public Works based on the scale or potential water quality impacts of a proposed project, require that a coastal permit application for new development be accompanied by a site plan containing a Post Construction Element. This Post-Construction Element shall detail how storm water and polluted runoff will be managed or mitigated following project construction, utilizing both source control	**Consistent.** As described in **Section 10, Hydrology and Water Quality,** impacted waters located in the work area would either be treated per the requirements of a SWPPP prepared for the project or disposed of per 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

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and treatment control measures, and both structural and non-structural measures	outlined under the County's SWPPP. Water intake structures will be installed, operated, and maintained in accordance with current NMFS, USFWS, and CDFW criteria or as developed in cooperation with RWQCB and CDFW to accommodate site-specific conditions.
C-WR-15 Construction-Phase Pollution. Manage construction sites to prevent contact between runoff and chemicals, fuel and lubricants, cleansers, and other potentially harmful materials.	**Consistent.** As described in **Section 10, Hydrology and Water Quality,** impacted waters located in the work area would either be treated per the requirements of a SWPPP prepared for the project or disposed of per 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 SWPPP. Water intake structures will be installed, operated, and maintained in accordance with current NMFS, USFWS, and CDFW criteria or as developed in cooperation with RWQCB and CDFW to accommodate site-specific conditions.
C-WR-15 Construction-Phase Pollution. Manage construction sites to prevent contact between runoff and chemicals, fuel and lubricants, cleansers, and other potentially harmful materials.	**Consistent.** As described in **Section 10, Hydrology and Water Quality,** impacted waters located in the work area would either be treated per the requirements of a SWPPP prepared for the project or disposed of per 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 SWPPP. Water intake structures will be installed, operated, and maintained in accordance with current NMFS, USFWS, and CDFW criteria or as developed in cooperation with RWQCB and CDFW to accommodate site-specific conditions.
C-CD-15 Maintenance of the Rural Character of Roadways. Roadways and accessways shall reflect the character of coastal communities and shall be context and location sensitive. The primary areas to be	**Consistent.** As discussed in **Section 1, Aesthetics,** although the project would result in changes visible to motorists and residents, the project would conform to the existing visual landscape once complete and distant hillsides would remain visible from the project site. Once

Policy	Project Consistency
considered for sidewalks, curbs, and similar roadway improvements shall be within designated village boundaries.	operational, the overall visual quality of the project site would remain substantially unchanged.

APPENDIX C

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
Environmental Checklist Section 4, Biological Resources					
General Biological Resources.	**AMM BIO-1: Preconstruction Surveys** Prior to any ground disturbance, a qualified biologist shall conduct preconstruction surveys for special-status species and habitats in and adjacent to the proposed project area. These surveys shall 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) shall 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 shall be documented and relocated to an adequate cover site in the vicinity. The entrances and other refuge features within the project limits shall be collapsed or removed following investigation. Regulatory agencies shall be notified within 24 hours if any unanticipated listed species are identified during these surveys. 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 a qualified biologist (handling permit needed depending on the species).	Qualified Biologist; Construction contractor	Pre-Construction: prior to any ground disturbance	Marin County Community Development Agency (CDA) in coordination with Marin County Department of Public Works (DPW)	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-2: Biological Monitoring** The qualified biologist(s) shall be on-site during initial ground-disturbing and in-water activities, and thereafter as needed to fulfill the role of the qualified biologist as specified in the project permits. The qualified biologist(s) shall keep	Qualified Biologist; Construction contractor	Construction: During initial ground disturbance. Throughout in-water activities, thereafter,	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	copies of applicable permits in their possession when on site. Through the Resident Engineer or their designee, the qualified biologist(s) shall be given the authority to communicate either verbally, by telephone, email, or hardcopy with all project personnel to ensure that the risk of taking a listed species is minimized and that all permit requirements are fully implemented. Through the Resident Engineer or their designee, the qualified biologist(s) shall 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 qualified biologist(s) exercises this authority, the agencies shall be notified by telephone and email within 48 hours. During in-water activities, the qualified biologist shall monitor activities (e.g., installation and removal of cofferdams and pipes) for the purpose of avoiding and minimizing any undue impacts to coho salmon, central California coastal 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. A qualified biologist shall 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 qualified biologist shall be present at the work site until all listed species have been removed and relocated.		as needed to fulfill the role of the approved biologist as specified in the project permits.		

