Appendix C. Natural Environment Study (NES)

State Route 1 Multi-Asset Roadway Rehabilitation Project

Natural Environment Study

San Mateo County, California

04-SM-1-PM 27.5/34.8

EA 04-0Q130 / Project ID 04-1800-0053

May 2022

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Natural Environment Study

San Mateo County, California
04-SM-1-PM 27.5/34.8
EA 04-0Q130/Project ID 04-1800-0053
May 2022

STATE OF CALIFORNIA
Department of Transportation, District 4

Prepared By: _____ Date: 05/09/2022

David Pecora, Senior Biologist
(973) 525-9976
AECOM, Oakland Office
300 Lakeside Dr., Oakland, CA 94590

Prepared By: _____ Date: 05/09/2022

Dillon Lennebacker, Environmental Planner
(510) 874-3035
AECOM, Oakland Office
300 Lakeside Dr., Oakland, CA 94590

Approved By: _____ Date: 05/17/2022

Jessica Chavez, Associate Biologist
(510) 719-7483
Office of Biological Sciences and Permits
California Department of Transportation, District 4

Approved By: _____ Date: 5/27/2022

Gregory Pera, Branch Chief
(415) 535-1372
Office of Biological Sciences and Permits
California Department of Transportation, District 4

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List of Abbreviated Terms

ADA	Americans with Disabilities Act
AMM	avoidance and minimization measure
BMP	best management practice
BSA	biological study area
°C	degrees Celsius
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CCA	Coastal Commission Act
CCC	California Coastal Commission
CCTV	closed-circuit television
CCW	Coastal Commission Wetland
CDFW	California Department of Fish and Wildlife
CESA	California Endangered Species Act of 1984
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CWOS	culverted waters of the state
DPS	distinct population segment
EFH	essential fish habitat
ESU	evolutionarily significant unit
EO	Executive Order
ESA	environmentally sensitive area
°F	degrees Fahrenheit
FC	federal candidate
FE	federally endangered
FESA	federal Endangered Species Act
FHWA	Federal Highway Administration
FP	fully protected
FR	Federal Register
FT	federally threatened
HUC	Hydrologic Unit Code
IRI	International Roughness Index
LCP	Local Coastal Program
NES	Natural Environment Study

NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OWOS	other waters of the state
OWUS	other waters of the United States
PAD	Passage Assessment Database
PCA	Porter-Cologne Act
PCE	primary constituent element
PM	post mile
project	SR 1 Multi-Asset Roadway Rehabilitation Project
RWQCB	Regional Water Quality Control Board
SC	state candidate
SE	state endangered
SR	State Route
SSC	state species of special concern
ST	state threatened
TMS	traffic monitoring station
TOS	traffic operations system
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
WOS	waters of the state
WOTUS	waters of the United States
WWUS	wetlands of the United States

Summary

The California Department of Transportation (Caltrans) proposes to implement the State Route (SR) 1 Multi-Asset Roadway Rehabilitation Project (proposed project) in San Mateo County, California. The purpose of this proposed project is to restore SR 1 to a standard that will require only minimal maintenance expenditures, improve ride quality, upgrade the drainage system, improve roadway safety, enhance pedestrian and bicycle access, and upgrade the traffic system infrastructures.

The project biological study area (BSA) consists of the project footprint (permanent or temporary impact areas, including staging and access areas) along with buffer areas (surrounding the project footprint) that construction activities may directly or indirectly impact. The buffer areas were estimated based on the potential for project activities to cause noise, water quality, or geomorphological impacts. The BSA is 155.75 acres.

This Natural Environment Study provides technical information to determine the biological resources in the BSA and the extent to which the proposed project may affect special-status species, wetlands and waters, and other sensitive natural communities in the project footprint at each location.

Natural Communities in the Biological Study Area

Vegetation in the BSA is relatively common, with sensitive communities being limited to wetlands and other waters of the United States (OWUS) and waters of the state. The creek corridors at the creek crossings in the BSA consists of a vegetation type dominated by tall red alder (*Alnus rubra*) trees, and dense arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*) stands.

Special-Status Species in the Biological Study Area

The BSA contains potential habitat for special-status species that have moderate to high potential to occur at the site, based on literature/database searches, biological surveys, evaluation of appropriate habitat, and the habitat and life history requirements for each species.

The following federally and state-listed fish and wildlife species are either known to occur or have the potential to occur in the BSA:

Federally and State-Listed Species

- Coho salmon (*Oncorhynchus kisutch*) FE, SE
- steelhead (*Oncorhynchus mykiss irideus pop. 8*) FT
- California red-legged frog (*Rana draytonii) FE*
- San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) FE, FP

Special-Status and Locally Rare Species

- Ornduff's meadowfoam (*Limnanthes douglasii* ssp. *ornduffii*) CRPR 1B.1
- Protected and migratory birds

Potential Impacts to Aquatic Habitats

No permanent impacts to potentially jurisdictional waters of the United States (WOTUS) would occur. Temporary impacts to 0.001 acre of wetland waters of the United States (WWUS), 0.020 aces of other waters of the United States (OWUS), and 0.020 acres of culverted waters of the United States (CWUS) would occur.

A total of 0.20 acres of potential wetlands and riparian habitat that are subject to California Coastal Commission (CCC) jurisdiction would be permanently impacted, and a total of 0.52 acres would be temporarily impacted.

Potential Impacts to Upland Habitats

The project would result in temporary and permanent impacts to upland habitats the affected upland habitats are not sensitive natural communities, but may serve as potential habitat for special-status wildlife species.

Cumulative Impacts

The proposed project is not growth-inducing and is not anticipated to result in an increase in vehicular traffic; any new development; or any associated future increases in lighting, noise, or vibrations. In addition, the project will not create any new permanent barriers to species' movement. Therefore, it will not contribute to cumulative effects on any listed, proposed, or candidate species.

Proposed Avoidance, Minimization, and Compensation

Caltrans proposes several general and species-specific avoidance and minimization measures. These measures include preconstruction surveys; onsite biological monitoring; a biological worker awareness education program; avoidance of sensitive biological resources through establishment of environmentally sensitive areas and seasonal work restrictions; and best management practices to protect water quality and minimize erosion. Impacts to WOTUS and waters of the state, as well as CCC wetlands and riparian areas are anticipated to be temporary and would be offset by project measures to restore disturbed areas in kind. Compensatory mitigation is not anticipated at this time. Caltrans has included project features and proposes avoidance and minimization measures to offset temporary impacts during construction. Additional measures may be determined in coordination with state and federal agencies with jurisdiction during the project's final design and permitting phase.

Regulatory Agencies and Required Permits

The proposed project would require work in aquatic and upland habitats with natural vegetation and in locations where several regulatory agencies have jurisdiction and would require permits. The following permits are expected to be required for this project:

- United States Fish and Wildlife Service Section 7 Consultation under the federal Endangered Species Act
- United States Army Corps of Engineers Section 404 permit (likely a Nationwide permit) under the Clean Water Act

- Regional Water Quality Control Board Section 401 Water Quality Certification under the Clean Water Act
- California Department of Fish and Wildlife Lake and Streambed Alteration Agreement under the Fish and Game Code Section 1602
- Coastal Development Permit through the City of Half Moon Bay Local Coastal Program

Chapter 1: Introduction

The California Department of Transportation (Caltrans) proposes the State Route (SR) 1 Multi-Asset Roadway Rehabilitation Project (proposed project) to rehabilitate the existing pavement, improve existing traffic facilities, install complete streets elements, and install traffic operations system (TOS) elements along SR 1 in San Mateo County, California. The proposed project would include pavement rehabilitation; replacing existing drainage inlets, culverts, and dikes; replacing existing guardrails with Midwest guardrail systems; replacing existing crash cushions; upgrading curb ramps; implementing complete street elements; upgrading signal poles; installing conduits; installing traffic operation system elements (intersection cameras, closed-circuit television (CCTV) cameras, and traffic monitoring stations [TMSs]); and relocating and/or replacing utility cabinets.

1.1 Project Purpose and Need

1.1.1 Purpose

The proposed project would preserve and extend the life of the roadway to a condition that requires minimal maintenance expenditures; improves the ride quality; upgrades drainage systems; improves roadway safety; enhances the pedestrian and bicycle access; and upgrades the traffic system infrastructure.

1.1.2 Need

The pavement on SR 1 in the proposed project area was evaluated in 2016 and is in poor condition overall (Caltrans 2016). Caltrans uses the International Roughness Index (IRI) to evaluate and determine how smooth or rough a pavement surface is. The Federal Highway Administration (FHWA) IRI threshold for acceptable pavement surface is between 170 and 96; the threshold for good road surface is 95 or less; and surfaces that are greater than 170 do not meet the acceptable threshold. This stretch of highway ranges from 100 to 226. If left untreated, this portion of SR 1 would continue to provide poor ride quality to users and would require frequent and expensive maintenance. In addition, existing highway elements and facilities within the proposed project limits are worn out or functionally obsolete and need to be replaced. The current traffic systems (e.g., guard rails, crash cushions, and drainage) are approaching their end of life and need to be upgraded. The complete street elements (e.g., curb ramps, sidewalk, and crosswalks) need to be upgraded.

1.2 Project Description

This section describes the proposed project developed to meet the project's purpose and need while avoiding or minimizing impacts to wetlands, waterways, and other sensitive habitats and natural resources. The alternatives include the proposed build alternative and a no-build alternative. The no-build alternative would not meet the project's purpose and need and is not discussed further in this document. Project elements are described in this section, and a mapbook summarizing all project elements at their locations is provided as Appendix A.

1.2.1 Project Location

The proposed project would occur in and north of the City of Half Moon Bay in San Mateo County, California. The project is on SR 1 between post mile (PM) 27.5 and PM 34.8; and SR 92 at PM 0.2 (Figure 1-1).

1.2.2 Site Preparation

1.2.2.1 Installation of Signaling and Traffic Control Measures

K-rails would be installed, and temporary lane closures would be established to create the necessary workspace for construction. Traffic control measures would include use of metal signage, flashing signal lights, and traffic cones. Any vegetation obstructing the work area or where excavation is necessary would be trimmed and removed.

1.2.2.2 Access, Staging, and Laydown Areas

Caltrans would locate staging for construction within its right-of-way outside of environmentally sensitive areas (ESAs) or, if outside of its right-of-way, in previously disturbed or developed areas. Staging locations would implement all appropriate measures to avoid and minimize impacts to environmental resources to the greatest extent feasible. Staging locations would be determined during the project's final design phase.

1.2.3 Roadway Rehabilitation

Caltrans proposes a 20-year flexible rehabilitation pavement strategy to address poor pavement conditions. To rehabilitate the roadway, Caltrans would cold plane (mill the roadway surface down to design depths to restore and smooth the roadway conditions) 0.40 foot of existing asphalt concrete pavement, then replace it with a structural section composed of 0.20 foot of gap-graded rubberized hot-mix asphalt, a 0.25 foot hot-mix asphalt and geosynthetic pavement interlayer, and 0.10 foot of hot-mix asphalt. The roadway profile would be raised by about 0.15 foot at project completion. Pavement rehabilitation would occur across the entire project location and is generally shown in Figure 1-2, with detailed paving limits shown in Appendix A.

1.2.4 Replace Existing Guardrails

All existing guardrails in the project area would be removed and replaced with standard Midwest guardrail systems (Figure 1-2). Vegetation removal to access guardrails may be required, and excavation would be necessary during construction. Wood support posts would be installed in drilled holes to an approximate depth of 4 feet below the ground. Deeper holes may be recommended to address traffic safety standards at specific locations.

1.2.5 Replace Existing Crash Cushions

Existing nonstandard or damaged crash cushions in the project area would be replaced at the same locations with new crash cushions that meet current Caltrans standards for design and safety.

AECOM Oakland CA 4/21/2022 USER alexander.remar PATH \\na.aecomnet.com\lfs\AMER\Oakland-USOAK01\DCS\Projects\GIS\Projects\Caltrans On-Call\02_Maps\OQ130_SM1SM2_C4PM_VMS\02_Map_Production_and_Reports\PD\Figure 1-1 Project Vicinity.mxd

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FIGURE 1-1

Project Vicinity

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FIGURE 1-2

Roadway Rehabilitation and Guard Rail Replacement Locations

1.2.6 Upgrade Signal Poles

All nonstandard poles within the project area would be replaced. The size of the poles would be determined by during the project's final design phase. Excavation would be required during replacement.

1.2.7 Install Conduits, and Traffic Operation System Elements

The proposed TOS elements are needed because SR 1, through the project area, lacks traffic monitoring systems that can be used to collect data on traffic flow and volumes. These data can be used to inform future planning decisions and projects in San Mateo County. Overall, Caltrans anticipates that inclusion of TOS elements into this project would improve traffic congestion along the corridor by helping to identify future transportation needs and deficiencies.

The project proposes to upgrade and install new communication devices, such as CCTV cameras, fixed intersection cameras, and TMSs. Figure 1-3 through Figure 1-5 illustrate the proposed locations for these TOS elements. New conduit installation to support these elements would require trenching during installation.

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FIGURE 1-3

Closed Caption Television Camera Locations

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FIGURE 1-4

Fixed Intersection Camera Locations

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FIGURE 1-5

Traffic Management System Locations

1.2.8 Replace Existing Drainage Inlets, Culverts, and Dikes

Caltrans' hydraulic engineers have conducted a preliminary review of existing drainage elements and anticipate the following work:

- Replacement of 12 inch-diameter pipes with 18 inch-diameter pipes
- Replacement of a headwall and 20 foot-long pipe for a 72 inch-diameter reinforced concrete pipe at PM 31.31
- Addition or replacement of flared end sections at ends of pipes as needed
- Lining the inside of 24 inch, 36 inch, and 60 inch pipes as needed
- Cleaning and clearing buried pipe ends to maintain flow pattern
- Repairing or replacing damaged headwalls to improve flow into culverts
- Regrading certain unlined ditches to maintain original flow pattern
- Cleaning existing drainage facilities

Excavation would be required during culvert replacement work. Typical culvert replacement work would require an excavation width that would be 2 feet wider than the culvert (1 foot on each side); the excavation depth would be same as the depth of the existing culvert; and the excavation length would be about 2 feet longer than the existing culvert. Where culvert headwall installations are required, it would increase the length of excavation by a few feet, depending on final headwall design. Caltrans is completing survey work to refine its understanding of existing drainage elements. Figure 1-6 summarizes general locations, and details of drainage improvements are summarized in Appendix A.

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FIGURE 1-6

Drainage System Improvement Locations

1.2.9 Upgrade Curb Ramps

All existing nonstandard curb ramps within the project limits would be replaced with curb ramps that meet current Caltrans standards and would be compliant with Americans with Disabilities Act (ADA) requirements. The type and design of curb ramps will be determined based on location-specific conditions during the project's final design phase. Excavation for curb ramps would be necessary during construction.

1.2.10 Complete Streets

Sidewalks, curb ramps, and marking would be constructed throughout the project area to provide access for pedestrians and cyclists. Locations where Complete Streets elements are proposed are shown on Figure 1-7, and details are provided in Appendix A. The following street elements would be included as part of the project:

- Class II bike lanes with striped buffers would be created on SR 1 in the project area.
- Pedestrian facilities would be installed along the western side of SR 1, from Kelly Avenue to San Mateo Road (SR 92).
- Intersection improvements would occur, as follows:
    - In general, curve radii would be minimized, and curb extensions would be provided where curb ramp work is proposed to meet ADA requirements.
    - Crosswalks would be striped where the Class I path crosses Seymour Street, Grove Street, Filbert Street, Belleville Boulevard, Grand Boulevard, Kehoe Avenue, Frontage Road, Venice Boulevard, Frenchman's Creek Road, Young Avenue, and Alto Avenue. Corner radius would be reduced, and curb ramps and/or path entrances would be squared up at these locations as appropriate.
    - A fourth crosswalk would be installed across SR 1 at the Kelly Avenue intersection's northern leg, the right-turn slip lanes that exit from and enter northbound SR 1 would be removed, and the intersection would be squared up.
    - The new sidewalk would be squared up on the eastern side of SR 1 and the SR 1/SR 92 intersection. Crosswalks would be installed on all four legs to connect to the sidewalk from Kelly Avenue to SR 92 and/or provide a connection from the eastern side of SR 1 to the segment of the Naomi Partridge Trail that crosses under SR 1 at the Pilarcitos Creek Bridge.
    - The slip lane at the SR 1/SR 92 intersection would be removed to accommodate pedestrian and bicycle crossing, or rectangular rapid flashing beacon and high-visibility crosswalks would be installed.

  - A third crosswalk would be installed at the southern leg of the SR 1/Coronado Street intersection, to minimize crossings to the nearby school. The sidewalk on the western side of SR 1 would be connected to the southwestern corner, to connect with the new crosswalk.

  - New crosswalks would be squared up with and installed on all four legs of the SR 1/Capistrano Road intersection.

- If the culvert is replaced at Arroyo de en Medio, the design would bring the shoulders up to current design standards.

- Transit stops would be paved, and new sidewalks would be connected along SR 1.

- Coordination with San Mateo County would occur to complete the medium to long-term improvements that are proposed in the Caltrans-funded SR 1 Safety and Mobility Improvement Studies (http://planning.smcgov.org/highway-1-safety-and-mobility-study) and the “Connect the Coastside” Comprehensive Transportation Management Plan (http://www.midcoastcommunitycouncil.org/comp-transp-mgmt-plan/).

The project is currently in discussions with local stakeholders to consider including a mid-block crossing on SR 1 at Surfer’s Beach in the community of El Granada. This may include new striping and flashing beacon lights in the crosswalk. The project has not determined whether this element is to be included in the project, and it is not analyzed in this document.

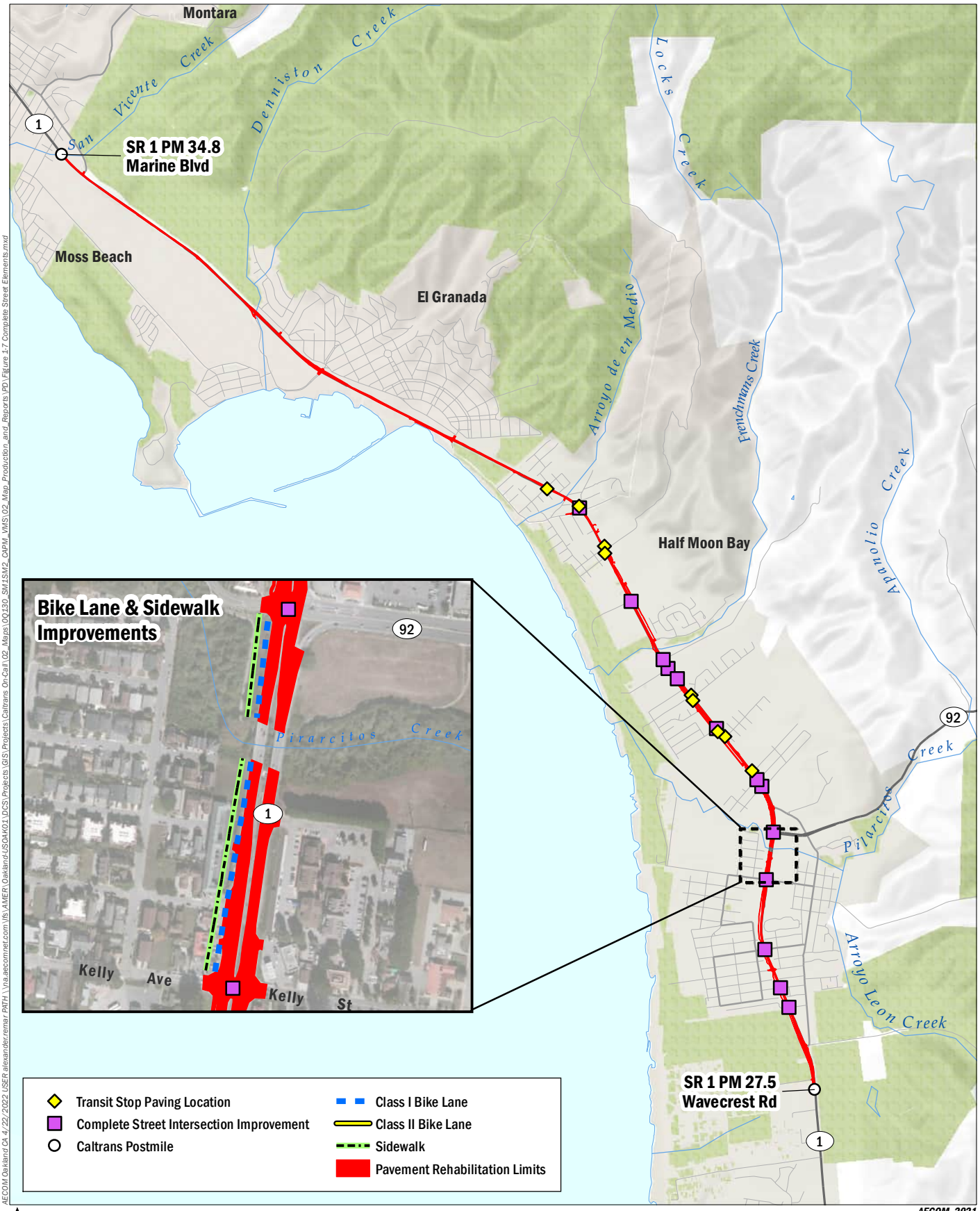

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FIGURE 1-7

Bicycle, Pedestrian and Complete Street Improvement Locations

1.2.11 Utility Relocation

Existing utilities may need to be relocated during construction. Specific utilities that would need relocation would be determined during the project's final design phase. Some utilities may require vegetation clearance and excavation during construction.