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	The qualified biologist shall 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 shall provide this information to NMFS and CDFW, as necessary.				
General Biological Resources.	**AMM BIO-3: Water Diversion and Dewatering** If flowing water is present in the channel, the flow shall 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. The temporary diversion shall be installed as close as possible to the construction area to minimize impacts to the flow of the stream and shall 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 shall be pumped out and piped to a downstream location. Any water intake structure shall 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 shall be released or pumped downstream at an appropriate rate to maintain downstream flows and the outlet of all diversions shall 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 shall be the minimum necessary to safely convey the flow through the	Construction contractor; Resident Engineer	Construction: Before work in the streambed commences and throughout project construction activities within the streambed.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	construction site and shall be placed on the streambed at natural grade. Diverted flows shall 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 shall be removed in a manner that minimizes disturbance to downstream flows and water quality. Creek diversion shall be limited to the minimum amount of time necessary to support construction activities.				
General Biological Resources.	**AMM BIO-4: Creek Bed and Bank Protection** The creek bed and banks shall be protected to prevent permanent impacts from temporary construction access and project construction. Construction equipment designed to apply low ground pressure shall be used in the channel to minimize compaction of the creek bed. If feasible, Native substrates removed during excavations and earthwork shall be stockpiled and returned to the creek bed and banks following project construction as part of the site restoration effort.	Construction contractor; Resident Engineer	Construction/ Post-Construction: Throughout demolition and construction activities and restoration efforts.	CDA in coordination with DPW	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-5: Fish and Wildlife Refugia Protection** Downed trees, stumps, boulders, and other basking sites and refuges within aquatic habitat shall remain undisturbed to the extent possible.	Construction contractor; Resident Engineer	Construction: Throughout demolition and construction activities.	CDA in coordination with DPW	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-6: Debris Containment** Debris containment shall be provided to keep bridge debris from falling into San Geronimo Creek during demolition and construction activities.	Construction contractor; Resident Engineer	Construction : Throughout demolition and	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
			construction activities.		
General Biological Resources.	**AMM BIO-7: Restoration and Revegetation** Modified or disturbed portions of the stream channel, banks, and riparian areas shall be restored as nearly as possible to natural and stable contours (elevations, profile, and gradient). Native substrates removed during excavations and earthwork shall be stockpiled and returned to the creek bed and banks. An assemblage of native grass seed mix and shrubs shall 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 shall be planted in areas on site and in kind to those requiring removal for construction access. Riparian plants shall also be planted along the banks in the areas of bank stabilization, RSP placement, and any disturbed areas. Live willow cuttings shall be used at the appropriate lower bank elevations (just above bank toe). Invasive, exotic plants shall be controlled within the project site to the maximum extent practicable, pursuant to Executive Order 13112.	Construction contractor; Resident Engineer	Construction: Throughout demolition and construction activities.	CDA in coordination with DPW	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-8: Management of Japanese Knotweed** Japanese knotweed is an invasive species prevalent within the region. If Japanese knotweed is identified in the project site, excavation around the plant shall be avoided when possible. When excavation around the plant cannot be avoided due to construction activities, the plant shall be excavated 10 feet below the surface and disposed of off-site.	Construction contractor, Resident Engineer	Construction: Throughout demolition and construction activities.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