1.2.12 *Site Clean-up and Restoration*

All construction-related materials will be removed after completion of construction activities. Temporary staging areas would be cleaned up, and any remaining construction materials would be removed and hauled to an appropriate waste disposal facility. The project footprint would be contained primarily within paved areas and graveled/previously disturbed road shoulders. Vegetation restoration in-kind is anticipated where temporary impacts to existing vegetation would occur for construction access.

1.3 Construction Equipment

Light construction equipment, such as backhoes, will be used to excavate soils and drill holes. Standard two-axle vehicles and diesel-powered vehicles with air brakes (e.g., dump trucks) may also be used. Other equipment may include generators, hoe rams, jackhammers, and saw-cut machines. The contractor may select alternative but similar vehicles or equipment, based on site-specific considerations.

1.4 Project Schedule

The proposed project is currently in the conceptual phase. During this stage of project delivery, Caltrans refines its conceptual design and completes its environmental review under the California Environmental Quality Act and National Environmental Policy Act. Table 1-1 summarizes the major project delivery milestones and their target delivery dates.

Table 1-1 Proposed Project Schedule

Caltrans Project Milestone	Milestone Description	Target Date
Draft environmental document	Circulate Draft Environmental Document for public review and comment	April 2022
Project approval and environmental document complete	Final Environmental Document filed with the State Clearinghouse	October 2022
Plans, specifications, and estimates complete	Final design, specifications, bid estimates, and environmental permitting complete	April 2024
Approve contract	Initiate construction	October 2024
Contract acceptance	Construction complete	October 2026

Note:
Caltrans = California Department of Transportation

Construction is due to begin in 2024. All construction activities will be limited to the dry season, thus avoiding or minimizing impacts to special-status species and wetlands during the wet season. Construction activities may occur in both daytime and nighttime hours.

1.5 Alternatives

A single build alternative was considered in this analysis that meets the project's purpose and need.

Under the no build alternative, the existing pavement would not be rehabilitated. The no build alternative would not meet the project purpose and need because the condition of the pavement and highway appurtenances would continue to deteriorate, requiring frequent maintenance and extensive repairs. Furthermore, the no build alternative would result in greater expense in the future, including major reconstruction that would eventually become necessary. The no-build scenario is considered here as a baseline condition to the proposed alternative.

1.5.1 Alternatives Considered but Eliminated from Further Discussion

A variant of the proposed project's pavement rehabilitation strategy was considered. This consisted of a 40-year flexible rehabilitation pavement strategy under which a new structural section would be installed to replace the existing road layers rather than cold planning and rehabilitating the existing roadway. However, this would result in a substantially greater disturbed soil area because the total thickness of the existing structural layers would be less than that of the proposed project at most locations. Due to the high risk of increased impacts and mitigation for a disturbed soil area, in addition to the higher combined total cost, this pavement rehabilitation strategy was eliminated from consideration.

1.6 Project Features

The general project features listed below will be incorporated into the proposed project to reduce potential impacts to sensitive biological resources. The project features will be communicated to the contractor using special provisions included in the contract bid solicitation package.

1. **Worker Environmental Awareness Training:** Construction personnel will attend a mandatory environmental education program delivered by the United States Fish and Wildlife Service (USFWS)-Approved Biological Monitor prior to taking part in site construction, including fence installation and other ground-disturbing and/or vegetation clearing activities. The program will focus on the conservation measures that are relevant to an employee's personal responsibility and will include an explanation of how to best avoid take of listed species. At a minimum, the training will include a description of the listed species that may occur on site; how they might be encountered in the project construction zone; their status and protection; and the relevant Conservation Measures and Terms and Conditions of the Biological Opinion. A fact sheet conveying this information will be prepared and distributed to all construction and project personnel.

Distributed materials will include cards with distinctive photographs of the species, compliance reminders, and relevant contact information. Documentation of the training, including sign-in sheets, will be kept on file, and made available to the USFWS upon request.

2. **Environmentally Sensitive Area Fencing:** Prior to the start of construction, ESAs (defined as areas containing sensitive habitats adjacent to or in construction work areas for which physical disturbance is not allowed) will be clearly delineated using temporary high-visibility fencing or temporary reinforced silt fences with high-visibility fabric on top (Type 1). Construction work areas will include the active construction site and all areas providing support for the project, including areas used for vehicle parking; equipment and material storage and staging; and access roads. The fencing will remain in place throughout the duration of construction activities, be inspected regularly, and be fully maintained at all times. The final project plans will show all locations where the fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities, including vehicle operation; material and equipment storage; access roads; and other surface-disturbing activities in ESAs.

3. **Inclement Weather Restriction:** No work will occur during or within 24 hours following a rain event exceeding 0.2 inch, as forecast by the National Oceanic and Atmospheric Administration National Weather Service for Half Moon Bay, California (C3295) base station. USFWS/California Department of Fish and Wildlife (CDFW) approval to continue work during or within 24 hours of a rain event will be considered on a case-by-case basis.

4. **Light Restrictions:** Construction personnel will turn portable tower lights on no more than 30 minutes before the beginning of civil twilight, and off no more than 30 minutes after the end of civil sunrise. Portable tower lights will have directional shields attached to them, and personnel will only direct lights downward and toward active construction and staging areas. Lighting per portable tower light will not exceed 2,000 lumens. To the extent practicable, personnel will only use enough coverage to light the work areas.

5. **Staging:** Staging and parking areas will be restricted to designated areas, as specified by the project biologist in coordination with the project engineer.

6. **Soil Storage:** Imported soil or native topsoil may be stored in a designated location, as specified by the project biologist in coordination with the project engineer, until project completion.

7. **Vegetation Removal:** Vegetation removal will be limited to the designated work areas needed for access and workspace. Where possible, vegetation removal in temporary work areas will be cut above soil level to promote revegetative growth of established plants following construction.

8. **Replant, Reseed, and Restore Disturbed Areas:** Caltrans will restore temporarily disturbed areas to their preconstruction contours and functions to the maximum extent practicable. Exposed slopes and bare ground will be reseeded with native, local grasses and shrubs to stabilize and prevent erosion. Where disturbance includes the removal of trees and woody shrubs, coordination with the appropriate permitting agency will be warranted, and planting may be required. A local hydroseed mix will be proposed in the plans, specifications, and estimates phase.

9. **Migratory Bird Treaty Act:** To minimize and avoid take of migratory birds, their nests, and their young, Caltrans will conduct vegetation and tree trimming from October 1 through January 31—before project construction—when possible. This work will be limited to vegetation and trees that are within the project footprint. No grubbing or other ground-disturbing work will occur at this time. Upon completion of vegetation and tree trimming, Caltrans will install stormwater and erosion control best management practices (BMPs). During the nesting season (February 15 through September 30), a qualified biologist with appropriate construction and species experience will conduct nest and bird surveys and other wildlife surveys prior to tree removal and applicable pruning. All work will be conducted under a Regional Water Quality Control Board (RWQCB)-approved Water Pollution Control Plan or Storm Water Pollution Protection Plan. During the nesting season, pre-construction surveys for nesting birds will be conducted by a qualified biologist no more than 72 hours prior to the start of construction activities. If work is to occur within 300 feet of active raptor nests or 50 feet of active other migratory/nongame bird nests, a no disturbance buffer will 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 disturbance. All clearing and grubbing of woody vegetation will be performed by hand or using light construction equipment, such as backhoes and excavators.

10. **Fish Passage Assessment:** In accordance with Caltrans policy and Senate Bill 857, Caltrans will conduct first-pass fish passage surveys of all unassessed stream crossings in the Project Footprint. The survey results will be provided to the Passage Assessment Database maintained by CDFW.

11. **Invasive Species Management:** To reduce the spread of invasive nonnative plant species and minimize the potential decrease of palatable vegetation for wildlife species, Caltrans will comply with Executive Order (EO) 13112. The purpose of this order is to prevent the introduction of invasive species and provide for their control to minimize economic, ecological, and human health impacts. In the event that high- or medium-priority noxious weeds, as defined by the California Department of Food and Agriculture or the California Invasive Plant Council (Cal-IPC), are disturbed or removed during construction-related activities, the contractor will contain the plant material associated with these noxious weeds and will dispose of it in a manner that will not promote the spread of the species. The contractor will be responsible for obtaining all permits,

licenses, and environmental clearances for properly disposing materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the area will be covered to the extent practicable with heavy black plastic solarization material until completion of construction. All earthmoving equipment, as well as seeding equipment to be used during project construction, would be thoroughly cleaned before arriving on the project site.

12. **Implementation of Water Quality/Erosion Control BMPs:** Erosion control BMPs will be developed and implemented to minimize any wind- or water-related erosion, in compliance with the requirements of the RWQCB. Protective measures will include, at a minimum, the following:

    a. No discharge of pollutants from vehicle and equipment cleaning will be allowed into any storm drains or watercourses.

    b. Vehicle and equipment fueling and maintenance operations will be kept at least 50 feet away from watercourses, except at established commercial gas stations or established vehicle maintenance facilities.

    c. Concrete wastes will be collected in washouts, and water from curing operations will be collected and disposed. Neither will be allowed into watercourses.

    d. Spill containment kits will be maintained on site at all times during construction operations and/ or staging or fueling of equipment.

    e. Dust control measures will include use of water trucks and dust palliatives to control dust in excavation-and-fill areas; covering temporary access road entrances and exits with rock (rocking); and covering temporary stockpiles when weather conditions require.

    f. Coir rolls or straw wattles that do not contain plastic or synthetic monofilament netting will be installed along or at the base of slopes during construction to capture sediment.

    g. Graded areas will be protected from erosion using a combination of silt fences and fiber rolls along toes of slopes or along edges of designated staging areas; erosion control netting (e.g., jute or coir) will be used as appropriate on sloped areas. Erosion control materials that use plastic or synthetic monofilament netting will not be used in the project footprint. This will include products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials will include natural fibers, such as jute, coconut, or twine.

13. **Construction Site BMPs:** The following site restrictions will be implemented to avoid or minimize impacts on special-status species and their habitats:

a. Routes and boundaries of roadwork will be clearly marked before the start of construction or grading.

b. All food and food-related trash items will be enclosed in sealed trash containers and will be properly disposed off site.

c. No pets belonging to project personnel will be allowed anywhere in the project area during construction.

d. No firearms carried by project personnel will be allowed except for those carried by authorized security personnel or local, state, or federal law enforcement officials.

e. A spill response plan will be prepared. Hazardous materials (e.g., fuels, oils, or solvents) will be stored in sealable containers in a designated location at least 50 feet from any aquatic features.

14. **Speed Reduction:** Project-related vehicles will be required to observe a 10-mile-per-hour speed limit in all staging or storage areas.

Chapter 2: Study Methods

This chapter provides a description of the study methods used to evaluate the potential for special-status species and waters of the United States (WOTUS) to occur in the biological study area (BSA). Caltrans used the best scientific and commercial data available to fully assess the habitats and potential for listed species to occur in the BSA.

2.1 Regulatory Requirements

The following state and federal laws and requirements are potentially applicable to the project in the BSA.

- Clean Water Act (CWA), Sections 404 and 401
- Federal Endangered Species Act (FESA)
- Migratory Bird Treaty Act
- EO 13112 (Invasive Species)
- Magnuson-Stevens Fishery Conservation and Management Act

In addition to the federal laws and regulations, the following state laws and regulations apply to the proposed project:

- California Endangered Species Act (CESA)
- California Fish and Game Code (CFGC) Sections 1600-1607 Lake or Streambed Alteration Agreement
- Porter-Cologne Water Quality Control Act
- CFGC Section 2080.1 Incidental Take Permit
- California Coastal Act

2.1.1 Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to WOTUS from any point source unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the CWA. Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following CWA sections are relevant to this study:

- Section 404 establishes a permit program for the discharge of dredge or fill material into WOTUS. This permit program is administered by the United States Army Corps of Engineers (USACE).

- Under Section 401, an applicant for a federal license or permit that allows activities resulting in a discharge to WOTUS must obtain certification from the state, confirming that the discharge complies with other provisions of the CWA. The RWQCBs administer the certification program in California. The guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE's Individual permits.

2.1.2 Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] 403) requires authorization from USACE for the construction of any structure in or over any navigable WOTUS. Structures or work outside the limits defined for navigable WOTUS require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, channelization, or any other modification of navigable WOTUS and applies to all structures, from the smallest floating dock to the largest commercial undertaking. It further includes, without limitation, any wharf, dolphin, weir, boom breakwater, jetty, groin, bank protection (e.g., riprap, revetment, or bulkhead), mooring structures such as pilings, aerial or subaqueous power transmission lines, intake or outfall pipes, permanently moored floating vessel, tunnel, artificial canal, boat ramp, aids to navigation, and any other permanent or semi-permanent obstacle or obstruction.

2.1.3 Porter-Cologne Water Quality Control Act

The RWCQBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities that may result in a discharge to WOTUS. This is most frequently required in tandem with a Section 404 permit request.

2.1.4 Federal Endangered Species Act of 1973 (16 USC 1531 1543)

FESA and its subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. FESA provisions protect federally listed threatened and endangered species and their habitats from unlawful take. "Take" under FESA includes activities such as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." USFWS regulations define harm to mean "an act which actually kills or injures wildlife." Such an act "may" include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 Code of Federal Regulations [CFR] Section 17.3). Activities that may result in "take" of individuals are regulated by USFWS. USFWS produced an updated

list of candidate species October 25, 1999 (50 CFR Part 17). Candidate species are not afforded any legal protection under FESA; however, candidate species typically receive special attention from federal and state agencies during the environmental review process.

2.1.5 California Coastal Act

The California Coastal Act of 1976 tasked the California Coastal Commission (CCC) with protecting California's coastal resources, including shoreline public access and recreation, terrestrial and marine habitat, visual resources, landform alteration, commercial fisheries, and water quality. Any development in the Coastal Zone requires a Coastal Development Permit. CCC has delegated its coastal development permitting authority to separate approved Local Coastal Programs (LCPs), which are administered by local governments. LCPs are planning tools used by local governments to guide a wide array of development in the coastal zone. The LCPs are developed through a partnership with the CCC. The project footprint occurs partially within the LCP administered by the City of Half Moon Bay.

The CCC established a wetland definition that requires evidence of only one of three parameters (hydrophytic vegetation, hydric soils, or wetland hydrology) to establish wetland conditions (CCC 1981, 2011). Therefore, areas that are not considered wetlands in the CWA for USACE jurisdiction may be considered wetlands under the CCC definition of a wetland.

2.1.6 California Fish and Game Code Section 1600 Lake or Streambed Alteration Agreement

A Section 1600 Lake or Streambed Alteration Agreement with the CDFW is necessary when a project will alter the flow, bed, channel, or bank of streams or lakes. The project involves placing rock slope protection into the bed and bank of a creek and will require a Section 1602 application for a Lake and Streambed Alteration Agreement.

2.1.7 California Endangered Species Act

CESA is a California environmental law enacted in 1970 and amended in 1984 and 1997 that conserves and protects plant and animal species at risk of extinction. Plant and animal species may be designated threatened or endangered under CESA after a formal listing process by the California Fish and Game Commission. CESA consultation with the CDFW is necessary when a project may result in take of a state-listed species.

2.1.8 California Fish and Game Code Section 2081 Incidental Take Permit

An Incidental Take Permit from CDFW, pursuant to CFGC Section 2081, is required if an activity would hunt, pursue, catch, capture, or kill attempt to hunt, pursue, catch, capture, or kill a state-listed species. The project could include activities that would result in take of a state-listed species and could require an application for an Incidental Take Permit.

2.1.9 Migratory Bird Treaty Act

The Migratory Bird Treaty Act 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 Part 21). All nesting birds protected under this law will need to be avoided during construction of the proposed project. Avoidance can be accomplished by performing all vegetation clearing outside of the bird nesting season (approximately February 15 to September 30) and/or conducting preconstruction surveys for nests and erecting a buffer zone around active nests inside which work cannot be performed.

2.1.10 Executive Order 11990 – Protection of Wetlands

The EO for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies regarding wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction in wetlands unless the head of the agency finds (1) that there is no practicable alternative to the construction, and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

2.1.11 Executive Order 13112 – Invasive Species

On February 3, 1999, President William J. Clinton signed EO 13112, requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” FHWA guidance issued August 10, 1999, directs the use of the state’s invasive species list, maintained by the California Invasive Species Council, to define the invasive plants that must be considered as part of the National Environmental Policy Act analysis for a proposed project.

Under the EO, federal agencies cannot authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered.

2.1.12 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires federal agencies undertaking, permitting, or funding activities that may adversely affect essential habitat (EFH) for anadromous fish, including salmonids, to consult with the National Marine Fisheries Service (NMFS). EFH for California Central Coast coho salmon evolutionarily significant unit (ESU) and California Central Coast steelhead distinct population segment (DPS) is present at the project sites, and NMFS will be consulted in conjunction with the Section 7 consultation process under FESA.

2.2 Studies Required

The natural environment in the BSA was evaluated through a combination of field surveys, database searches, and literature reviews. The evaluation involved a review of the following sources:

- California Natural Diversity Database (CNDDB) Rarefind 5
- California Native Plant Society (CNPS) Online Inventory of Rare and Endangered Plants, 9th Edition
- USFWS Information for Planning and Conservation (IPaC) species list database
- USFWS designated Critical Habitat Mapper
- NMFS Google Earth tool for developing an Official Species List
- Passage Assessment Database (PAD)
- The Center for Ecosystem Management and Restoration's Steelhead/Rainbow Trout Resources South of the Golden Gate, California (Becker and Reining 2008)

2.3 Personnel and Survey Dates

General reconnaissance-level surveys were conducted in the BSA for plant communities, wildlife habitats, and general site-specific information to support an evaluation of biological resources. More targeted surveys, including an aquatic resource delineation survey and vegetation mapping, were also performed. Focused botanical surveys are planned for spring of 2022. Table 2-1 provides the dates and times for the specific surveys and the personnel who conducted the surveys.

Table 2-1 Survey Type, Date, and Personnel

Survey Type	Date	Personnel
Aquatic Resource Jurisdictional Delineation	September 7, 8, and 15, 2021	Joe Bandel and Danny Slakey
Vegetation Survey	September 7, 8, and 15, 2021	Joe Bandel and Danny Slakey
Rare Plant Survey 1	March 7, and 8, 2022	Sunshine Lopez, Gabby Reta, and Jessica Chavez
Ornduff's Meadowfoam Site Visit	April 15, 2022	Danny Slakey,

After the conclusion of field studies, the biologists identified the location, composition, and extent of plant communities and wildlife habitats in the BSA.

2.3.1 Special-Status Plant Surveys

Preliminary database searches, including CNPS queries, were used to gather background information on the potential for special-status plant species to occur. Although field surveys were conducted to map vegetation, the initial vegetation survey in September 2021 did not correspond to species blooming periods. For this reason, focused botanical

surveys began in March of 2022, with further surveys planned for late spring and summer. The March surveys was conducted by AECOM biologists Sunshine Lopez and Gabby Reta and Caltrans biologist Jessica Chavez.

2.3.2 Aquatic Resource Jurisdictional Delineation

The aquatic resource jurisdictional delineation was conducted on September 7, 8, and 15, 2021, by AECOM biologists Joe Bandel and Danny Slakey. The riverine aquatic resources were delineated—using the USACE guidance, *A Guide to Ordinary High Water Mark Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (USACE 2014)—to determine the extent of WOTUS. Potential USACE jurisdictional wetlands were evaluated for the three-parameter definition (hydrophytic vegetation, hydric soils, and wetland hydrology) of a USACE jurisdictional wetland. In addition, wetlands were evaluated to determine whether they meet the CCC definition of a wetland (just one of the three parameters), due to the location's presence in the California Coastal Zone.

2.3.3 Special-Status Wildlife Studies

Preliminary technical studies were conducted to evaluate the potential for listed wildlife species to occur in the BSA. This investigation included review of aerial imagery, CNDDB searches, USFWS and NMFS species lists (Appendix B), and other technical reports and resources to characterize the potential for distribution and relative abundance of listed wildlife and associated habitats. AECOM biologists conducted walking surveys in the field to determine the habitat conditions where wetlands and waters could occur in the BSA, as reported in the Aquatic Resources Delineation Report prepared for the project; and conducted remote satellite imagery surveys to determine special-status wildlife species with potential to occur in the BSA. Determinations were based on the existence of known occurrences and dates of those occurrences, habitat quality, and proximity to development and highways. Protocol-level surveys for protected species were not conducted.

2.4 Agency Coordination and Professional Contacts

On July 20, 2021, Jessica Chavez spoke to Elena Meza (NMFS) over the phone for technical assistance.

On July 28, 2021, Jessica Chavez spoke to Meghan Bishop (USFWS) over the phone for technical assistance.

2.5 Limitations that May Influence Results

Some portions of the BSA were inaccessible during site visits. Heavy traffic on SR 1 and a lack of safe parking prevented access to some areas adjacent to the highway. Any inaccessible areas were closely examined on Google Maps, and a conservative approach was taken when determining whether they may provide habitat for special-status species and other sensitive natural resources. No protocol-level wildlife surveys for special-status species were conducted. The presence of California red-legged frog and San Francisco garter snake were inferred due to the presence of nearby riparian and aquatic resources, suitable dispersal habitat, and nearby CNDDB occurrences. Rare plant surveys were conducted at a reconnaissance level, and protocol-level

surveys were not performed. For inaccessible sites, the areas were examined later from Google Maps street and aerial views.