General Biological Resources.	**AMM BIO-9: Aquatic and Riparian Vegetation Protection** Disturbance and removal of riparian, emergent, and aquatic vegetation shall be minimized. If riparian vegetation must be cut back, it shall be to the minimum height necessary (no lower than ground level) in order to promote rapid re-growth.	Construction contractor, Resident Engineer	Construction: Throughout construction activities within and adjacent to riparian, emergent, and aquatic vegetation areas.	CDA in coordination with DPW	Date: _____ Initials: _____
Risk of wildlife entrapment in excavations.	**AMM BIO-10: 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 shall 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, shall 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 shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped listed animal were discovered, the on-site qualified biologist shall immediately place escape ramps or other appropriate structures to allow the animal to escape or the USFWS/CDFW shall be contacted by telephone for guidance. The USFWS/CDFW shall be notified of the incident by telephone and electronic mail within 48 hours.	Construction contractor, Resident Engineer, Qualified Biologist	Construction: During ground-disturbing activities involving excavations or trenches and throughout the duration of construction until excavations are backfilled or removed.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
Wildlife attraction to construction materials.	**AMM BIO-11: Material Storage** California Red-legged Frogs (CRLFs) and other species 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 shall be inspected by the qualified biological monitor prior to being moved.	Construction contractor, Qualified Biologist	Construction: Prior to moving pipes, culverts, similar structures, construction equipment, or construction debris left overnight within the work area.	CDA in coordination with DPW	Date: _____ Initials: _____
Potential disturbance to nesting birds.	**AMM BIO-12: Nesting Birds** A nesting bird survey shall be performed by a qualified biologist no more than 7 days prior to the start of construction activities occurring during the breeding season (February 15 to August 31). If work is to occur within 100 feet of active raptor nests or 50 feet of active passerine nests, a non-disturbance buffer shall 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. To the extent practicable, clearing and grubbing activities and any tree removal shall be conducted during the non-nesting season, from October 15 to February 14.	Construction contractor, Qualified Biologist	Construction: No more than 7 days prior to the start of construction activities occurring during the breeding season (February 15 to August 31).	CDA in coordination with DPW	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-13: Worker Environmental Awareness Training** Prior to working on the project, all construction personnel shall attend a mandatory environmental education program delivered by a qualified biologist. At a minimum, the training shall include a description of listed species, migratory birds,	Qualified Biologist, Construction contractor	Pre-Construction: Before individual workers enter the project site during construction activities.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	and their habitats. The training shall also discuss the potential occurrence of these species within the project site; 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, shall be kept on file and shall be available on request.				
General Biological Resources.	**AMM BIO-14: Wildlife Exclusion Fencing** High visibility wildlife exclusion fencing at least 4 feet in height shall be installed around suitable habitat for listed species within the outer footprint of the project to prevent wildlife from accessing work areas. The fencing shall be removed only when all construction equipment is removed from the site. No project activities shall occur outside the delineated project area. The wildlife exclusion fencing shall be monitored periodically and all areas shall be checked following rain events. Construction activities occurring outside of suitable habitat for special-status species shall not require wildlife exclusion fencing.	Construction contractor, Resident Engineer	Construction: Wildlife exclusion fencing shall be installed before ground-disturbing activities. Monitoring shall occur periodically throughout the construction period.	CDA in coordination with DPW	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-15: Listed Species On-site** The Resident Engineer shall immediately contact the qualified biologist(s) in the event that coho salmon, steelhead, CRLF, or other listed species are observed within a construction zone. The Resident Engineer shall suspend construction activities within a 50-foot radius of the animal until the animal leaves the site voluntarily or an	Resident Engineer, Qualified Biologist, Construction contractor	Construction: The duration of construction, if listed species are observed within the construction area.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	agency-approved protocol for removal has been established.				