Chapter 3: Results: Environmental Setting

3.1 Description of the Existing Physical and Biological Conditions

The project is in the Santa Cruz Mountains ecological subsection of the Central California Coast Ecological Section (Miles and Goudey 1998). The subsection extends from Pacifica to Santa Cruz along the California coast, and inland to include the western and southwestern parts of the Santa Cruz Mountains.

The BSA includes paved and compacted areas of HWY 1 and potential habitat directly adjacent to the roadway within Caltrans right of way. The existing roadway in the BSA consists of a conventional highway with one lane in each direction, with 12-foot lanes. SR 1 along this corridor is subject to heavy traffic, as a result there are high levels of noise and vibrational baseline disturbance.

3.1.1 Biological Study Area

The project consists of improvements in and north of the City of Half Moon Bay in San Mateo County, California. The project is on SR 1 between PM 27.5 and PM 34.8; and SR 92 at PM 0.2. The BSA consists of the project footprint (permanent or temporary impact areas, including staging and access areas), along with buffer areas (surrounding the project footprint) that construction activities may directly or indirectly impact. The buffer areas were estimated based on the potential for project activities to cause noise, water quality, or geomorphological impacts. The BSA totals approximately 155 acres and is shown in Appendix A.

3.1.2 Physical Conditions

3.1.2.1 Climate

As part of the Santa Cruz Mountains, the region generally experiences a Mediterranean climate, moderated by the Pacific Ocean marine layer that is responsible for the regular fog conditions along the north-central California coast. Cooler temperatures predominate in winter between November and March, and the warmest temperatures typically occur during late summer.

Westerly precipitation systems deliver rain to the watershed generally between November and April. In contrast, little to no rainfall occurs between late spring through early fall, which is commonly referred to as the dry season. The majority of rain delivered to the watershed falls on west-facing slopes of relatively high relief, where higher elevation areas receive up to 35 inches and lower areas receive 26 inches (Rantz 1971). Typically, a few large winter storms generate high flow events and increased sediment input to streams each year.

The highest average temperature in Half Moon Bay is 64.6 degrees Fahrenheit (°F) from May through October, and the lowest average temperature is 42.6°F from November through April. The City of Half Moon Bay is approximately 75 feet above mean sea level.

3.1.2.2 Soils

Soil types in the BSA were identified based on information received from the Natural Resources Conservation Service Web Soil Survey (NRCS 2021). Soil composition varies throughout the BSA and includes several types shown in Appendix C (Figure B-1) and discussed in the following paragraphs.

- **Botella** series soils consist of nearly level to gently sloping, dark-colored, well-drained to imperfectly drained soils on older floodplains where there are deeply entrenched streams. These soils have formed mainly from material washed from sedimentary rocks. In some areas, the material contains small amounts of sediments derived from basic igneous rocks. Botella soils occur throughout San Mateo in small alluvial valleys and on gently sloping benches, terraces, and fans. Most of them occur at elevations ranging from near sea level to a few hundred feet. The surface soil is thick, very dark gray, slightly acid, and strongly granular loam, clay loam, or shaly loam.

- **Denison** series soils consist of nearly level to sloping, dark-colored, moderately well drained to imperfectly drained soils on low terraces. These soils have formed under grass vegetation from granitic alluvium. They occur along the coast north of Half Moon Bay at elevations ranging from about 10 to 50 feet. They are associated with the Farallone, Miramar, and Elkhorn soils. The surface soil, which is black and medium acid or slightly acid, has a wide range in texture, including coarse sandy loam, loam, and clay loam. The subsoil is also black and exhibits mottling. The subsoil is neutral to slightly acid, heavy sandy clay loam or clay that is extremely hard when dry and has a strong, prismatic structure. Most of the Denison soils are used for growing Brussels sprouts, artichokes, cabbage, and flowers. Small grains and flax also are grown, and in a few places the soils are used for irrigated pasture.

- **Farallone** series soils consist of well-drained, nearly level to moderately steep soils on recent fans and flood plains. These soils have formed in alluvium that was derived mainly from granitic rocks. The vegetation in uncultivated areas is mainly coyote brush and bush lupines. The Farallone soils are north of Half Moon Bay in narrow valleys that extend into the hills, and on fans that extend outward from these valleys. They are associated with Denison and Miramar soils. The elevation is mostly below 200 feet. The surface soil is a dark-gray granular loamy coarse sand, coarse sandy loam, or loam that is slightly hard when dry. The subsoil in most places is moderately coarse-textured, stratified, slightly hard when dry, and has weak subangular blocky structure. The underlying material, which is many feet thick, consists of massive, stratified layers of sandy loam and coarse sandy loam. The profiles are slightly acid throughout. Most of the Farallone soils are cultivated and are used for flowers, truck crops, and irrigated pasture.

- **Gullied land** (alluvial soil material) occurs near streams that extend through areas of Botella, Farallone, and Soquel soils. Relief along these streams ranges

from gently sloping to sloping. The areas are usually well vegetated by woody plants.

- **Urban land soils** are soils that have been changed in some way by humans. They are often transported by truck to create the base for roads for transportation projects. They are commonly referred to as “fill.”

- **Watsonville** series soils have a dense claypan subsoil that is underlain by marine sediments. The soils are moderately well drained to imperfectly drained. They have formed in alluvium that was derived principally from sedimentary rocks and from higher-lying upland soils. The Watsonville soils are on nearly level to steep terraces between Half Moon Bay and the southern tip of San Mateo County. They are generally found within 1 mile of the ocean. The surface layer is dark gray, granular, slightly hard to hard when dry, and medium to strongly acid. The texture of the surface soil is normally sandy loam, loam, or clay loam. The parent material consists of neutral, massive, very hard, somewhat stratified layers of predominantly sandy loam texture. The Watsonville soils are typically used for agriculture.

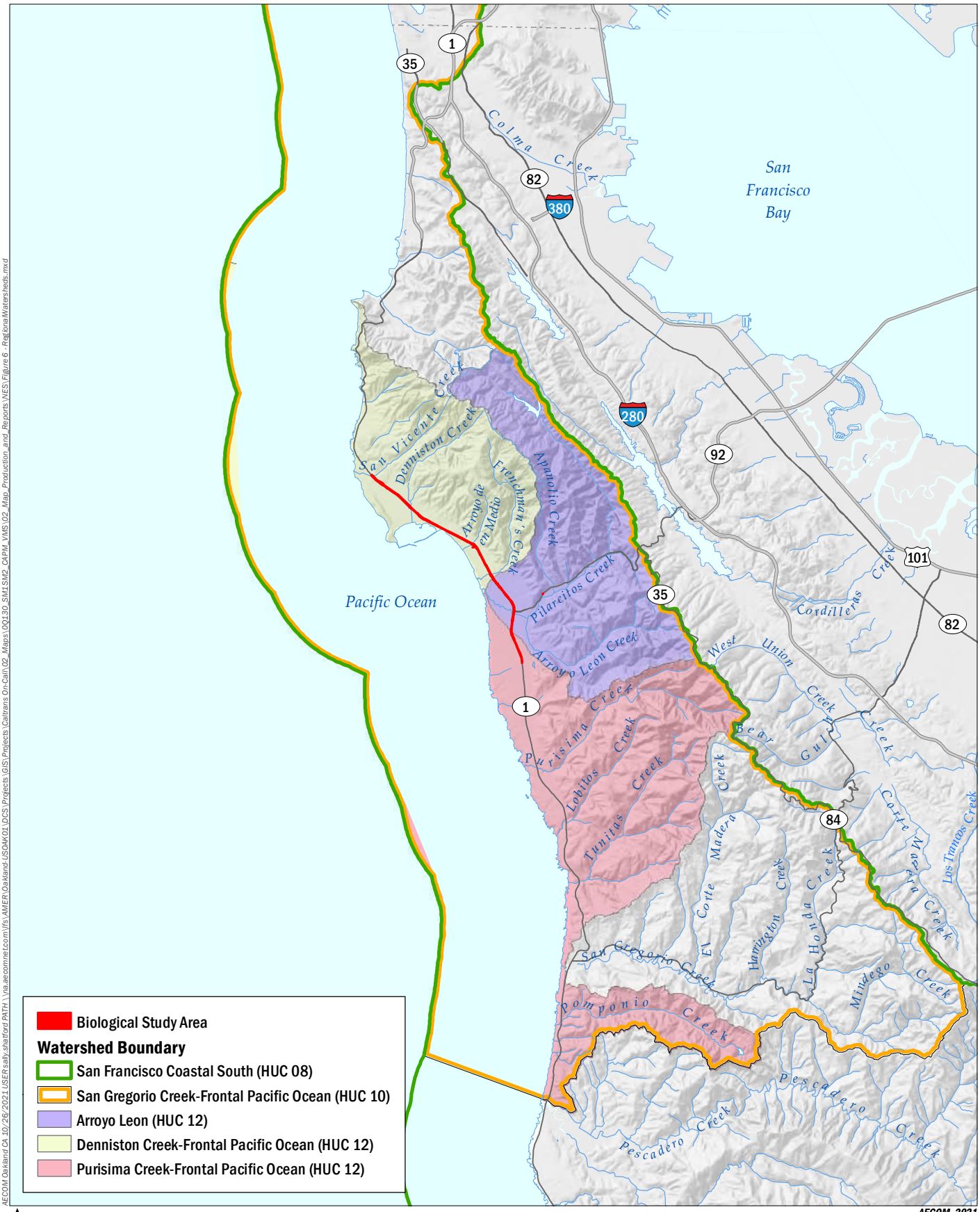
3.1.2.3 Hydrology

Situated on the westernmost portion of the San Francisco Peninsula, the BSA is in the San Francisco Coastal South Hydrologic Unit Code (HUC) 8 Watershed and the San Gregorio Creek-Frontal Pacific Ocean HUC 10 Watershed. The BSA spans three HUC 12 watersheds: Denniston Creek-Frontal Pacific Ocean, Arroyo Leon, and Purisima Creek-Frontal Ocean (Figure 3-1). All the creeks in the area drain in a west-southwest direction, coming from the western slope of the Santa Cruz Mountains. The named drainages that cross the BSA are Denniston Creek, Deer Creek, Arroyo de en Medio, Frenchman’s Creek, and Pilarcitos Creek (Figure 3-1). Of these, Pilarcitos Creek is the largest; the remaining creeks have a watershed size of less than 5 square miles.

Pilarcitos Creek originates on the eastern side of Montara Mountain and flows about 12 miles to the Pacific Ocean at Half Moon Bay. It drains a watershed of approximately 17,900 acres (28 square miles) in San Mateo County. The creek, a source of drinking water for residents of the central coast and San Francisco Bay Area, is diverted at the Pilarcitos Reservoir and Stone Dam complex in the upper watershed. Denniston Creek, Arroyo de en Medio, and Frenchman’s Creek are similar to Pilarcitos Creek in that they all originate from the slopes of Montara Mountain and eventually flow west to the Pacific Ocean; however, they are not sources of drinking water.

3.1.3 Biological Conditions

The following section describes the biological conditions in the BSA and impact area.



AECOM Oakland CA 10/26/2021 \\SER sally.shatford PATH: \\na.aecomnet.com\ifs\AMER\Oakland-USOAK01\DCS\Projects\GIS\Projects\Caltrans On-Call\02_Maps\00130_SM1SM2_CAPM_VMS\02_Map_Production_and_Reports\NES\Figure 6 - RegionalWatersheds.mxd

AECOM, 2021
ESRI Basemap, 2016
USGS WBD, 2020

AECOM

Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

FIGURE 3-1

Regional Watersheds and Drainages

3.1.3.1 Vegetation

Vegetation was mapped and described based on field surveys at water crossings and areas subject to off-pavement disturbance. In all other parts of the BSA, vegetation was mapped using a combination of aerial imagery and street view imagery. Vegetation was mapped to the vegetation alliance level using the CNPS *Manual of California Vegetation* (CNPS 2021) classification system where possible. For vegetation communities that could be consistently identified to the association level throughout the BSA, the vegetation association was also recorded in the vegetation habitat descriptions.

The presence of invasive species, defined as those included on the Cal-IPC (2021) inventory of invasive plants, was noted for vegetation communities on the field surveys. Additional nonnative species that are not ranked by Cal-IPC (2021) but appeared to be problematic invasive species in the BSA are also discussed in the community descriptions, where applicable. Cal-IPC's (2021) invasive plant rankings are defined as follows:

- High: species with severe ecological impacts
- Moderate: substantial and apparent, but not severe, ecological impacts
- Limited: minor ecological impacts, or impacts for which information is limited
- Watch: at a high risk of becoming invasive in the future

Vegetation communities are summarized in Table 3-1 and described in detail in this section. Appendix D includes vegetation mapping completed for the project. Vegetation community descriptions include the vegetation alliance name, association name (when a single association from that alliance is present in the BSA), description of dominant and associated species, description of abundant and noteworthy invasive species in the community, and the community's global (G) and state (S) rankings. Communities with ranks S1 through S3 are considered sensitive natural communities (CDFW 2021).

Duckweed Blooms

Duckweed blooms occur in the BSA at a single site along northbound SR 1. This area has a small patch of standing water, with cover consisting only of duckweed (*Lemna* sp.). The duckweed was not identified to the species level, but all members of this genus occurring in California are considered native (Calflora 2021). No invasive species are present in this community. The duckweed bloom in the BSA is surrounded by seasonal herbaceous wetland. This community is ranked *G5S4?*.

Seasonal Herbaceous Wetland

Seasonal herbaceous wetlands in the BSA could not be identified to the vegetation alliance level in CNPS (2021) due to this community's poor fit for previously described vegetation alliances. These wetlands have relatively sparse vegetative cover with several codominant species, including tall cyperus (*Cyperus eragrostis*), bristly ox-tongue (*Helminthotheca echioides*; Cal-IPC limited), curly dock (*Rumex crispus*; Cal-IPC limited), willow dock (*Rumex transitorius*), and Pacific aster (*Symphyotrichum chilense*). Only invasive species ranked as limited by Cal-IPC were observed in this community. Because this community cannot be assigned to an alliance in the *Manual of California Vegetation* (CNPS 2021), it does not have a G or S rank.

Herbaceous Wetland Plant Communities

Water Parsley Marsh

Water parsley marsh occurs at a single wetland in the BSA. This community is dominated by water parsley (*Oenanthe sarmentosa*) and dotted smartweed (*Persicaria punctata*), with few other species present. Invasive plant species present in this community include garden nasturtium (*Tropaeolum majus*) and English ivy (*Hedera helix*; Cal-IPC high). Garden nasturtium is not a Cal-IPC-rated invasive plant, but it can invade shaded or moist areas (Calflora 2021) and is dominant on the edges of this habitat. Water parsley marsh is ranked *G4S2?*, making it a sensitive natural community.

Table 3-1 Natural Communities Present in the *Biological Study Area*

Community Type	Common Name	Scientific Name	Ranking[1,2]
Herbaceous wetland communities	Duckweed blooms	Lemna (minor) and relatives	G5S4?
	Seasonal herbaceous wetland	—	—
	Water parsley marsh	Oenanthe sarmentosa	G4S2?
Herbaceous upland communities	Ice plant mats	Mesembryanthemum spp. – Carpobrotus spp.	GNASNA
	Poison hemlock or fennel patches	Conium maculatum – Foeniculum vulgare	GNASNA
	Upland mustards or star thistle fields	Brassica nigra – Centaurea (solstitialis, melitensis)	GNASNA
	Wild oats and annual brome grasslands	Avena spp. – Bromus spp.	GNASNA
Shrub-dominated communities	Arroyo willow thicket	Salix lasiolepis	G4S4
	California coffee berry – western azalea – Brewer's willow scrub	Frangula californica – Rhododendron occidentale – Salix breweri	G3S3
	California sagebrush – (purple sage) scrub	Artemisia californica – (Salvia leucophylla)	G5S5
	Coyote brush scrub	Baccharis pilularis	G5S5
	Himalayan blackberry – rattlebox – edible fig riparian scrub	Rubus armeniacus – Sesbania punicea – Ficus carica	GNRSNR
	Poison oak scrub	Toxicodendron diversilobum	G4S4
	Salal – berry brambles	Gaultheria shallon – Rubus (ursinus)	GNRS4
Tree-dominated communities	Acacia woodland3	Acacia spp. – Grevillea spp. – Leptospermum laevigatum (pending)	—
	Eucalyptus – tree of heaven – black locust groves	Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia	GNASNA
	Goodding's willow – red willow riparian woodland and forest	Salix gooddingii – Salix laevigata	G4S3
	Monterey cypress – Monterey pine stands	Hesperocyparis macrocarpa – Pinus radiata	GNASNA
	Red alder forest	Alnus rubra	G5S4
Developed communities and unvegetated areas	Agricultural cropland	—	—
	Landscaped areas	—	—
	Urban	—	—

Notes:

[1] Community rankings are defined by NatureServe (2021) as follows, with the rankings applying to the community's status globally (G rank) and in the state of California (S Rank):
1: critically imperiled
2: imperiled
3: vulnerable
4: apparently secure
5: secure
NA: not assessed
NR: not ranked
?: inexact numeric rank (not enough information)
Communities with "—" in the Ranking column have no ranking because they are not recognized by CNPS (2021).

[2] Communities with S Rankings between S1 and S3 are considered sensitive natural communities.

[3] Acacia woodland does not have a G or S ranking because it is pending inclusion in the *Manual of California Vegetation* (CNPS 2021). It will not be ranked as a sensitive natural community because it is dominated by nonnative species.

Herbaceous Upland Plant Communities

Ice Plant Mats

Ice plant mats occur in small patches at several locations in the BSA. This community is dominated by ice plant (*Carpobrotus edulis*; Cal-IPC high). Few other species occur in this community, apart from a few nonnative annual grasses that are also present in the wild oat (*Avena fatua*) and annual brome grasslands community. Although ice plant is an invasive species of concern, this plant is relatively uncommon throughout the BSA and only forms relatively small patches. This community is ranked *GNASNA*.

Poison Hemlock or Fennel Patches

Poison hemlock or fennel patches occur in disturbed areas throughout the BSA, both in uplands and at the margins of wetlands. Most of this community in the BSA is dominated by poison hemlock (*Conium maculatum*; Cal-IPC moderate), but there are several patches that are dominated by fennel (*Foeniculum vulgare*; Cal-IPC moderate). Nonnative annual grasses found in the wild oats and annual brome grasslands community are also present at moderate cover. This community intergrades with the other disturbed herbaceous communities described in this section. This community is ranked *GNASNA*.

Upland Mustards or Star Thistle Fields

In the BSA, this community is represented by upland mustards exclusively; no star thistle (*Centaurea* spp.) plants were observed in the BSA. This community is dominated by black mustard (*Brassica nigra*; Cal-IPC moderate), hoary mustard (*Hirschfeldia incana*; Cal-IPC moderate), and in some areas jointed charlock (*Raphanus sativus*; Cal-IPC limited). This community also has a moderate cover of nonnative annual grasses that are more dominant in the wild oats and annual brome grasslands community. This community intergrades with the other disturbed herbaceous communities described in this section. This community is ranked *GNASNA*.

Wild Oats and Annual Brome Grasslands

Wild oat and annual brome grasslands are the most common plant community found in the BSA, occupying the bulk of the land cover in areas lacking trees, shrubs, or pavement. This community is dominated by nonnative grasses, including slender oat (*Avena barbata*; Cal-IPC moderate), rescue grass (*Bromus catharticus*), soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis*), Italian ryegrass (*Festuca perennis*; Cal-IPC moderate), velvet grass (*Holcus lanatus*; Cal-IPC moderate), kikuyu grass (*Pennisetum clandestinum*; Cal-IPC limited), and Harding grass (*Phalaris aquatica*; Cal-IPC moderate). Several nonnative forbs are also associated with this community, including bristly ox-tongue (Cal-IPC limited), flax (*Linum bienne*), annual mercury (*Mercurialis annua*), ribwort (*Plantago lanceolata*; Cal-IPC limited), and pincushions (*Scabiosa atropurpurea*; Cal-IPC watch). Cover of pincushions is dense in sections of the BSA, but there are few records of this species from coastal San Mateo County (Jepson Flora Project 2021). A few native species, such as salt grass (*Distichlis spicata*), willow herb (*Epilobium brachycarpum*), California poppy (*Eschscholzia californica*), and coastal tarweed (*Madia sativa*), are present at low cover in the

grasslands. Andean pampas grass (*Cortaderia jubata*; Cal-IPC high) occurs in several small patches throughout the grasslands, but in areas too small to be mapped as a separate vegetation community. The grasslands in the BSA intergrade with the other disturbed herbaceous communities in the BSA, and these communities have many of the same invasive species in common. This community is ranked *GNASNA*.

Shrub-Dominated Plant Communities

Arroyo Willow Thickets

Arroyo willow thickets occur in mesic sites throughout the BSA, including riparian areas and roadside ditches. This community is dominated by arroyo willow (*Salix lasiolepis*) and has a shrub/vine layer in places that includes California blackberry (*Rubus ursinus*), California coffee berry (*Frangula californica*), coyote brush (*Baccharis pilularis*), American dogwood (*Cornus sericea*), and red elderberry (*Sambucus racemosa*). Understory plants are present mostly on the margins of this community, and include Pacific aster, yarrow (*Achillea millefolium*), mugwort (*Artemisia douglasiana*), coast rush (*Juncus hesperius*), and spreading rush (*Juncus patens*). Arroyo willow thickets in the BSA generally have a very dense cover of native woody species, with few invasive species present; but on their edges, this community intergrades with grasslands and other disturbed herbaceous communities. The edges of the arroyo willow thickets therefore have a low density of the same invasive species found in the disturbed herbaceous communities, such as poison hemlock, fennel, Andean pampas grass, hoary mustard, black mustard, and nonnative annual grasses. This community is ranked *G4S4*.

California Coffee Berry – Western Azalea – Brewer's Willow Scrub

California coffee berry – western azalea – Brewer's willow scrub occurs in only two small patches in the BSA, and only the California coffee berry association is present in the BSA. This community is dominated by California coffee berry, with no other shrubs present. There is little to no understory in this community, owing to the very dense cover of California coffee berry shrubs. This community is ranked *G3S3*, making it a sensitive natural community.

California Sagebrush – (Purple Sage) Scrub

California sagebrush – (purple sage) scrub occurs in a single patch in the BSA, and is represented by the California sagebrush association. This community is dominated by California sagebrush (*Artemisia californica*), with no co-occurring shrubs; it is associated with nonnative annual grasses. No invasive species were identified in this community, although it is expected that some nonnative annual grasses ranked limited or moderate by Cal-IPC (2021) are likely present. California sagebrush – (purple sage) scrub is ranked *G5S5*.

Coyote Brush Scrub

Coyote brush scrub is found in several locations throughout the BSA. This community is dominated by coyote brush, including both upright (var. *pilularis*) and prostrate (var. *consanguinea*) forms, and is associated with several native shrubs and herbs, including

California coffee berry, California blackberry, poison oak (*Toxicodendron diversilobum*), California bee plant (*Scrophularia californica*), Pacific aster, and spreading rush. Most coyote brush scrub vegetation in the BSA has few invasive species, but some invasive plants are present on its peripheries, particularly poison hemlock (Cal-IPC moderate). Coyote brush scrub is ranked *G5S5*.

Himalayan Blackberry – Rattlebox – Edible Fig Riparian Scrub

Himalayan blackberry – rattlebox – edible fig riparian scrub occurs in a single patch in a roadside ditch along the northbound side of SR 1, and only the Himalayan blackberry association is present in the BSA. Although this community is not in a riparian zone, the site is likely more mesic than surrounding grasslands due to its location in a ditch. This community is dominated by Himalayan blackberry (*Rubus armeniacus*; Cal-IPC high) and is associated with coyote brush and nonnative annual grasses. This area is mowed on a regular basis, so the Himalayan blackberry and coyote brush only grow very close to the ground; if mowing were to cease, these plants would likely form a dense thicket in this area. The mowing may help to slow the spread of the invasive Himalayan blackberry both by preventing seed set and slowing down its spread via vegetative growth. This community is ranked *GNRSNR*.

Poison Oak Scrub

Poison oak scrub occurs in the BSA only at the location along SR 92. This community is dominated by poison oak and is associated with California blackberry and California bee plant. Although this community has a very high cover of native shrubs, it has a small infestation of Andean pampas grass (Cal-IPC high). Poison oak scrub is ranked *G4S4*.

Salal – Berry Brambles

Salal – berry brambles occur in a few patches in the BSA, at a mesic site along a ditch and in riparian areas; this community is represented by the California blackberry association in the BSA. Salal – berry brambles in the BSA are dominated by California blackberry and are associated with common horsetail (*Equisetum arvense*), stinging nettle (*Urtica dioica*), and Pacific aster. Some nonnative annual grasses are found in this community. This community is ranked *GNRS4*.

Tree-Dominated Plant Communities

Acacia Woodland

Acacia woodlands occur in the BSA in the riparian zone at Arroyo de en Medio. This community is dominated by a canopy of blackwood acacia (*Acacia melanoxylon*; Cal-IPC limited) and several red elderberry shrubs, with an understory dominated by invasive plants, including garden nasturtium, English ivy (Cal-IPC high), Cape ivy (*Delairea odorata*; Cal-IPC high), and upright veldt grass (*Ehrharta erecta*; Cal-IPC moderate). Some large blue gum (*Eucalyptus globulus*) trees had recently dominated the tree canopy but were cut shortly before the survey, resulting in these areas being mapped as acacia woodlands.

Eucalyptus – Tree of Heaven – Black Locust Groves

Eucalyptus – tree of heaven – black locust groves are found in several riparian and upland areas throughout the BSA and are represented in the BSA by the eucalyptus association. This community is dominated by blue gum (Cal-IPC limited) trees, many of which are mature, large specimens. Smaller trees and shrubs are present below the blue gum canopy, including blackwood acacia and red elderberry. Understories in this community are like those found in acacia woodlands, and are dominated by garden nasturtium, English ivy (Cal-IPC high), and Cape ivy (Cal-IPC high), with some upright veldt grass also present. This community is ranked *GNASNA*.

Goodding's Willow – Red Willow Riparian Woodland and Forest

Goodding's willow – red willow riparian forest and woodland occurs in the BSA only at Frenchman's Creek, and is represented in the BSA by the red willow association. This community is dominated by red willow (*Salix laevigata*) and is surrounded by a eucalyptus grove. The understory includes a mix of natives and nonnative species, including red elderberry, California blackberry, stinging nettle, English ivy (Cal-IPC high), and Cape ivy (Cal-IPC high). This community is ranked *G4S3*, making it a sensitive natural community.

Monterey Cypress – Monterey Pine Stands

Monterey cypress – Monterey pine stands occur in upland areas throughout the BSA. Monterey cypress (*Hesperocyparis macrocarpa*) is the dominant tree in this community, but several Monterey pine (*Pinus radiata*) trees are present in low numbers in parts of the BSA. Due to the dense canopies of Monterey cypress trees and their tendency to form low-growing branches, this community generally has a very sparse understory, with few species. In areas where the lowest branches have been trimmed, nonnative annual grasses tend to dominate the understory. Monterey cypress and Monterey pine were either planted or naturalized throughout the BSA because their native ranges are restricted to the vicinity of the Monterey Peninsula. This community is ranked *GNASNA*.

Red Alder Forest

Red alder forest is found in the BSA only in the riparian area at Pilarcitos Creek. This community is dominated by red alder (*Alnus rubra*) and is associated with arroyo willow, Pacific willow (*Salix lasiandra*), and California blackberry. Invasive species were not observed in this community but may be present in the understory because this community was only observed from the elevated roadway. This community is ranked *G5S4*.

Developed Plant Communities and Unvegetated Areas

Agricultural Cropland

Agricultural cropland in the BSA consists of areas managed for annual herbaceous crops. Those observed at the time of survey include Brussels sprouts (*Brassica oleracea* 'gemmifera) and field pumpkin (*Cucurbita pepo*), with a sparse cover of nonnative annual grasses in some areas of cropland. Agricultural cropland in the BSA is known to support the only known population of Ornduff's meadowfoam (*Limnanthes*

douglasii ssp. *ornduffii*) (California Rare Plant Rank [CRPR] 1B.1; CDFW 2021), and the population extends into the BSA, as determined during March 2022 rare plant surveys (see Section 2.3.1). Poor drainage of the agricultural croplands in the BSA may contribute to the mesic conditions associated with this Ornduff's meadowfoam population.

Landscaped Areas

Landscaped areas in the BSA include areas dominated by trees, shrubs, and herbaceous plants. This community was mapped in areas dominated by nonnative plants that could not be assigned to another community, as well as in areas dominated by California native plants that were obviously planted and may not be native to the immediate vicinity of the BSA. Common plants in landscaped areas of the BSA include silktree (*Albizia julibrissin*), ornamental pines (*Pinus* sp.), prickly pear (*Opuntia ficus-indica*), aloes (*Aloe* sp.), and several natives, including deergrass (*Muhlenbergia rigens*), California lilac (*Ceanothus* sp.), and California fuchsia (*Epilobium canum*). Although landscaped areas are dominated by nonnative species, few of the species in these areas are considered invasive. Some of the common invasive annual grasses and forbs present in the wild oats and annual brome grasslands are present in low densities in landscaped areas.

Urban

Urban land cover in the BSA consists of paved and graveled roads, riprapped shoreline areas, buildings, and other human-built structures. Few plant species are present in these areas.

3.1.3.2 Wildlife

Common wildlife species that may occur in or use the habitat in the BSA include relatively disturbance-tolerant species, such as western fence lizard (*Sceloporus occidentalis*), black phoebe (*Sayornis nigricans*), western scrub jay (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), house finch (*Carpodacus mexicanus*), western gull (*Larus occidentalis*), turkey vulture (*Cathartes aura*), white-crowned sparrow (*Zonotrichia leucophrys*), and cliff swallow (*Petrochelidon pyrrhonota*). Mammalian species dispersing or moving through the BSA may include California ground squirrel (*Otospermophilus beecheyi*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*).

Federal and state candidate, proposed, listed, or otherwise special-status species and habitats potentially occur in or disperse through the project footprint, according to database searches. The tables in Appendix E detail the requirements for each species or protected habitat and identify the likelihood that appropriate habitat occurs in the BSA.

Most species addressed in Appendix E are not expected to occur in the BSA, either because of a lack of suitable habitat, local range/elevation restrictions, regional extirpations, or lack of connectivity between areas of suitable or occupied habitat. Only those species having some potential to occur in the BSA are addressed further in

Chapter 4. The potential presence of a species does not imply that it will be impacted by the project. It merely notes species that warrant further analysis in Chapter 4:.

3.1.3.3 Habitat Connectivity

Wildlife movement corridors link areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. Urbanization and the resulting fragmentation of open space areas create isolated “islands” of wildlife habitat, forming separated populations. Creek corridors act as an effective link between populations in the BSA.

SR 1 acts as a potential barrier to terrestrial wildlife, such as California red-legged frog, in the project vicinity. That said, there is limited ecological incentive for California red-legged frog or San Francisco garter snake to be seeking habitats west of SR 1, given the proximity to the ocean. Creek corridors throughout the project footprint may act as an effective link for some populations. Urban land throughout the BSA may serve as a barrier to habitat connectivity.

3.1.3.4 Regional Species and Habitats and Natural Communities of Concern

The BSA overlaps with a portion of the only known population of Ornduff’s Meadowfoam. Potential impacts to this species are discussed in Section 4.4.1. The following sensitive natural communities occur within the BSA:

- Water Parsley Marsh
- California Coffee Berry – Western Azalea – Brewer's Willow Scrub
- Goodding’s Willow – Red Willow Riparian Woodland and Forest

The potential for these sensitive natural communities to be impacted by the proposed project is discussed in Section 4.2

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

This chapter identifies impacts to natural communities of special concern and special-status species that could be affected by implementation of the project. Avoidance and minimization measures (AMMs) for those individual resources are listed in each resources' subsection and are additional to the project features described in Chapter 1: The CNDDB search results for special-status animals and plants are displayed on Figure 4-1 and Figure 4-2, respectively.

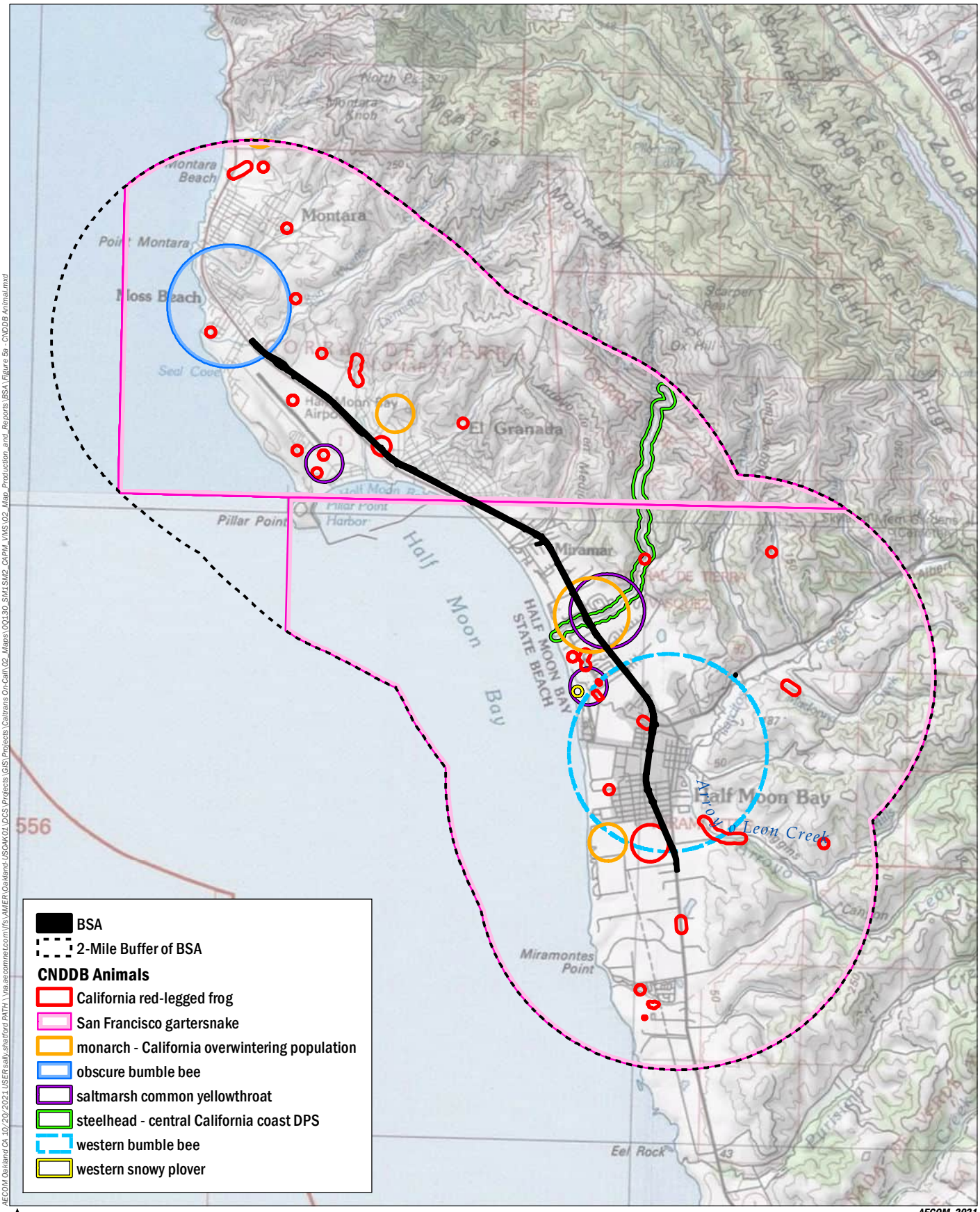
Federally and State-Listed Species

- Coho salmon-Central California Coast ESU (*Oncorhynchus kisutch*): federally endangered (FE), state endangered (SE)
- Steelhead-Central California Coast DPS (*Oncorhynchus mykiss irideus*): Federally threatened (FT)
- California red-legged frog (*Rana draytonii*): FE, state species of special concern
- San Francisco garter snake (*Thamnophis sirtalis tetrataenia*): FE, SE, and State fully protected

Special-Status and Locally Rare Species

The following plant and wildlife species with potential to occur in the BSA are not federally or state listed, but are identified by CDFW as Species of Special Concern:

- Ornduff's meadowfoam CRPR Rank 1B.1 (plants that are rare, threatened, or endangered in California and elsewhere; seriously threatened in California)
- Protected and migratory birds: MBTA



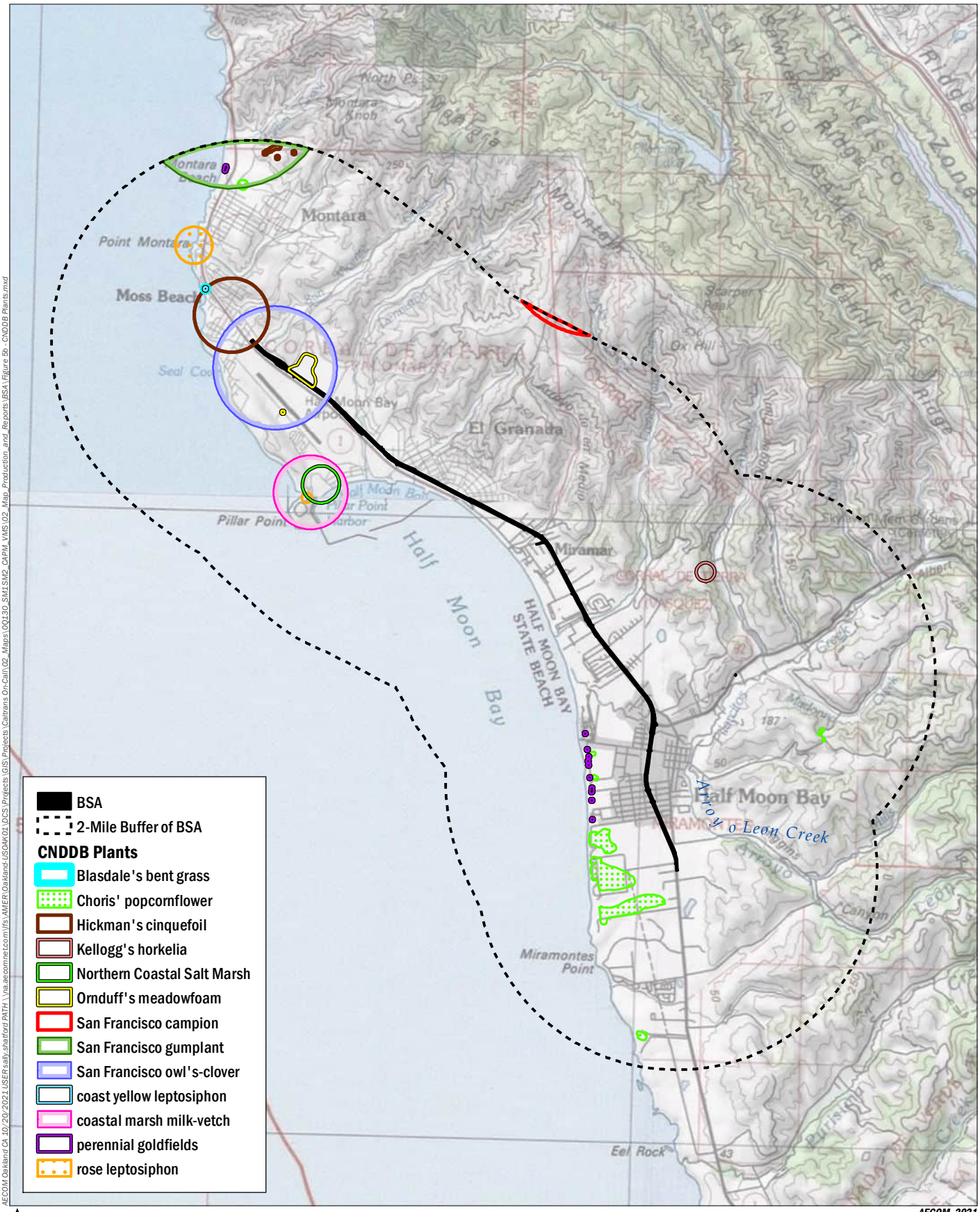
AECOM

Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

FIGURE 4-1

CNDDB Animal Occurrences



AECOM

Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

FIGURE 4-2

CNDDB Plant Occurrences

4.1 Definition of Effects

Impacts, or effects, are defined in 50 CFR Section 402.17. A final rule was adopted on September 26, 2019, that defines “effects” as “all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action.” This covers language used in previous versions of 50 CFR Part 402, in which “effects” included the use of the terms “direct,” “indirect,” “interrelated,” and “interdependent.” The intent of the change was to simplify the definition, and those terms may still be used to describe effects.

4.2 Habitats and Natural Communities of Special Concern

Habitats are of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special-status plants or animals occurring on site. Wetlands (including the sensitive natural community water parsley marsh), waters, and riparian habitat are the only special-status communities in the BSA that would be impacted by the project, as discussed in Section 4.3. The other sensitive natural communities described in Section 3.1.3 (Goodding’s willow – red willow riparian woodland and forest, and California coffee berry – western azalea – Brewer's willow scrub) would not be impacted by the project and thus are not discussed further.

4.2.1 Survey Results

A small area (0.003 acre) of water parsley marsh located near PM 31 (see Appendix C, Figure B-1, page 9) would be temporarily impacted by project activities. This sensitive natural community is expected to fully recover following the completion of project activities. This feature is also considered waters of the state and included in the survey results and impacts described in Section 4.3.

4.3 Wetlands and Waters of the United States and State, and Coastal Commission Riparian Habitat

Natural communities of concern that are known to occur in the BSA include jurisdictional WOTUS and waters of the state (WOS), and riparian habitat and wetlands regulated by the CCC.

4.3.1 Survey Results

Approximately 4.834 acres of aquatic resources were delineated in the BSA. Of those aquatic resources, 0.448 acre was delineated as WOTUS (Table 4-1).

This included wetlands and other waters delineated that are potentially subject to USACE jurisdiction under CWA Section 404, but also jurisdictional to the state agencies. Approximately 4.386 acres of these aquatic resources are not likely subject to

USACE jurisdiction, but are potentially within state jurisdictions held by CCC, RWQCB, and/or CDFW (Table 4-2).

Approximately 576 linear feet of culverted waters of the United States (Table 4-1); and 841 linear feet of culverted waters of the state were also delineated and mapped only in linear feet and not acreage (Table 4-2).