General Biological Resources.	**AMM BIO-16: Care of Injured or Dead Species** Listed species found injured will be cared for by a licensed veterinarian. After hours, interim care may be provided by another experienced person, including the on-site qualified biologist, until the animal can be delivered to a facility. Dead individuals of any listed species will be preserved by freezing and held in a secure location. The USFWS and/or CDFW will 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.	Construction contractor, Qualified Biologist	Construction	CDA in coordination with DPW	Date: _____ Initials: _____
General Biological Resources.	**AMM BIO-17: Removal of Exotic Wildlife Species** Qualified biologists will remove any aquatic exotic wildlife species, such as bullfrogs and crayfish from the project site, to the maximum extent possible.	Construction contractor, Qualified Biologist	Pre-Construction/ Construction	CDA in coordination with DPW	Date: _____ Initials: _____
Potential tree impacts from construction activities.	**AMM BIO-18: Tree Survey** In accordance with project permitting, trees within the project site shall be surveyed to account for construction impacts and appropriate mitigation.	DPW	Pre-Construction	CDA in coordination with DPW	Date: _____ Initials: _____
Loss or damage to existing trees.	**AMM BIO-19: Tree Protection** Tree preservation measures would be incorporated into the project design and implemented during project planning and construction to minimize tree removal and loss within the project site.	DPW	Pre-Construction/ Construction	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
Removal of trees requiring replacement.	**AMM BIO-20: Tree Replacement** The County shall include tree replacement in the post construction restoration plan at ratios as required in resource agency permits.	DPW	Pre-Construction/ Post-Construction	CDA in coordination with DPW	Date: _____ Initials: _____
Disturbance to aquatic species during work period.	**AMM BIO-21: Salmonid Work Period** In accordance with the NMFS and CDFW work window for salmonids, work in the San Geronimo Creek channel shall be restricted to the period from June 15 to October 15, when stream flow is lowest.	Construction contractor, Qualified Biologist	Construction: work in the San Geronimo Creek channel shall be restricted to the period from June 15 to October 15	CDA in coordination with DPW	Date: _____ Initials: _____
Impacts to critical aquatic habitat features.	**AMM BIO-22: Coho Salmon and Steelhead Critical Habitat and EFH Protection** Downed trees, stumps, boulders, and other refuges shall remain undisturbed as much as possible. Thermal refugia (pools) and suitable spawning sites shall remain undisturbed as much as possible. Disturbances to coho salmon and central California coastal steelhead critical habitat and EFH shall be documented by the qualified biologist and provided to NMFS as necessary.	Qualified Biologist	Construction	CDA in coordination with DPW	Date: _____ Initials: _____
Displacement of fish during relocation activities.	**AMM BIO-23: Fish Handling Plan** A fish handling and relocation plan shall be developed by the qualified aquatic biologist in coordination with NMFS and/or CDFW. Individual organisms shall be relocated the shortest distance possible to an adjacent upstream area with sufficient aquatic habitat. Within occupied habitat, capture, handling, exclusion, and relocation activities shall be completed no earlier than 48 hours before construction	Qualified Biologist, NMFS/CDFW, Construction contractor	Pre-Construction: Prior to initiation of in-channel work and no earlier than 48 hours before construction activities that may affect aquatic habitat, and as needed	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	begins. If electrofishing is conducted, it must be performed by a qualified biologist following NMFS guidelines. During fish relocation, all organisms shall be kept in water to the maximum extent possible and captured coho salmon and steelhead shall be kept in cool, shaded, well-aerated water and protected from disturbance and overcrowding until they are released. To avoid predation, separate containers shall be used: one for young-of-the-year coho and steelhead, and one for second or third-year coho and steelhead. Captured fish shall 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 shall 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*).		throughout construction activities within the stream channel.		
Potential presence of sensitive amphibian species.	**AMM BIO-24: California Red-legged Frog Preconstruction Survey.** No more than 48 hours prior to the date of initial ground disturbance, a preconstruction survey for the CRLF shall be conducted by a qualified biologist at the project site. The survey shall consist of walking the project limits and within the project site to ascertain the possible presence of the species. The qualified biologist shall investigate all potential	Qualified Biologist, USFWS, Construction contractor	Pre-Construction: No more than 48 hours prior to initiation of ground-disturbing activities and prior to the start of construction within the project area.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	areas that could be used by the CRLF 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 qualified biologist shall contact USFWS to determine if moving any of the individuals is appropriate. In making this determination, USFWS shall consider if an appropriate relocation site exists. If USFWS approves moving animals, the qualified biologist shall move the animals from the work site before ground disturbance is initiated. Only qualified biologists shall capture, handle, and monitor the CRLF.				