Table 4-1 Jurisdictional Status of Aquatic Resources in Waters of the United States in the Biological Study Area

Feature Type	Federal and State Agencies with Jurisdiction	Potential Applicable Federal and State Laws	Length (feet)[1]	Delineated Area (acres)[2]
WWUS	USACE, RWQCB, CCC	CWA Sections 404 and 401; CCA	86	0.009
OWUS	USACE, RWQCB, CDFW, CCC	CWA Sections 404 and 401; CCA, CFGC 1602	1,338	0.439
CWUS	USACE, RWQCB, CDFW	CWA Sections 404 and 401; CCA, CFGC 1602	576	—
Total WOTUS			**2,000**	**0.448**

Notes:

1. Linear feet are rounded to the nearest foot.
2. Acres are rounded to the nearest thousandth of an acre.

CCA = Coastal Commission Act
CCC = California Coastal Commission
CDFW = California Department of Fish and Wildlife
CFGC = California Fish and Game Code
CWA = Clean Water Act
CWUS = culverted waters of the United States
FGC = Fish and Game Code
OWUS = other waters of the United States
RWQCB = Regional Water Quality Control Board
USACE = United States Army Corps of Engineers
WOTUS = waters of the United States
WWUS = wetlands of the United States

Table 4-2 Jurisdictional Status of Aquatic Resources in Waters of the State in the Biological Study Area

Feature Type	Federal and State Agencies with Jurisdiction	Potential Applicable Federal and State Laws	Length (feet)[1]	Delineated Area (acres)[2]
CCW/Riparian Woodlands3	CCC, RWQCB, CDFW	CCA, CFGC 1602	—	4.300
OWOS	RWQCB	PCA	769	0.086
CWOS	RWQCB	PCA	841	—
Total waters of the State (includes WOTUS)			**3,610**	**4.386**

Notes:

1. Linear feet are rounded to the nearest foot.
2. Acres are rounded to the nearest thousandth of an acre.

[3] For this delineation, all CCW (non-WOTUS) also happened to occur in riparian woodlands. Because they had a predominance of hydrophytic vegetation, the riparian woodlands had at least one-parameter to constitute a CCW and are under the jurisdiction of RWQCB and CDFW.

CCA = Coastal Commission Act
CCC = California Coastal Commission
CCW = Coastal Commission Wetland
CDFW = California Department of Fish and Wildlife
CFGC = Fish and Game Code
CWOS = culverted waters of the state
OWOS = other waters of the state
PCA = Porter-Cologne Act
RWQCB = Regional Water Quality Control Board
WOTUS = waters of the United States

4.3.2 Project Impacts

Based on the design and location of the proposed project, construction activities have the potential to impact wetlands and waters directly and indirectly in the BSA, including a small area of water parsley marsh, a sensitive natural community. Potential temporary impacts to WOTUS and WOS include temporary access and work in the wetlands in the BSA for culvert replacement. Table 4-3 provides a summary of the impacts that would result to jurisdictional wetlands, waters, and other areas. Up to 0.003 acres of water parsley marsh would be temporarily impacted.

Permanent impacts to wetlands and waters would be avoided because the new drainage system elements would be rehabilitated entirely within the footprint of the existing elements. Potential impacts to WOTUS and WOS are shown, along with impacts to special-status species, in Appendix F.

Table 4-3 Impacts to Jurisdictional Waters and other Aquatic Resources in the Project Footprint

Feature Type	Federal and State Agencies with Jurisdiction	Potential Applicable Federal and State Laws	Permanent Impact Area (acres)[2]	Temporary Impact Area (acres)[2]
WWUS	USACE, RWQCB, CCC	CWA Sections 404 and 401; CCA	0	0.001
OWUS	USACE, RWQCB, CDFW, CCC	CWA Sections 404 and 401; CCA, CFGC 1602	0	0.020
CWUS	USACE, RWQCB, CDFW	CWA Sections 404 and 401; CCA, CFGC 1602	0	0.020
Total WOTUS			0	0.041
CCW/Riparian Woodlands3	CCC, RWQCB, CDFW	CCA, CFGC 1602	0.020	0.47
OWOS	RWQCB	PCA	0	0.03
CWOS	RWQCB	PCA	0	0.02
Total Waters of the State			**0.020**	**0.520**

Notes:

1. Linear feet are rounded to the nearest foot.
2. Acres are rounded to the nearest thousandth of an acre.
3. Includes 0.003 acres of temporary impact to water parsley marsh

CCA = Coastal Commission Act
CCC = California Coastal Commission
CDFW = California Department of Fish and Wildlife
CFGC = California Fish and Game Code
CWA = Clean Water Act
CWUS = culverted waters of the United States
FGC = Fish and Game Code
OWUS = other waters of the United States
RWQCB = Regional Water Quality Control Board
USACE = United States Army Corps of Engineers
WOTUS = waters of the United States
WWUS = wetlands of the United States

4.3.3 Avoidance and Minimization Efforts

The measures listed in the following paragraphs would be implemented as part of construction to minimize and/or avoid impacts to jurisdictional wetlands, waters, and riparian habitats in the BSA.

- **BIO-01: Wetlands and Waters Construction Work Windows.** Work in wetlands, waters, and riparian habitat will be limited to June 15 through October 15 to avoid or minimize impacts to WOTUS, WOS, riparian habitat, and special-status species habitat.

- **BIO-02: Environmentally Sensitive Areas.** Wetlands, waters, riparian habitat, designated critical habitat, and special-status species habitat will be delineated as ESAs on contract plans and defined in contract specifications. ESAs outside of the proposed work areas will be specifically identified to avoid during construction. Where work must occur in or adjacent to an ESA, an approved biologist with stop-work authority will be present.

- **BIO-03: ESA Fencing.** Caltrans will install fencing to outline and protect ESAs prior to the start of construction. ESA provisions will be implemented as a first order of work and remain in place until all construction activities are completed in the work area.

4.3.4 Construction Water Quality Control Best Management Practices

The BMPs listed in the following paragraphs would be implemented as part of construction to minimize and/or avoid impacts to jurisdictional wetlands, waters, and riparian habitats in the BSA.

- **Construction Discharges.** No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products, or other organic or earthen material shall be allowed to enter or be placed where it may be washed by rainfall or runoff into, drainages or WOTUS.

- **Uncured Concrete Grout.** Any concrete grout will be isolated from surface waters while curing. Caltrans will ensure that cure water does not flow to inlets or

water courses but rather to collection areas for infiltration or other means of removal in accordance with all applicable permits.

- **Maintenance and Fueling.** Maintenance and fueling of construction equipment and vehicles will occur no closer than 50 feet from ESAs. All equipment will be well maintained and free of leaks.

- **Erosion Control.** Temporary erosion control and slope stabilization BMPs such as those discussed in project feature 12 in Section 1.6 generally will be installed during the dry season (June 15 through October 15), or as appropriate during the wet season to address specific stormwater and erosion risks. Erosion control measures may include silt fencing, straw wattles, straw bales, coir blankets, sediment traps, and other protective measures to minimize the potential for erosion of sediment beyond the work area or degradation of water quality in adjacent aquatic habitats.

- **Stockpiles.** Excavated material will not be stored or stockpiled in wetlands, waters, or riparian areas. All excavated material from wetlands, waters, or riparian areas that will not be placed back in the channel or on the bank after construction will be disposed at a licensed upland facility.

- **Water Diversion Plan.** Caltrans will prepare a water diversion and dewatering plan and avoid any work in wetted creek channels.

4.3.5 Compensatory Mitigation

Caltrans does not propose any compensatory mitigation for temporary impacts to WOTUS and WOS because all work will rehabilitate existing drainage systems and would not result in new permanent impacts. Potential measures and mitigations to address stormwater impacts from new impervious surfaces will be determined during the project's final design and will be addressed under a separate analysis and in coordination with the RWQCB.

4.3.6 Cumulative Impacts

By incorporating the project features and AMMs described in this Natural Environment Study (NES), the proposed project will not contribute to substantial adverse cumulative impacts that are anticipated because of this project.

4.4 Special-Status Plant Species

There is currently one plant species that is known to or likely to occur in the BSA. Other special-status plant species were determined to have little or no potential to occur in the BSA (see Appendix E).

4.4.1 Ornduff's Meadowfoam

Ornduff's meadowfoam is an annual plant only known to occur the area between Half Moon Bay and Moss Beach. The species was initially identified in 1998 in an agricultural

field at that location. The core of this species' population grows densely over an area of approximately 18 acres (Buxton 2013). Repeated attempts to locate this species elsewhere in California have not been successful (Buxton 2013).

Ornduff's meadowfoam is a winter annual that germinates in the fall. Flowering and fruiting occur simultaneously through the winter and early spring (Buxton 2013). The species currently occupies low-lying portions of an agricultural field, along with adjacent drainage ditches and ruts. The field is plowed annually, which reduces competition; the species completes its life cycle during the time when the field is fallow.

4.4.2 Survey Results

Initial reconnaissance surveys did not discover any special-status plant species, but the surveys were not appropriately timed to determine the presence of rare plants with potential to occur in the BSA. Several special-status plants (defined here as plants ranked CRPR 1A, 1B, 2A, or 2B2, as well as state and federally listed species) have potential to occur in the BSA and have known occurrences mapped nearby (see Figure 4-2) but would not have been detectable at the time of survey. As a result, additional focused surveys are being conducted in 2022.

Ornduff's meadowfoam, a CRPR 1B.1 special-status plant, was identified in the BSA during a follow up survey in March 2022. Ornduff's meadowfoam is an annual plant only known to occur the area between Half Moon Bay and Moss Beach. The species was initially identified in 1998 in an agricultural field at that location. The core of this species' population grows densely over an area of approximately 18 acres (Buxton 2013). Repeated attempts to locate this species elsewhere in California have not been successful (Buxton 2013).

Ornduff's meadowfoam is a winter annual that germinates in the fall. Flowering and fruiting occur simultaneously through the winter and early spring (Buxton 2013). The species currently occupies low-lying portions of an agricultural field, along with adjacent drainage ditches and ruts. The field is plowed annually, which reduces competition; the species completes its life cycle during the time when the field is fallow.

An area of agricultural cropland adjacent to SR 1 supports the only known population of this plant. The population appears to be thriving in the constant disturbance regime and moist soil conditions in the agricultural field where it occurs. During a site visit on April 15, 2022, and AECOM botanist identified Ornduff's meadowfoam occurring on both sides of the freeway where it is known to occur. Caltrans previously assessed potential drainage work in this area. Poor drainage of the agricultural croplands in the BSA is likely a contributing factor to the moderately moist soil (i.e., mesic) conditions associated with this plant population. To avoid impacts to this newly discovered population, Caltrans eliminated the drainage work considered at this location from the project.

4.4.2.1 Project Impacts

The project has potential to impact Ornduff's meadowfoam directly by conducting vegetation removal or ground-disturbing activities where the species occurs; or impact it

indirectly, if the drainage downstream or upstream of the occurrence is altered. A drainage improvement downstream from the known occurrence could degrade the current moist soil conditions, and drainage modifications upstream could affect seasonal wetting in a way that is detrimental to the species. A substantial change in soil moisture regime may eradicate Ornduff's meadowfoam where it occurs in the BSA and have an adverse impact on the only known population of this species.

4.4.2.2 Avoidance and Minimization Efforts

Caltrans will implement the following AMMs to protect special-status plants prior to construction:

- **BIO-04 Rare Plant Survey.** Caltrans will complete a rare plant survey in the BSA to determine the presence or absence of special-status plant species. To ensure that surveys are conducted at an appropriate time to identify all the target species, as many as three survey replicates will be performed. The survey replicates will be timed based on target species blooming periods and rainfall levels, but are targeted to occur in March, late April/May, and June of 2022. All plants will be identified to a level needed to verify protected status. Any listed plants discovered in the field will be mapped and included as ESAs in the final plans and specifications. Caltrans will consult with the appropriate wildlife agency with jurisdiction and obtain necessary permits or authorizations if unavoidable take of a listed plant species incidental to the proposed work would occur.

- **BIO-05 Pre-Construction Plant Survey.** A project biologist with appropriate botany experience will perform a site survey in ESAs where construction disturbance could occur before start of work. Special-status plants will be flagged and avoided where possible. Caltrans will coordinate with appropriate wildlife agencies with jurisdiction prior to construction if incidental take of a listed plant species is unavoidable and will obtain any necessary permits or authorizations for direct impacts. Caltrans will adhere to the requirements of all permits and authorizations issued for the project.

- **BIO-6 Avoidance of Ornduff's Meadowfoam.** Caltrans will avoid drainage system rehabilitation or other work in unpaved areas that could affect soil hydrology on the east side of SR 1 within 3,000 feet of where Ornduff's meadowfoam is known to occur. If Caltrans later determines that rehabilitating the drainage system at this location is necessary it will complete a soil hydrology study, drainage system design, and mitigation plan in coordination with CDFW that results in no net loss of this species or its habitat.

4.4.2.3 Compensatory Mitigation

With implementation of the AMMs and project features for the project, no impacts requiring compensatory mitigation are anticipated at this time. However, because rare plant surveys are still ongoing, the project has potential to provide compensation if special-status plants occur in the area and incidental take is unavoidable. If additional special-status plant species are discovered by the rare plant survey and effects

requiring compensation are required, Caltrans will coordinate appropriate compensation with the wildlife agency(s) with jurisdiction.

4.4.2.4 Cumulative Impacts

By incorporating the BMPs and AMMs described in this NES, the proposed project will not contribute to substantial cumulative effects on special-status plant species.

4.5 Special-Status Wildlife Species

Animals are of special concern based on (1) federal, state, or local laws; 2) limited distributions; and/or (3) the habitat requirements of special-status animals occurring on site. The following species have a moderate to high likelihood to occur in the project footprint: California red-legged frog and San Francisco garter snake and their critical habitat.

Sixteen special-status wildlife species were initially evaluated for potential to occur in the BSA. Of these, two federally listed species—the California red-legged frog and San Francisco garter snake (also state-listed under CESA, and a state fully protected species) were determined to have some potential to occur in the BSA, based on nearby occurrences and habitat availability. The remaining wildlife species shown in Appendix E were eliminated from further consideration because the BSA does not contain suitable habitat or because it is outside the species' known ranges.

4.5.1 Steelhead

The Central California Coast DPS of steelhead is a federally threatened species (62 FR 43937, August 18, 1997).

4.5.1.1 Distribution

Central California Coast steelhead DPS includes all naturally spawned anadromous populations below natural and manmade impassable barriers in California streams from the Russian River (inclusive) to Aptos Creek (inclusive), and the drainages of San Francisco, San Pablo, and Suisun Bays, eastward to Chipps Island at the confluence of the Sacramento and San Joaquin Rivers (71 FR 834, January 5, 2006).

California Central Coast steelhead have experienced major declines in abundance and negative long-term population trends, providing an indication that the DPS may not be viable in the long term. However, California Central Coast steelhead have remained present in most streams throughout their known historical range, indicating that they possess a resilience that is likely to slow their decline relative to other salmonid DPSs or ESUs in worse condition (NMFS 2016). Their iteroparous life history and variation in time spent in streams and the ocean have helped the steelhead populations persist in the face of altering habitat conditions.

4.5.1.2 Habitat Requirements

Like other salmon, steelhead rely on marine, estuarine, and freshwater habitats throughout their life cycle. Steelhead require cool water temperatures, with preferred temperatures ranging from 15 to 18 degrees Celsius (°C) (59 to 64 °F), and lethal temperatures ranging from 24 to 27°C (75 to 80°F) (Moyle 2002).

Steelhead employ a variety of migrational life history strategies that take advantage of the diversity of river systems and regional conditions to which it has adapted. Central California Coast 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 therefore are ready to spawn within a short period after arriving (Moyle 2002). Steelhead typically chooses steeper gradient stream reaches, farther upstream and farther up tributaries than Chinook or Coho salmon, and the species can spawn in either the mainstem rivers or farther up into tributaries.

In California, most juvenile steelhead remain in their natal streams for 2 years before emigrating to the ocean during late spring or early summer, although 1- to 4-year periods of freshwater residence are known to occur. Although residing in freshwater, juvenile steelhead typically feed on a variety of invertebrates while inhabiting cool water reaches with sufficient cover. This cover may take the form of in-stream structures such as boulders, submerged large wood, and plunge pools; or may consist of overhanging vegetation and undercut banks. Estuaries often are important rearing areas for juvenile steelhead on their way to the ocean.

4.5.1.3 Reproduction

Steelhead typically begins returning to the coastal waters in late fall and wait for storm runoff to enable passage through lagoon sand barriers or other low-water passage impediments, with most migration occurring from December through February. Spawning takes place from January through April (Moyle 2002). Adults spawn in clean gravels and cobbles, typically at tail crests or riffles where surface waters are forced into the gravel, thereby keeping the gravel clean and the eggs well oxygenated. Juvenile steelhead are found in all habitat types, and habitat preferences change with seasonal changes in stream conditions.

4.5.1.4 Movement

Steelhead require viable migration pathways from the ocean up through estuarine rearing, freshwater rearing, and freshwater spawning areas to complete their life cycle. Culverted road crossings, water impoundments, and other manmade structures constructed in waterways may present partial or total barriers to these necessary upstream and downstream movements. CDFW manages the PAD which provides access to nearly all available assessments of potential passage barriers on waterways that may or may not have potential to support steelhead or other anadromous fish. There are several levels of passage assessment studies represented in the PAD, from reconnaissance-level reviews relying on professional judgement up through modeled hydrologic analysis. The PAD was queried for potential passage barriers in the BSA. The results are summarized in Table 4-4.

Table 4-4 Passage Assessment Database Road Crossing Entries within the Biological Study Area

Stream Name	PAD Id #	Structure	Barrier Status	Anadromy*
Frenchman’s Creek	707274	SR 1 culvert	Temporal	May Support
Denniston Creek	712366	SR 1 Bridge	Unknown	May Support

Stream Name	PAD Id #	Structure	Barrier Status	Anadromy*
Arroyo Leon (Pilarcitos Creek)	712368	SR 1 Bridge	Unknown	Yes
Arroyo Leon	733870	Culvert SR 1	Unknown	Yes
Pacific Ocean	733872	Culvert SR 1	Unknown	No
unnamed	733873	Culvert SR 1	Unknown	No
Arroyo de en Medio	733874	Culvert SR 1	Unknown	Not Likely
Pacific Ocean	733875	Culvert SR 1	Unknown	No
Pacific Ocean	733876	Culvert SR 1	Unknown	No
Pacific Ocean	733877	Culvert SR 1	Unknown	No
Pacific Ocean	733878	Culvert SR 1	Unknown	No
Pacific Ocean	733880	Culvert SR 1	Unknown	No
unnamed tributary to Denniston Creek	733881	Culvert SR 1	Not a barrier	Not Likely
Deer Creek	761161	SR 1 Crossing	Unknown	May Support

Notes:

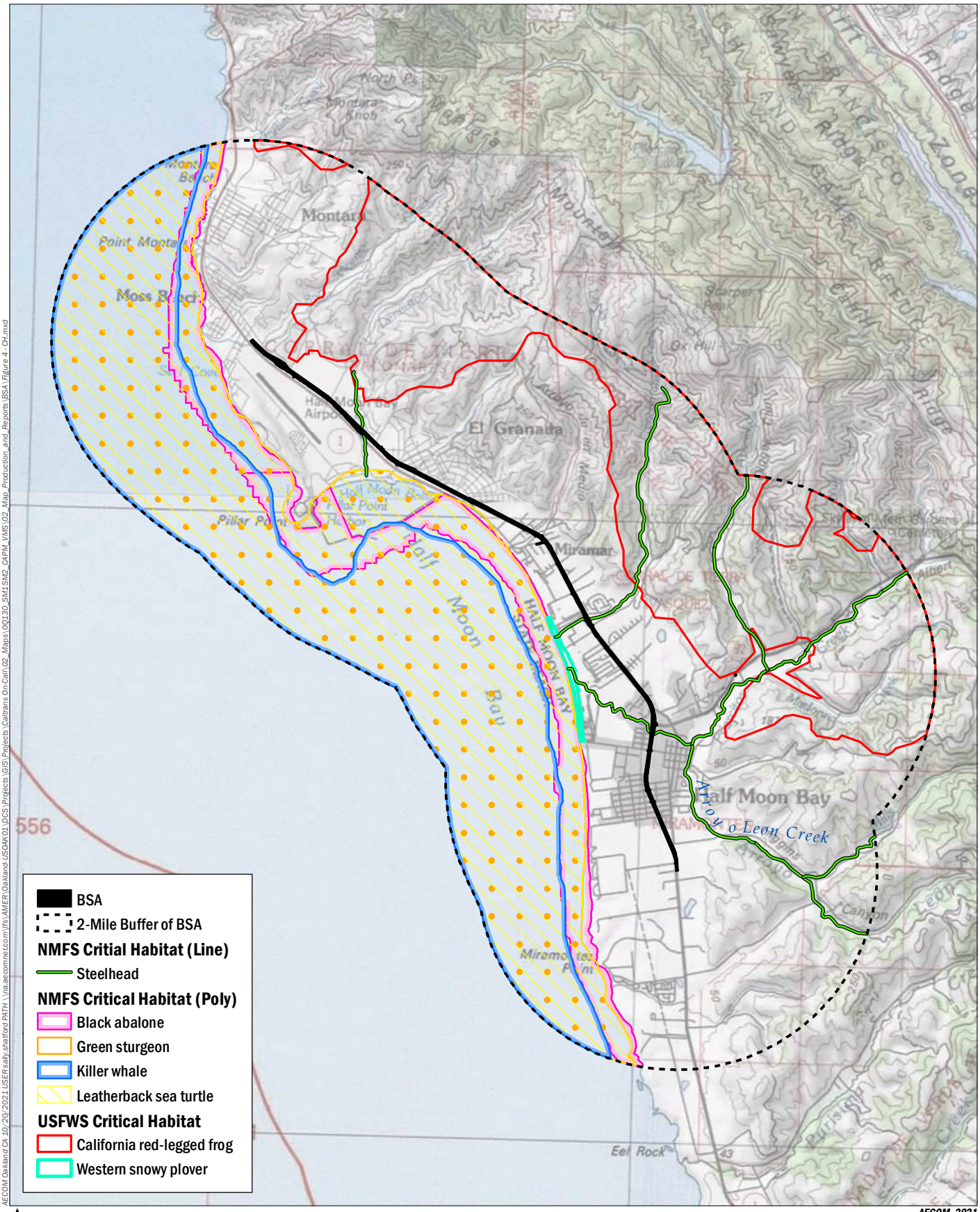
* Indicates the potential for the crossing waterway to support anadromous fish, such as steelhead or Coho Salmon.

PAD = Passage Assessment Database
SR = State Route

4.5.1.5 Critical Habitat

Designated critical habitat for this species includes all naturally spawned populations of steelhead in estuarine areas that are below mean higher high water, and waterways that are used for migration, spawning, and rearing by this species. Designated critical habitat for steelhead consists of four physical and biological features that are essential to the conservation of the species: (1) freshwater spawning sites with suitable substrate and water quality conditions; (2) freshwater rearing sites that supply forage and cover, and have suitable water quality; (3) freshwater migration corridors free of obstructions, and with suitable cover and water quality; and (4) estuarine areas free of obstructions, with suitable cover, forage, and water quality (70 FR 52488, September 2, 2005).

In the BSA, Denniston Creek, Frenchman's Creek, and Pilarcitos Creek are designated as critical habitat for CCC DPS steelhead (Figure 4-3).



AECOM

Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

FIGURE 4-3
Critical Habitat

4.5.1.6 Survey Results

A review of existing information was conducted to assess the status and potential occurrence of steelhead in the BSA. The 2008 CEMAR report of Steelhead/Rainbow Trout Resources South of the Golden Gate, California (Becker and Reining 2008) provides a comprehensive review of current and historical records of this species occurrence. The 2008 CEMAR report indicates that steelhead likely occupy Denniston and Frenchman's Creeks, are known to occupy Pilarcitos Creek, and are unlikely to occupy Deer and Arroyo de en Medio Creeks. The remaining unnamed drainages in the BSA lack the necessary hydrologic characteristics to support steelhead. The aforementioned waterways that are likely or known to be occupied by steelhead are also designated as critical habitat for CCC steelhead, which is a fairly good proxy for potentially occupied waters. CNDDB also indicates recent records of steelhead from Frenchman's Creek.

4.5.1.7 Project Impacts

No culvert replacement or other instream work would occur at the three creeks in the BSA that have potential to support CCC DPS steelhead (Denniston, Frenchman's, and Pilarcitos creeks). Work near those three waterways would be limited to guardrail replacement, which may involve vegetation removal from the road shoulder or the trimming of tree branches that overhang the road shoulder. This limited form of vegetation removal is not expected to result in any decrease in shading or other forms of riparian habitat contribution to areas potentially supporting steelhead. Culvert replacement work would occur at Arroyo de en Medio Creek and a few unnamed drainages. However, those waterways are not expected to support steelhead, and they all feed directly into the Pacific Ocean and thus are not tributaries to waterways that may support steelhead. Therefore, the proposed project follows the requirements of Senate Bill 857.

4.5.1.8 Avoidance and Minimization Measures

Implementation of the project features described in Section 1.6 will protect potential habitat for Central California Coast DPS steelhead from siltation due to erosion and spills that may adversely impact water quality. In addition, the following avoidance measure will be implemented:

- **BIO-7: Riparian Vegetation Protection.** All riparian habitat in the project area will be delineated as an ESA, and no construction activities will occur outside of the immediate work area in riparian habitat ESAs. At the roadway crossings of Denniston, Frenchman's, and Pilarcitos Creeks, Caltrans will limit riparian vegetation removal to the immediate work area. Trees or shrub trimming at those locations will be limited to removing only branches that overhang the roadway.

4.5.1.9 Compensatory Mitigation

Because there will be no impacts to potential habitat for this species, no compensatory mitigation is needed.

4.5.1.10 Cumulative Impacts

Because there would be no modification to potential habitat for this species, there is no potential for cumulative impacts to occur.

4.5.2 Coho Salmon

The Central California Coast ESU was listed as endangered in 1996 (61 FR 56138) and is also a state endangered species under CESA.

4.5.2.1 Distribution

This ESU includes all naturally spawned coho salmon, encompassing reaches of all rivers (including estuarine areas and tributaries) between Punta Gorda (Mendocino County) and San Lorenzo River (Santa Cruz County). This includes two streams entering the San Francisco Bay: (1) Arroyo Corte Madera Del Presidio and (2) Corte Madera Creek (NMFS 2012). The only streams south of San Francisco Bay that frequently support a population are Scott and Waddell Creeks in Santa Cruz County; however, adults have sporadically been observed in Gazos and Pescadero Creeks in San Mateo County (Moyle 2002). In 2011, an estimate of only 2,000 to 3,000 individual adult Central California Coast coho salmon spawners have returned to their natal site. The degraded freshwater streams and rivers, in combination with poor ocean conditions, have led to Central California Coast coho salmon's pronounced decline. The most recent status review for the Central California Coast coho salmon ESU concluded that the ESU is now very close to extinction (NMFS 2012).

4.5.2.2 Habitat Requirements

Reproduction

Coho salmon move upstream after heavy rains have opened the sandbars that form at the mouths of many California coastal streams. Generally, adult fish enter their natal freshwater streams from September through January to spawn, with spawning activity peaking between mid-November and mid-January (CDFW 2004).

Each spawning female may create several redds (gravel nests on stream bottoms) during spawning. After hatching, the alevins remain in the interstices of the gravel for up to 10 weeks until their yolk sacs have been absorbed; they then turn into fry, which emerge from the gravel between March and July, with peak emergence occurring from March to May. They seek out shallow water, usually moving to the stream margins (CDFW 2004). During the juvenile stage, they begin to feed heavily; the schools generally break up, and individuals set up territories. As the juveniles continue to grow and expand their territories, they move progressively into deeper water, until July and August. Deep pools with large wood or other complex cover are critical for summer rearing (NMFS 2012).

Movement

Like steelhead, Coho require viable migration pathways from the ocean up through estuarine rearing, freshwater rearing, and freshwater spawning areas to complete their life cycle. See Table 4-4 for a summary of potential passage barriers in the BSA. Note

that many of these potential barriers are on ephemeral drainages or waterways that lack the hydrology and habitat characteristics needed to potentially support CCC ESU Coho.

Critical Habitat

Critical habitat was designated for the Central California Coast coho salmon ESU in 1999, (64 FR 24059). The areas designated as critical habitat include currently or historically occupied watersheds that provide:

1. juvenile summer and winter rearing areas;
2. juvenile migration corridors;
3. areas for growth and development to adulthood;
4. adult migration corridors; and
5. spawning areas.

Areas (1) and (5) are often located in small headwater streams; Areas (2) and (4) include these tributaries, as well as mainstem reaches and estuarine zones. Growth and development to adulthood occurs primarily in near- and off-shore marine waters (Area 3), although final maturation takes place in freshwater tributaries when the adults return to spawn. In these areas, essential physical and biological features of Coho salmon critical habitat include adequate substrate, water quality, water flow, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions.

Because the historic range of the species is poorly understood, there is some ambiguity regarding the extent of critical habitat for the species. Based on the size and hydrology of the watersheds in the BSA, it is unlikely that any of the watersheds other than Pilarcitos Creek historically supported Coho Salmon, and only that watershed may be considered as designated critical habitat for the species.

4.5.2.3 Survey Results

No evidence could be found, historical or otherwise, that Pilarcitos Creek or any of the other smaller drainages (such as Denniston or Frenchman's Creeks) in the BSA may support coho salmon (Spence et al. 2012, NMFS 2012). Furthermore, current habitat conditions in the waterways in the BSA are generally incompatible with the species because they lack summer cold water flows, deep pools with abundant cover, and a lagoon suitable for a successful transition to saltwater, all of which the species requires. Because this species is not expected to occur in the BSA, it is not discussed further.

4.5.3 California Red-Legged Frog

The California red-legged frog was federally listed as a threatened species under FESA on May 23, 1996, documented as 61 Federal Register (FR) 25813 (USFWS 1996).

4.5.3.1 California Red-Legged Frog Distribution

California red-legged frog is distributed throughout 26 counties in California but is most abundant in the San Francisco Bay area. Populations have become isolated in the

Sierra Nevada, northern Coast, and northern and southern Transverse and Peninsular ranges (Jennings and Hayes 1994; Stebbins 2003).

4.5.3.2 Habitat Requirements

California red-legged frog predominantly inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,900 feet in elevation (Jennings and Hayes 1994; Bulger et al. 2003; Stebbins 2003).

Breeding aquatic habitat consists of virtually all low-gradient freshwater (less than 7 parts per thousand salinity) bodies, including natural and manmade ponds; slow-moving streams and creeks; pools within streams; marshes; lagoons; and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years (USFWS 2010). Deep lacustrine water habitat (e.g., deep lakes and reservoirs 50 acres or larger in size) that are inhabited by predators, some nonnative, do not provide habitat for California red-legged frog (USFWS 2010). California red-legged frog require a permanent water source to ensure that aquatic habitat is available year-round. Permanent water sources can include ponds, perennial creeks (or permanent plunge pools within intermittent creeks), seeps, and springs (USFWS 2010).

Aquatic breeding habitat must have a minimum water depth of 20 inches and must maintain water during the entire tadpole-rearing season, identified as March through July (USFWS 2010). During periods of drought or less-than-average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but they would still be considered essential breeding habitat in wetter years (USFWS 2010).

Although aquatic nonbreeding habitat may not hold water long enough for California red-legged frog to complete its aquatic lifecycle, it does provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frog. Other wetland habitats that would meet these elements include plunge pools within intermittent creeks, seeps, quiet water refugia during high-water flows, and springs of sufficient flow to withstand the summer dry period (USFWS 2008).

Essential upland habitat consists of all upland areas surrounding breeding and nonbreeding habitat up to about 1 mile. This habitat comprises various plant communities—including grasslands, woodlands, wetlands, and riparian habitat—that provide shelter, forage, and predator avoidance. This upland habitat is required to maintain the hydrologic, geographic, topographic, ecological, and edaphic features supporting and surrounding the wetland or riparian habitat (USFWS 2008).

Essential dispersal habitat includes upland or riparian habitats that allows movement between subpopulations of California red-legged frog (USFWS 2008). Dispersal habitat does not include barriers such as heavily traveled roads (i.e., an average of 30 cars per hour from 10 p.m. to 4 a.m.) that lack bridges or culverts; moderate- to high-density urban or industrial developments; and large reservoirs more than 50 acres in size (USFWS 2010). Agricultural lands such as row crops, orchards, vineyards, and pastures do not constitute barriers to California red-legged frog dispersal (USFWS 2008, 2010).

There are physical and biological features, known as primary constituent elements , required for the conservation of California red-legged frog. These consist of two or more suitable breeding locations, a permanent water source, and associated uplands surrounding these water bodies up to 300 feet in from the water's edge—all within 1.25 miles of one another and connected by barrier-free dispersal habitat that is at least 300 feet wide (USFWS 2010).

4.5.3.3 Reproduction

California red-legged frog breed between November and April in standing or slow-moving water at least 2.5 feet deep with emergent vegetation, such as cattails (*Typha* spp.), tules (*Scirpus* spp.), or overhanging willows (*Salix* spp.) (Hayes and Jennings 1988). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925; Jennings and Hayes 1994). Larvae undergo metamorphoses 3.5 to 7 months after hatching and reach sexual maturity at 2 to 3 years of age (Jennings and Hayes 1994).

4.5.3.4 Movement

In a study of California red-legged frog terrestrial activity in the Santa Cruz Mountains, Bulger et al. (2003) categorized terrestrial use as migratory and nonmigratory. Nonmigratory activity occurred over one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger et al. (2003) reported that nonmigrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover (e.g., California blackberry, poison oak, and coyote brush). Migrating frogs were reported to have moved between sites that were separated by map distances of 0.12 to 1.73 miles. The longest reported route traveled was 2.24 miles by an individual moving between two sites 1.73 miles apart.

4.5.3.5 Critical Habitat

On April 16, 2010, USFWS designated revised critical habitat for the California red-legged frog under FESA. At the time of designation, approximately 1,636,609 acres of critical habitat existed in 27 counties in California. The current acreage of final critical habitat is 112,052,881.11, according to the USFWS Environmental Conservation Online System database (USFWS 2021a). Critical habitat for the California red-legged does not occur in the project footprint, but does occur within 2 miles of the project area. These locations fall within the SNM-1 Critical Habitat Unit for California red-legged frog (Figure 4-3).

Primary constituent elements of the California red-legged frog critical habitat are (1) two or more suitable breeding locations, (2) a permanent water source, and (3) associated uplands surrounding these water bodies up to 300 feet from water's edge, all within 1.25 miles of one another and connected by barrier-free dispersal habitat that is at least 300 feet in width (USFWS 2006).

4.5.3.6 Survey Results

Riverine habitat exists in the project BSA, and California red-legged frogs can move overland considerable distances. Based on this information, it is reasonable to conclude that upland habitat within 2 miles from a known or potential breeding pond is potential California red-legged frog dispersal and aestivation habitat, provided there are no known barriers to movement. No protocol-level California red-legged frog surveys were conducted for this project. Instead, this document synthesizes the best available scientific and commercial evidence to describe California red-legged frog habitat requirements at each life stage, occurrences near the project footprint, and presence of suitable habitat in the BSA. Data to support these descriptions were derived from literature review, database searches (such as CNDDB), evaluation of habitat during site visits and surveys, and consultation with CDFW and USFWS.

Multiple California red-legged frog occurrences are documented within 2 miles of the project footprint (Table 4-5). The baseline disturbance of SR 1, local dense street traffic, visitor activity in adjacent parking lots, gas stations, shopping centers, residential development, and bus stops adjacent to the footprint likely exceeds the disturbance of project work. There is agricultural and undeveloped land that may provide a potential route, aside from SR 1, free of major barriers for frogs to disperse through the BSA. A roadside ditch on SR 1 may further increase connectivity between other open areas and the BSA. The ditch and associated culverts may provide shelter as well as aquatic habitat during portions of the year. The project footprint is, however, subject to regular mowing; its value to frogs is likely restricted to frogs dispersing through the area, mostly during inclement weather. Access and staging will be on SR 1 and/or the adjacent road. Work will be of shorter duration and will occur during daytime and during the dry season when frogs are unlikely to initiate movements, thus minimizing potential impacts to the frog.

Table 4-5 California Red-Legged Frog Occurrences within 2 Miles of the Biological Study Area

Occurrence Number	Year	Observation	Distance from BSA (miles)	Status
750	2004	one adult	0	Presumed extant
354	2016	six juveniles	0.53	Presumed extant
38	2006	five+ heard, one adult captured	0.5	Presumed extant
1345	2010	Multiple adults observed, many heard, one egg mass	0.32	Presumed extant
962	2006	two observations of one adult	0	Presumed extant

Occurrence Number	Year	Observation	Distance from BSA (miles)	Status
1449	2016	four yearlings	1.31	Presumed extant
301	1999	one adult and one subadult	0.52	Presumed extant
242	1997	one adult and tadpoles	0.27	Presumed extant
976	2006	six adults	0.28	Presumed extant
924	2007	one juvenile	1.55	Presumed extant
853	2001	one adult	0.66	Presumed extant

Note:
BSA = biological study area

4.5.3.7 Project Impacts

The proposed project has the potential to adversely affect individual frogs that occur at the project site during construction, through trampling or other direct interaction with construction activities, which may result in injury, mortality, or harassment. Project related ground disturbance from vegetation removal; equipment and vehicle staging; trampling of vegetation; construction-related dust; increases in noise and light; and impacts to water quality during construction all have potential to cause indirect impacts to California red legged frog.

Additionally, small areas of potential habitat for California red-legged frog would be permanently and temporarily impacted due to ground disturbance and vegetation removal. The project's direct impacts on potential habitat are estimated in acreage, depending on whether they are permanent or temporary in nature. Permanent impacts are those that remove habitat for more than 1 year and temporary impacts are those that remove habitat for less than 1 year. Impacts to upland/dispersal habitat are based on the maximum estimated ground disturbance throughout the project footprint. Table 4-6 summarizes potential permanent or temporary impacts on California red-legged frog habitat in the BSA.

Table 4-6 Potential Impacts to California Red-Legged Frog

Habitat Type	Impact Type	Area (acres)
Aquatic breeding	Permanent	0
Aquatic breeding	Temporary	0
Aquatic nonbreeding	Permanent	0
Aquatic nonbreeding	Temporary	0.03
Upland/dispersal	Permanent	0.01
Upland/dispersal	Temporary	1.09

4.5.3.8 Avoidance and Minimization Efforts

In addition to the project features described in Section 1.6, AMMs specific to the California red-legged frog are needed and listed here. These AMMs also apply to San Francisco garter snake because they occupy the same habitats; the measures would equally serve to avoid and minimize impacts to both species:

- **BIO-8: Seasonal Avoidance.** Construction activities off paved surfaces in areas of potential California red-legged frog habitat (ESAs) will be performed between June 15 and October 15 to minimize impacts on this species. Designated staging areas may be used outside of this work window once cleared by a USFWS-Approved Biologist or their designee and fenced, as appropriate.

- **BIO-9: Proper Use of Erosion Control Devices.** To avoid entanglement or injury of California red-legged frog or San Francisco garter snake, erosion control materials that use plastic or synthetic monofilament netting will not be used.

- **BIO-10: Avoidance of Entrapment.** To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered at the close of each working day with plywood, or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks at an angle no greater than 30 degrees. Before such holes or trenches are filled, they must be thoroughly inspected for trapped animals. All replacement pipes, hoses, culverts, or similar structures less than 12 inches in diameter will be closed, capped, or covered upon entry to the project site. All similar structures greater than 12 inches must be inspected before they are subsequently moved, capped and/or buried.

- **BIO-11: Biological Monitor.** The names and qualifications of proposed biological monitor(s) will be submitted to the USFWS for approval prior to the start of construction. The USFWS-approved biological monitor(s) will keep a copy of the USFWS biological opinion in their possession when on site. Through communication with the resident engineer, the USFWS-approved biological monitor(s) will be on site during all work that could reasonably result in take of California red-legged frog or other special-status species. The USFWS-approved biological monitor(s) will have the authority to stop work that may result in the unauthorized take of special-status species. If the USFWS-approved biological monitor exercises this authority, the USFWS will be notified by telephone and e-mail message within one working day.

- **BIO-12: Pre-Construction/Daily Surveys.** Pre-construction surveys for special-status species, will be conducted by the USFWS-approved biological monitor no more than 14 calendar days prior to any initial ground disturbance and immediately prior to ground-disturbing activities (including vegetation removal and fence installation) in the project footprint. These efforts will consist of walking surveys of the project limits and, if possible, accessible adjacent areas within at least 50 feet of the project limits. The USFWS-approved biological monitor will investigate potential cover sites when it is feasible and safe to do so. 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 will be documented and relocated to an adequate cover site in the vicinity, with the exception of fully protected species. Safety permitting, the USFWS-approved biological monitor will also survey areas of disturbed soil for signs of California red-legged frog or San Francisco garter snake within 30 minutes following initial disturbance of the given area. The need for further pre-construction surveys will be determined by the Biologist based on site conditions and realized construction timelines.

- **BIO-13: Protocol for Species Observation.** The USFWS-approved biological monitor(s) will have the authority to halt work through coordination with the resident engineer if California red-legged frog or San Francisco garter snake are observed in the project footprint. The resident engineer will keep construction activities suspended in a 50-foot radius of the California red-legged frog or San Francisco garter snake in any construction area where the biologist has determined that a potential take of the species could occur. Work will resume after observed listed individuals leave the site voluntarily, the biologist determines that no wildlife is being harassed or harmed by construction activities, or the wildlife is relocated by the biologist to a release site using USFWS-approved handling techniques.

- **BIO-14: Handling of California Red-Legged Frog.** If a listed species is discovered, the resident engineer and USFWS-approved biological monitor will be immediately informed.

    - If a California red-legged frog gains access to a construction zone, work will be halted immediately within 50 feet until the animal leaves the site or is captured and relocated by the USFWS-approved biological monitor.

    - The USFWS will be notified within one working day if a California red-legged frog or San Francisco garter snake is discovered in the construction site.

    - The captured California red-legged frog will be released in appropriate habitat outside of the construction area but near the capture location. The release habitat will be determined by the USFWS-approved biological monitor.

    - The USFWS-approved biological monitor will take precautions to prevent introduction of amphibian diseases in accordance with the *Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog* (USFWS 2005).

4.5.3.9 Compensatory Mitigation

The proposed action has potential to impact California red-legged frog and San Francisco garter snake habitat. The project features and species-specific AMMs (work windows, preconstruction surveys, and USFWS-approved biologists) are expected to reduce effects to California red-legged frog and their habitat. Restoration of temporarily

disturbed areas includes efforts to remove invasive plants and reseed with local native plants. No compensatory mitigation is proposed.