Disturbance to bat roosting habitat.	**AMM BIO-25: Bat Protection** Bat protection measures will be implemented as specified by CDFW under Section 1602 of the FGC. Measures may include but are not limited to conducting a habitat assessment for potentially suitable bat roosting habitat, implementing exclusionary measures as warranted, and performing presence/absence surveys if construction activities are scheduled during sensitive roosting or maternity periods. A qualified Biologist shall conduct a habitat assessment for potentially suitable bat roosting habitat, including within open expansion joints of the bridge and trees, March 1 to April 1 or August 31 to October 15 prior to bridge construction activities each season. If the habitat assessment reveals the bridge structure is suitable roosting habitat for bats, then the appropriate exclusionary	Qualified Biologist, Construction contractor	Pre-Construction/ Construction: Prior to initiation of bridge construction and tree removal activities, during applicable seasonal work windows, and as needed throughout construction activities when bat habitat assessments, exclusion, or presence/absence surveys are required.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	measures will be implemented prior to bridge construction during the period between March 1 and April 15 or August 31 to October 15. Potential avoidance may include exclusionary blocking or filling potential cavities with foam, visual monitoring, and staging project work to avoid bats. If bats are known to use the bridge structure, exclusion netting shall not be used. If suitable habitat is present within trees, and tree removal is scheduled from April 16 through August 30 and/or October 16 through February 28, then presence/absence surveys shall be conducted two to three days prior to any tree removal or trimming. If presence/absence surveys are negative, then tree removal may be conducted by following a two phased tree removal system. If surveys indicate bat presence, then the occupied trees shall only be removed from March 1 through April 15 and/or August 31 through October 15 by following the two-phased tree removal system. The two phased system shall be conducted over two consecutive days. On the first day, (in the afternoon), limbs and branches will be removed by a tree cutter using chainsaws or other hand tools. Limbs with cavities, crevices, or deep bark fissures shall be avoided, and only branches without those features are removed. On the second day, the entire tree shall be removed.				
Environmental Checklist Section 5, Cultural Resources, and Section 18, Tribal Cultural Resources					
General Cultural Resources and Tribal Cultural Resources	**Mitigation Measure CUL-1: Archaeological and Tribal Construction Monitoring** Due to the potential for buried pre-contact deposits to be present within the project site, a Secretary of the Interior-qualified archaeologist and a representative	Construction contractor; Archaeological monitor and a representative	Pre-Construction/ Construction: Prior to initiation of ground-disturbing activities and	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	of Federated Indians of the Graton Rancheria shall be required to monitor all ground-disturbing work associated with the project, with monitoring able to be reduced or discontinued based on a recommendation from the archaeologist and Federated Indians of the Graton Rancheria. Monitoring will not be required for ground-disturbing activities reoccurring in areas that have already been affected by project-related ground disturbance which were previously monitored with negative findings. Prior to the start of construction, the archaeologist will prepare an Archaeological Monitoring and Treatment Plan which will define specific roles and responsibilities of the parties involved in the project, communication protocols, pre-construction training, and specific tasks that will be carried out during the monitoring. If pre-contact archaeological deposits are identified during construction, all ground-disturbing work will halt within 100 feet of the discovery until a tribal representative from the Federated Indians of the Graton Rancheria can assess the find and provide treatment recommendations.	of Federated Indians of the Graton Rancheria	throughout construction during all monitored ground disturbance within areas of undisturbed soils, unless monitoring is reduced or discontinued based on recommendations from the qualified archaeologist and the Federated Indians of the Graton Rancheria.		
Encounter Buried Cultural Materials	**Mitigation Measure CUL-2: Unanticipated Cultural Resources** If buried cultural materials are encountered during project implementation, it is the policy of the California Department of Transportation that all work would stop within 100 feet of the discovery until a qualified archaeologist can evaluate the nature and significance of the find and provide recommendations. If feasible, preservation in place is the preferred manner of mitigating impacts to archaeological sites. Resources could include buried	Construction contractor and Archaeological monitor	Construction: During all ground-disturbing activities and throughout project construction in the event unanticipated cultural resources are encountered.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	historic features such as artifact-filled privies, wells, and refuse pits, and artifact deposits, along with concentrations of adobe, stone, or concrete walls or foundations, and concentrations of ceramic, glass, or metal materials. Native American archaeological materials could include obsidian and chert flaked stone tools (such as projectile points and knives), midden (darkened soil created culturally from use and containing heat-affected rock, artifacts, animal bones, or shellfish remains), and/or groundstone implements (such as mortars and pestles). If on National Park Service (NPS)-administered lands, and the culturally affiliated Indian tribe identifies the Native American archaeological materials as items meeting the definition of "Cultural items" (43 Code of Federal Regulations (CFR) Section 10.2), the Native American Graves Protection and Repatriation Act regulations at 43 CFR Part 10 Subpart B will be followed by the NPS Appropriate Official.				