4.5.3.10 Cumulative Impacts

The proposed project is not growth-inducing and is not anticipated to result in an increase in vehicular traffic; any new development; or any associated future increases in lighting, noise, or vibrations. In addition, the project will not create any new permanent barriers to species' movement. Therefore, it will not contribute to cumulative effects on any listed, proposed, or candidate species.

4.5.4 San Francisco Garter Snake

The San Francisco garter snake was federally listed as an endangered species under FESA on March 11, 1967 (FR 32 4001). No critical habitat has been designated. San Francisco garter snake was listed as a state endangered species in 1971 (USFWS 2006) and is listed as a Fully Protected Species under CFGC Section 5050. The listing occurred because of San Francisco garter snake habitat loss across the snake's range. Threats to the San Francisco garter snake identified in the recovery plan (USFWS 2006) included loss and isolation of habitat due to development, and illegal collecting by amateur herpetologists.

4.5.4.1 Natural History

The San Francisco garter snake is a colorful, medium sized snake with a head barely wider than the neck and keeled dorsal scales. Adults of this species measure 18 to 55 inches in length, but the average size is less than 36 inches (USFWS 2007).

Distribution

The San Francisco garter snake is limited in distribution to portions of San Mateo and Santa Cruz counties. Remnant populations have been identified throughout the species' historic range. These include the West of Bayshore population (near San Francisco International Airport), the Laguna Salada population (near Mori Point), the San Francisco State Fish and Game Refuge population (near Crystal Springs and San Andreas reservoirs), the Pescadero Marsh population, the Año Nuevo State Reserve population, and the Cascade Ranch population (USFWS 2006).

Habitat Classifications

In a 5-year review of the status of the San Francisco garter snake, the USFWS identified several primary habitat elements essential to support San Francisco garter snake breeding (USFWS 2006). These elements include open grassy uplands with a flora composition consisting of such species as coyote bush (*Baccharis pilularis*), wild oat, wild barley (*Hordeum* spp.*),* and various brome species (*Bromus* spp.); a grassland/ shrub matrix in these uplands, with brush densities ranging from one average plant per 98 square feet to one large plant per 66 square feet to allow sufficient cover from predators; upland estivation habitat in the way of small mammal burrows; freshwater habitat containing emergent vegetation such as cattails, spike rush (*Eleocharis* spp.), water plantain (*Alisma* spp.), willow, and *Rubus* species; open water and shallow water components to the wetlands; a breeding prey base of California red-legged frogs and

Pacific tree frogs; and a potential preference toward slopes with southern- or western-facing exposures. San Francisco garter snake prefer habitat in the vicinity of open hillsides for thermoregulating, winter hibernation, feeding, and finding cover in rodent burrows, usually in open meadows, grassland, and grassland/scrub matrix (USFWS 2007). San Francisco garter snake also can also be found outside of areas with these features as they search for mates, disperse, forage, and move between aquatic habitats (USFWS 2007).

Feeding

The presence of habitat conditions that encourage viable breeding populations of Pacific tree frogs and California red-legged frogs are crucial to the survival of San Francisco garter snake. Breeding populations of San Francisco garter snake are unknown in locations where amphibian prey is absent (USFWS 2006). The San Francisco garter snake avoid brackish marsh areas because their preferred prey base (Pacific tree frogs and California red-legged frog) cannot survive in saline water. Therefore, increased levels of salinity in freshwater corridors are also a threat to San Francisco garter snake (USFWS 2006).

Reproduction

Although mating can occur in the fall, the first warm days of March encourage encounters as San Francisco garter snake emerge from their hibernacula and concentrate in nearby aquatic habitat. Like other garter snakes, they are ovoviviparous. That is, following fertilization the female retains the eggs inside her body until hatching occurs; in July and August, offspring are born live and independent. There may be 12 to 24 in a litter (USFWS 2006).

Movement

According to USFWS's review of dispersal data, San Francisco garter snake have been known to move on average between 328 feet and 656 feet from pond foraging habitat to upland wintering sites, and some individuals have been observed to move more than 2,200 feet (USFWS 2006). Typically, San Francisco garter snake do not appear to move distances of more than 0.60 mile, although longer San Francisco garter snake movements may occur in pursuit of prey (USFWS 2006). The San Francisco garter snake are not known to exhibit the wide-ranging movements associated with California red-legged frog (McGinnis 1987).

Unlike other garter snakes in the Bay Area, the San Francisco garter snake does not appear to undergo true hibernation during the winter months, and instead emerges periodically from hibernacula during the winter to bask. San Francisco garter snake are most active between the spring and fall. Peak activity is observed between March and July, when adults emerge from hibernacula and concentrate around aquatic habitats to mate and forage for food (USFWS 2006).

Population Threats

The greatest threats to San Francisco garter snake survival are development and destructive land management practices, which affect both habitat quality and prey sources. Illegal collection is also a threat to the species.

Critical Habitat

No critical habitat has been designated for the San Francisco garter snake.

4.5.4.2 Critical Habitat

Critical habitat has not been designated for this species.

4.5.4.3 Survey Results

San Francisco garter snake were not observed on site during reconnaissance site visits. Caltrans relied on the best available scientific and commercial data, including literature searches and a visual assessment, to evaluate the potential for this species to occur in the BSA and to infer a potential for presence. A review of CNDDB reveals approximately nine occurrences of San Francisco garter snake within 5 miles of the project footprint. The online application iNaturalist was also used to find approximate locations of San Francisco garter snake for this document. iNaturalist inputs user observation data but will skew it if the resource is sensitive. There were four occurrences within 5 miles of the project footprint.

No protocol-level San Francisco garter snake surveys were conducted as part of the background information collected for the project. Eleven recorded occurrences of San Francisco garter snake exist within 2 miles of project BSA locations (Table 4-7). Three observations are known to be extirpated, others occur near locations that have paved footprints, and all but one (occurrence 7) are precluded from occurring in the Project Footprint by barriers such as the SR 1 concrete median, residential development, or distance to the footprint.

Table 4-7 San Francisco Garter Snake Occurrences within Two Miles of the Biological Study Area

Occurrence Number	Year	Observation	Distance from BSA (miles)	Status
7	1996	Detected in 1996, but none trapped in 2006	0.48	Presumed extant
56	1979	one individual observed	1.70	Presumed extant
31	198X	one individual observed	0.50	Presumed extant
35	2004	one adult observed	0.04	Presumed extant

Note:

BSA = biological study area

Although habitat for San Francisco garter snake occurs in the BSA, only very marginal habitat was observed in the project footprint. The portions of the project footprint that are made up primarily of paved surfaces, graveled shoulders, and regularly mowed

areas do not provide the physical or biological elements required to support San Francisco garter snake in any of its life stages. Although unlikely, the possibility exists that San Francisco garter snake individuals could occur in the project footprint.

4.5.4.4 Project Impacts

Potential habitat for this species in the project footprint is marginal, and implementation of project features (Section 1.6) and AMMs (Section 4.5.3.8) would prevent San Francisco garter snake from being trapped, injured, or killed during project implementation. For example, implementing BIO-8: Seasonal Avoidance would limit construction off of paved surfaces to the time period when San Francisco garter snakes are active and can avoid construction equipment. The presence of biological monitors, as described in BIO-11 would further ensure that take of the species does not occur. Individuals outside of the project footprint could be indirectly impacted due to construction-related dust, increases in noise and light, and impacts to water quality during construction.

Small areas of potential habitat for San Francisco garter snake would be permanently and temporarily impacted due to ground disturbance and vegetation removal. Project impacts can be quantified in acreage, depending on whether they are permanent or temporary in nature. Permanent impacts are those that remove habitat for more than 1 year and temporary impacts are those that remove habitat for less than 1 year. Impacts to upland/dispersal habitat are based on the maximum estimated ground disturbance in the project footprint. Table 4-8 provides an estimate of impacts to different types of potential San Francisco garter snake habitat.

Table 4-8 Impacts to San Francisco Garter Snake Potential Habitat

Habitat Type	Impact Type	Area (acres)
Aquatic breeding	Permanent	0
Aquatic breeding	Temporary	0.03
Upland/dispersal	Permanent	0.01
Upland/dispersal	Temporary	1.09

4.5.4.5 Avoidance and Minimization Efforts

In addition to the project features explained at the beginning of this chapter, AMMs specific to the California red-legged frog and San Francisco garter snake are discussed in Section 4.5.3.8. The AMMs are combined because they occupy the same habitats, and the measures would equally serve to avoid and minimize impacts for both species.

4.5.4.6 Compensatory Mitigation

The proposed action has potential to impact San Francisco garter snake habitat. The project features and species-specific AMMs (work windows, preconstruction surveys, and USFWS agency-approved biologists) are expected to reduce effects to San Francisco garter snake and their habitat. Restoration of temporarily disturbed areas

include efforts to remove invasive plants and reseed with local native plants. No compensatory mitigation is proposed.

4.5.4.7 Cumulative Effects

The proposed project is not growth-inducing and is not anticipated to result in an increase in vehicular traffic; any new development; or any associated future increases in lighting, noise, or vibrations. In addition, the project will not create any new permanent barriers to the species' movement. Therefore, it will not contribute to cumulative effects on any listed, proposed, or candidate species.

4.6 Essential Fish Habitat

Because Pilarcitos Creek may have historically supported coho salmon, it is designated as EFH under the Pacific Coast Salmonid Fisheries Management Plan.

4.6.1 Survey Results

Pilarcitos Creek is not expected to provide spawning areas for coho; however, if the species occurs in the BSA, conditions there may be suitable as winter rearing areas, juvenile migration corridors, and adult migration corridors. The species has not been reported from Pilarcitos Creek watershed and is not expected to currently occupy the creek (NMFS 2012).

4.6.2 Project Effects

No culvert replacement or other instream work would occur at Pilarcitos Creek where EFH is present. Work near this waterway would be limited to guardrail replacement, which may involve vegetation removal from the road shoulder or the trimming of tree branches that overhang the road shoulder. This limited form of vegetation removal is not expected to result in any decrease in shading or other forms of riparian habitat contribution to areas potentially supporting salmon. As a result, there would be no effects to EFH.

4.7 Habitat Connectivity

While the proposed project would replace guardrails and crash cushions, there would be no change to the highway design in terms of permeability to crossing wildlife. The highway would not be widened by the project, and it would not result in an increase in traffic. No new lighting would be installed as part of the project. In summary, the proposed project would not impact habitat connectivity.

Chapter 5: Conclusions and Regulatory Determinations

5.1 Federal Endangered Species Act Consultation Summary

Several of the creeks in the BSA are known to or are likely to support CCC DPS steelhead and are designated as critical habitat for the species. Additionally, Pilarcitos Creek may support CCC ESU coho salmon and is designated critical habitat for that species. However, work in the vicinity of these waterways would be limited to guardrail replacement in the current footprint of road shoulder areas, and there would be no impacts to aquatic or riparian habitat at those locations. Implementation of the project features would prevent siltation or water quality degradation from impacting potential habitat for steelhead and Coho salmon. No effects to ESA-listed species under NMFS jurisdiction are anticipated, and consultation with NMFS will not be needed.

The proposed project may affect but is not likely to adversely affect California red-legged frog and San Francisco garter snake.

Biological Assessments are being prepared pursuant to FESA Section 7 consultation with the USFWS.

5.2 Essential Fish Habitat Consultation Summary

EFH is present in Pilarcitos Creek BSA for coho salmon. However, the proposed project is not likely to adversely affect designated critical habitat for either species in the BSA. However, work in the vicinity of this waterway would be limited to guardrail replacement in the current footprint of road shoulder areas, and there would be no impacts to aquatic or riparian habitat at those locations. Implementation of the project features would prevent siltation or water quality degradation from impacting EFH. No effects to EFH are anticipated, and consultation with NMFS will not be needed.

5.3 California Endangered Species Act Consultation Summary

State-listed species that have the potential to occur in the BSA include coho salmon-Central California Coast ESU and San Francisco garter snake. Coordination with CDFW will occur during the project planning phase, as part of a CFGC Section 1602 Lake and Streambed Alteration Agreement, which will likely be needed for the culvert replacement work at the Arroyo de en Medio crossing. No state-level take of CESA species is anticipated at the time of this NES. However, if necessary, Caltrans would apply for an Incidental Take Permit pursuant to CESA and CFGC Section 2081.

5.4 Wetlands and Other Waters Coordination Summary

Potential wetlands, other waters of the United States and WOS regulated by USACE and RWQCB, and riparian areas and Coastal Zone wetlands regulated by the CCC, were mapped in the BSA during the September 2021 aquatic resource jurisdictional delineation report. The proposed project would result in temporary and permanent impacts to jurisdictional wetlands and WOTUS, as described in Table 4-4. Specific areas and volumes of impacts in that area will be estimated during the permit application project for a CWA Section 404 permit. A CWA Section 401 Water Quality Certification from the RWQCB and a CWA Section 404 permit from the USACE will be required for the proposed project's discharge into waters.

5.5 California Coastal Commission and CDFW Riparian Areas

The proposed project would have permanent or temporary impacts to LCP/CCC jurisdictional riparian areas, as described in Table 4-4. Specific impacts would be estimated during the application for a Coastal Development Permit from the LCP or CCC.

Construction work in the perennial and intermittent creek up to the top of bank, and any contiguous adjacent riparian habitat, also would require a CFGC Section 1602 Lake and Streambed Alteration Agreement from CDFW.

5.6 Invasive Species

The intent of EO 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." A discussed above in Chapter 3, invasive plant species are prevalent in the BSA, where they dominate the roadside vegetation and have a substantial impact on native plant vegetation and wildlife habitats. Invasive vegetation would be removed from the construction area, and BMPs to contain their spread would be implemented.

5.7 Other

No compensatory mitigation is proposed for this species of special concern because AMMs would reduce any potential impacts to a negligible level, and disturbed areas would be restored following construction.

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Appendix A Map of Project Features

AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM
Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

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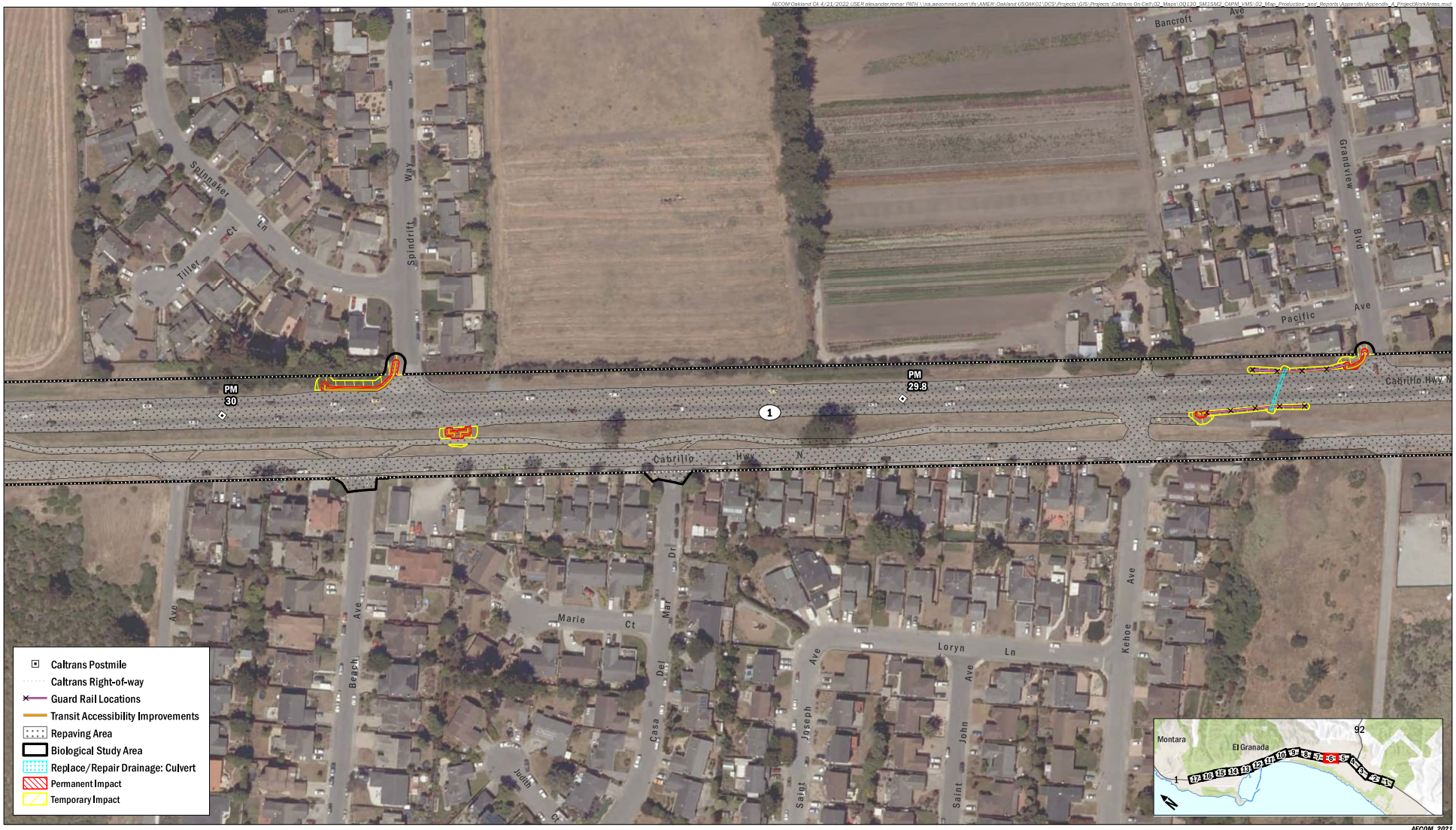

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Bordeaux Ln
Touraine Ln
Avignon Pl
Ruisseau Francais Ave
Frenchmans Creek Rd
Cabrillo Hwy N
1
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Valdez Blvd
Caltrans Postmile
Caltrans Right-of-way
Guard Rail Locations
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Biological Study Area
Temporary Impact
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Caltrans, 2021
San Mateo County Imagery, 2018

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San Mateo County Imagery, 2018

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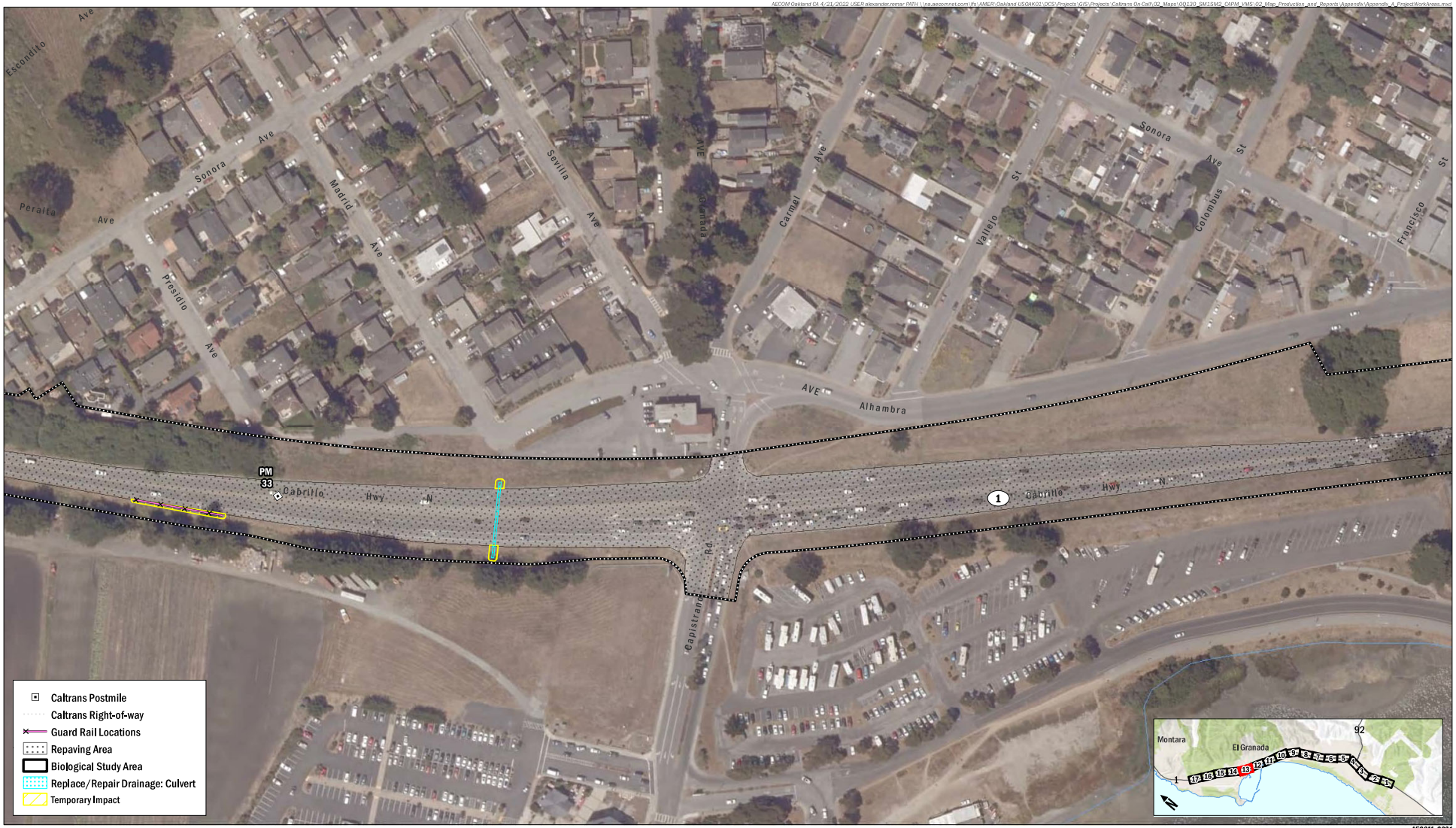