Encounter Human Remains	**Mitigation Measure CUL-3: Encountering Human Remains** While the possibility is low, there remains a chance of encountering human remains either in association with pre-contact occupation sites or separately. Section 7050.5 of the California Health and Safety Code (H&SC 7050.5) states that it is a misdemeanor to knowingly disturb a human burial and Section 5097.99 of the Public Resources Code (PRC 5097.9) defines the obtaining or possession of Native American remains or grave goods to be a felony. If human remains are encountered as a result of construction activities on local right-of-way, any work in the vicinity shall stop, H&SC 7050.5 and PRC	Construction contractor and Archaeologist	Construction: During all ground-disturbing activities and throughout project construction in the event human remains are encountered.	CDA in coordination with DPW	Date: _____ Initials: _____

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
	5097.99 will be followed, and the Marin County Coroner shall be contacted immediately. In addition, a qualified archaeologist shall be contacted immediately to evaluate the discovery. If the human remains are Native American in origin, then the Coroner must notify the Native American Heritage Commission within 24 hours of this identification. If human remains are encountered as a result of construction activities on NPS-administered lands, any work in the vicinity shall stop and the Native American Graves Protection and Repatriation Act regulations at 43 CFR Part 10 subpart B will be followed by the NPS Appropriate Official.				

Mitigation Monitoring and Reporting Program Sir Francis Drake Boulevard Bridge Replacement Project					
Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
Environmental Checklist Section 7, Geology, Soils, and Seismicity					
Strong Seismic Ground Shaking, Seismic-related Ground Failure, Landslides, and Geologic Stability Impacts	**Mitigation Measure GEO-1**: **Site-Specific Construction Methods and Recommendations** Prior to approval of a demolition plan, a licensed geotechnical engineer shall prepare a design-level geotechnical report outlining site-specific construction methods and recommendations regarding grading activities, fill placement, soil corrosivity/expansion/erosion potential, compaction, foundation construction, drainage control (both surface and subsurface), and avoidance of settlement, liquefaction, differential settlement, and seismic hazards in accordance with current California Building Code requirements including Chapter 16, Section 1613. The report shall require that all subsurface improvements that include any materials susceptible to corrosive effects shall be engineered in conformance with the most recently adopted California Building Code requirements including the use of engineered backfill. The report shall also include stability analyses of final design cut and fill slopes, including recommendations for avoidance of slope failure. The final grading plan shall be designed and constructed in accordance with requirements of the final design-level geotechnical investigation prior to building.	Licensed geotechnical engineer	Pre-Construction: Prior to approval of demolition and grading plans and before initiation of ground-disturbing or building activities.	CDA in coordination with DPW	Date: _____ Initials: _____

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Impact	Mitigation	Implementation Responsibility	Implementation Timing	Monitoring Responsibility	Verification (Date and Initials)
Encounter Undocumented Paleontological Resources.	**Mitigation Measure GEO-2: Discovery of Paleontological Resources** Discovery of a paleontological specimen during any phase of the project shall result in a work stoppage in the vicinity of the find until it can be evaluated by a professional paleontologist. Should loss or damage be detected, additional protective measures or further action (e.g., resource removal), as determined by a professional paleontologist, shall be implemented to mitigate the impact to a less than significant level.	Construction contractor and Paleontologist	Construction: During all ground-disturbing activities and throughout project construction in the event paleontological resources are discovered.	CDA in coordination with DPW	Date: _____ Initials: _____
Environmental Checklist Section 9, Hazards and Hazardous Materials, and Section 15, Public Services					
Delay Emergency Response Operations	**Mitigation Measure HAZ-1: Notify Emergency Operations Center** At least ten days prior to the commencement of construction, the Emergency Operations Center would be notified regarding the planned closure of Sir Francis Drake Blvd. The Emergency Operations Center will notify the public about planned closures.	DPW	Pre-Construction: At least 10 days prior to commencement of construction activities involving roadway closures.	CDA in coordination with DPW	Date: _____ Initials: _____