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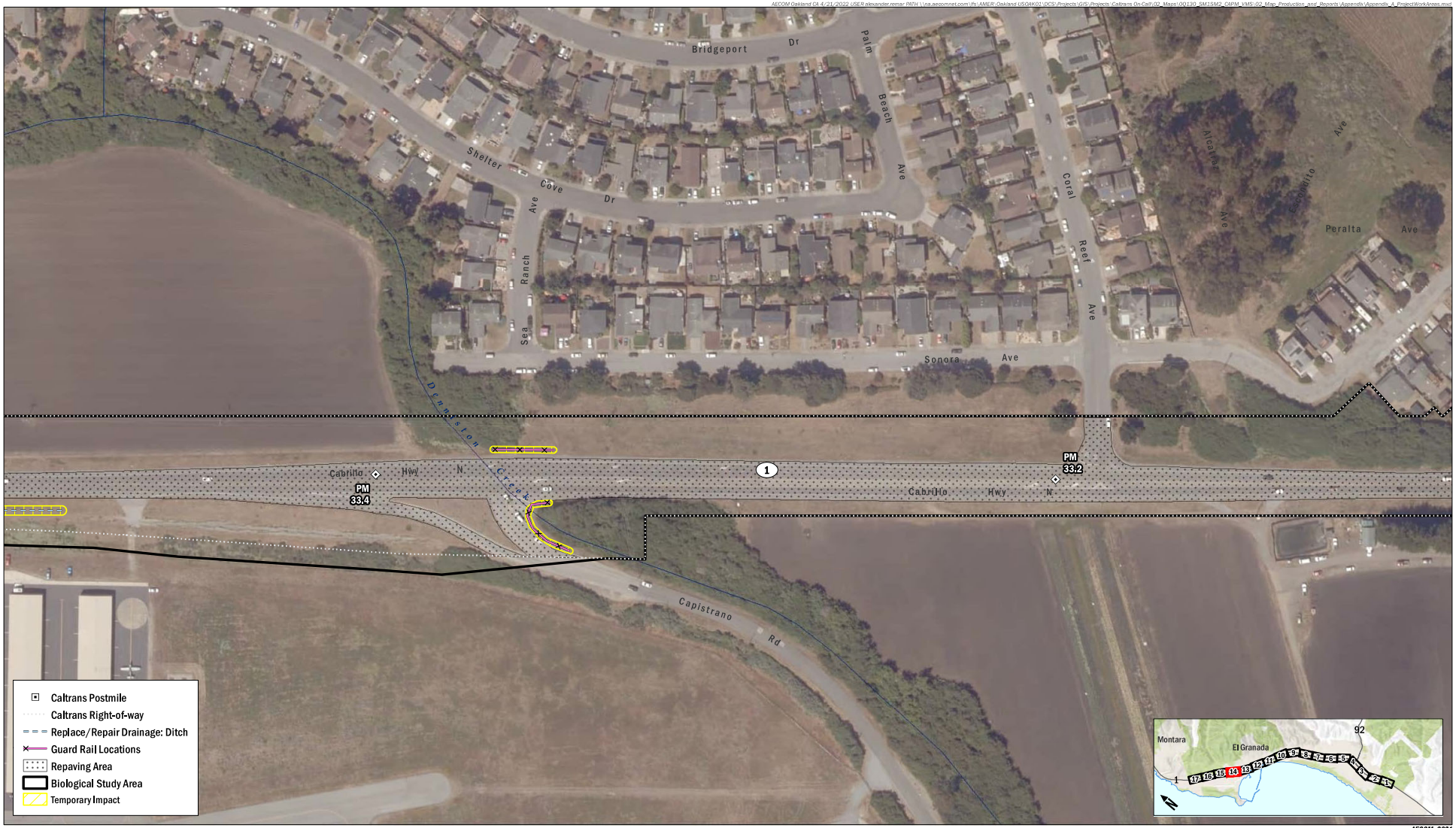
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

APPENDIX A

Project Work Areas



AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM
Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

APPENDIX A
Project Work Areas

AECOM Oakland CA 4/21/2022 USER alexander.remar PATH \\na.aecomnet.com\ifs\AMER\Oakland\SOAK01\DCS\Projects\GIS\Projects\Caltrans On-Call\02_Maps\0Q130_SM1SM2_CAPM_VMS\02_Map_Production_and_Reports\Appendix\Appendix_A_ProjectWorkAreas.mxd

AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM
Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
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Project Work Areas

AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM
Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

APPENDIX A

Project Work Areas

Appendix B USFWS and NMFS Species Lists

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: April 22, 2022
Project Code: 2022-0034779
Project Name: State Route 1 Multi-Asset Roadway Rehabilitation Project, PM 27.5/34.8

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 ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

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

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

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/birds/policies-and-regulations.php.

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/birds/bird-enthusiasts/threats-to-birds.php.

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/birds/policies-and-regulations/executive-orders/e0-13186.php.

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: 2022-0034779
Event Code: None
Project Name: State Route 1 Multi-Asset Roadway Rehabilitation Project, PM 27.5/34.8
Project Type: Road/Hwy - Maintenance/Modification
Project Description: San Mateo County, CA
The California Department of Transportation (Caltrans) proposes the State Route (SR) 1 Multi-Asset Roadway Rehabilitation Project (proposed project) to rehabilitate the existing pavement, improve existing traffic facilities, install complete streets elements, and install traffic operations system elements along SR 1 in San Mateo County, California. The proposed project would include pavement rehabilitation; replacing existing drainage inlets, culverts, and dikes; replacing existing guardrails with Midwest guardrail systems; replacing existing crash cushions; upgrading curb ramps; implementing complete street elements; upgrading signal poles; installing conduits; installing traffic operation system elements (intersection cameras, closed-circuit television cameras, variable message signs, and traffic monitoring stations); and relocating and/or replacing utility cabinets.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.4879598,-122.44942245162632,14z

Counties: San Mateo County, California

Endangered Species Act Species

There is a total of 14 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.

---

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.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4467	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. The location of the critical habitat is not available. 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
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. The location of the critical habitat is not available. 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

Flowering Plants

NAME	STATUS
Hickman's Potentilla *Potentilla hickmanii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6343	Endangered
San Mateo Woolly Sunflower *Eriophyllum latilobum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7791	Endangered
White-rayed Pentachaeta *Pentachaeta bellidiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7782	Endangered

Critical habitats

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

IPaC User Contact Information

Agency:	California Department of Transportation District 4
Name:	David Pecora
Address:	300 Lakeside Drive
Address Line 2:	Suite 400
City:	Oakland
State:	CA
Zip:	94612
Email	david.pecora@aecom.com
Phone:	5107546453

Pecora, David

From: Pecora, David
Sent: Thursday, April 21, 2022 7:40 PM
To: nmfs.wcrca.specieslist@noaa.gov
Subject: Caltrans State Route 1 Multi-Asset Roadway Rehabilitation Project, PM 27.5/34.8

The California Department of Transportation (Caltrans) proposes the State Route (SR) 1 Multi-Asset Roadway Rehabilitation Project (proposed project) to rehabilitate the existing pavement, improve existing traffic facilities, install complete streets elements, and install traffic operations system elements along SR 1 in San Mateo County, California. The proposed project would include pavement rehabilitation; replacing existing drainage inlets, culverts, and dikes; replacing existing guardrails with Midwest guardrail systems; replacing existing crash cushions; upgrading curb ramps; implementing complete street elements; upgrading signal poles; installing conduits; installing traffic operation system elements (intersection cameras, closed-circuit television cameras, variable message signs, and traffic monitoring stations); and relocating and/or replacing utility cabinets.

Quad Name **Montara Mountain OE W**
Quad Number **37122-E5**

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) - X

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
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - X
Chinook Salmon EFH -
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 the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - X
MMPA Pinnipeds - X

Quad Name **Half Moon Bay**
Quad Number **37122-D4**

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) - X

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
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH - X
Chinook Salmon EFH -
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 the NMFS Long Beach office
562-980-4000

MMPA Cetaceans - **X**

MMPA Pinnipeds - **X**

NOTE NEW PHONE # BELOW

David Pecora
he, him, his
Senior Biologist
973-525-9976
david.pecora@aecom.com

AECOM
300 Lakeside Drive, Suite 400
Oakland, CA 94612, U.S.
aecom.com

Built to deliver a better world

Appendix C Soil Survey Map of the BSA

AECOM
Caltrans District 4

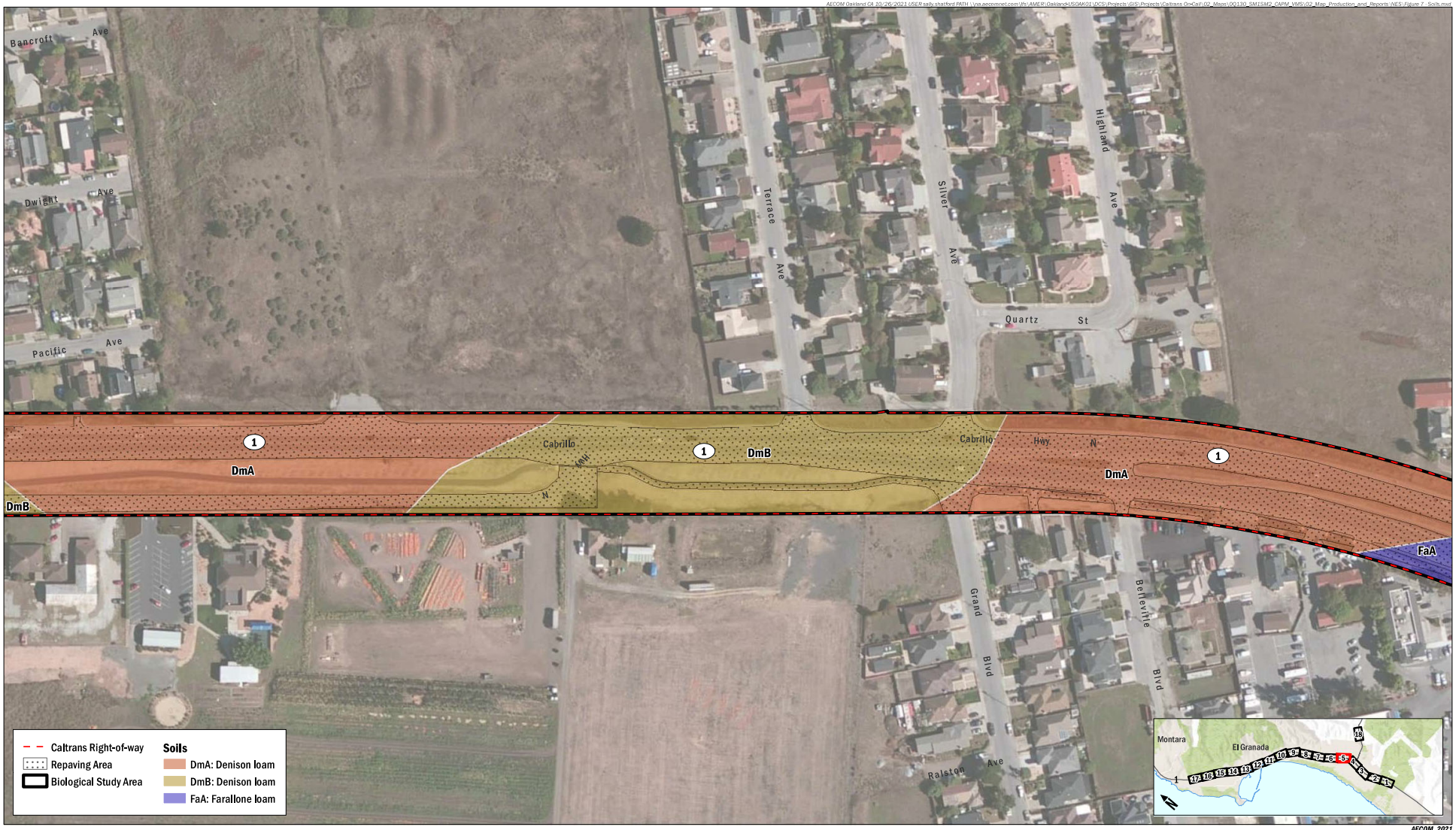
State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

Appendix B
NRCS Soils

AECOM, 2021
Caltrans, 2021
USDA, 1998
ESRI Basemap/Imagery, 2016/2021

AECOM, 2021
Caltrans, 2021
USDA, 1998
ESRI Basemap/Imagery, 2016/2021


AECOM Oakland CA 10/26/2021 USER sally.shatford PATH: \\na.aecomnet.com\fs\AMER\Oakland-USOAK01\DCS\Projects\GIS\Projects\Caltrans On-Call\02_Maps\0Q130_SM1SM2_CAPM_VMS\02_Map_Production_and_Reports\NES\Figure 7 - Soils.mxd
Lewis
Foster
Dr
N Main St
92
San Mateo Rd
Pilarcitos Creek
FcA
FaA
FcC2
Gu
DcA
BcA
DmA
1
Cabrillo Hwy N
Cabrillo Hwy S
Pilarcitos Ave
Oak Ave
Cypress Ave
Willow Ave
Pine Ave
Caltrans Right-of-way
Repaving Area
Biological Study Area
Soils
BcA: Botella clay loam
DcA: Denison clay loam
DmA: Denison loam
FaA: Farallone loam
FcA: Farallone coarse sandy loam
FcC2: Farallone coarse sandy loam
Gu: Gullied land (alluvial soil material)
Montara
El Granada
0
150
Feet
AECOM, 2021
Caltrans, 2021
USDA, 1998
ESRI Basemap/Imagery, 2016/2021



AECOM
Caltrans District 4

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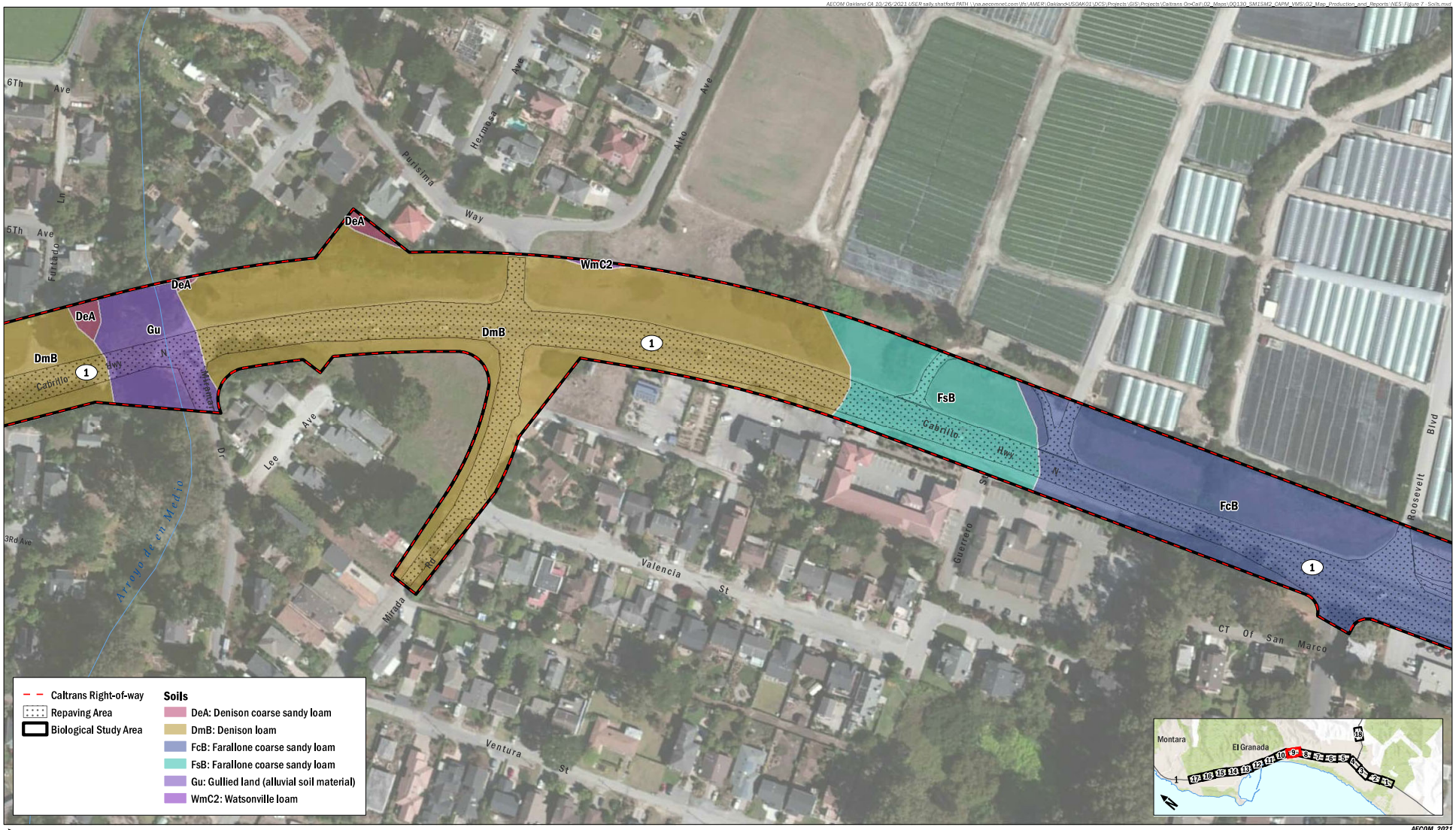

AECOM, 2021
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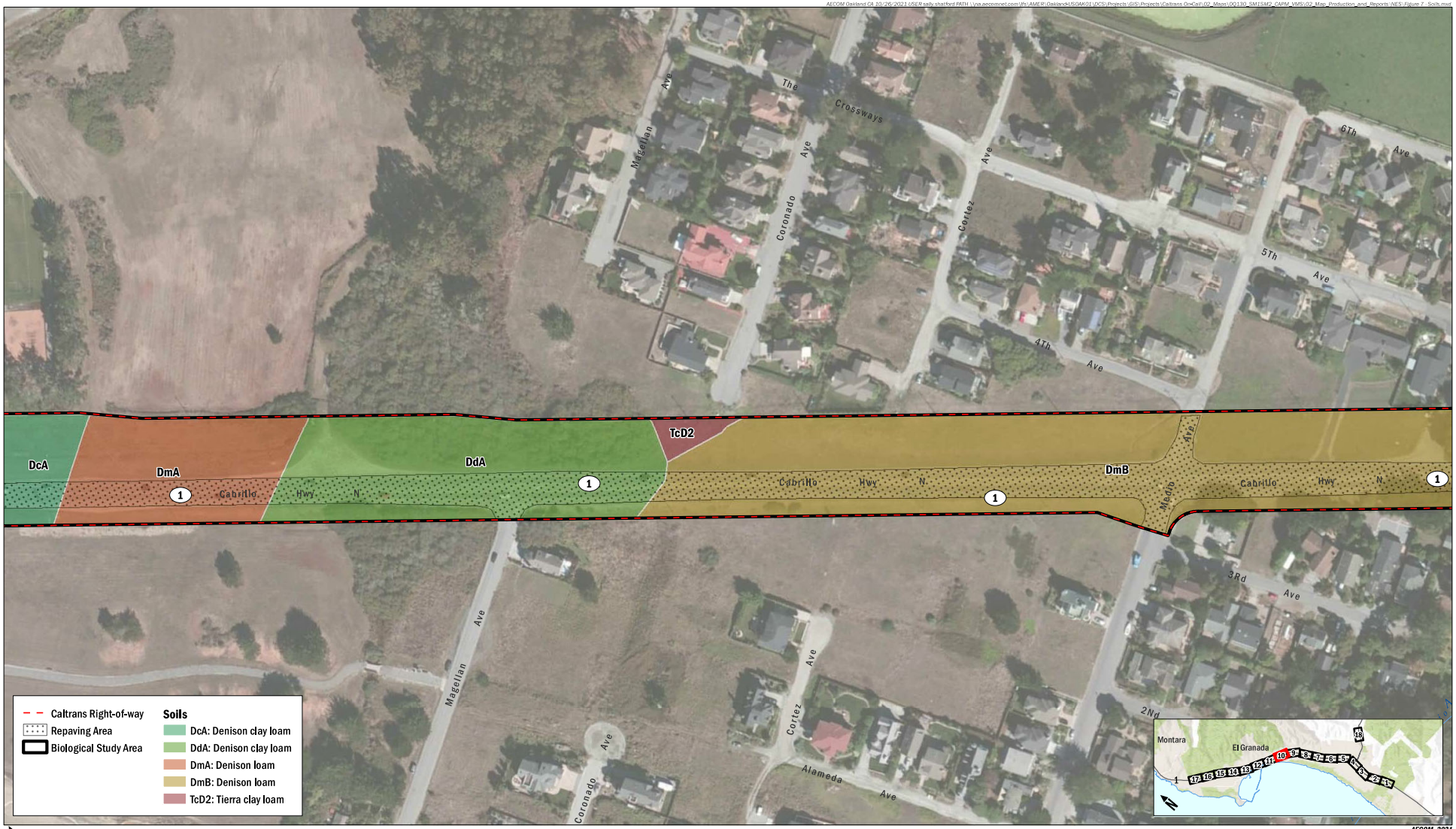

AECOM, 2021
Caltrans, 2021
USDA, 1998
ESRI Basemap/Imagery, 2016/2021

AECOM
Caltrans District 4

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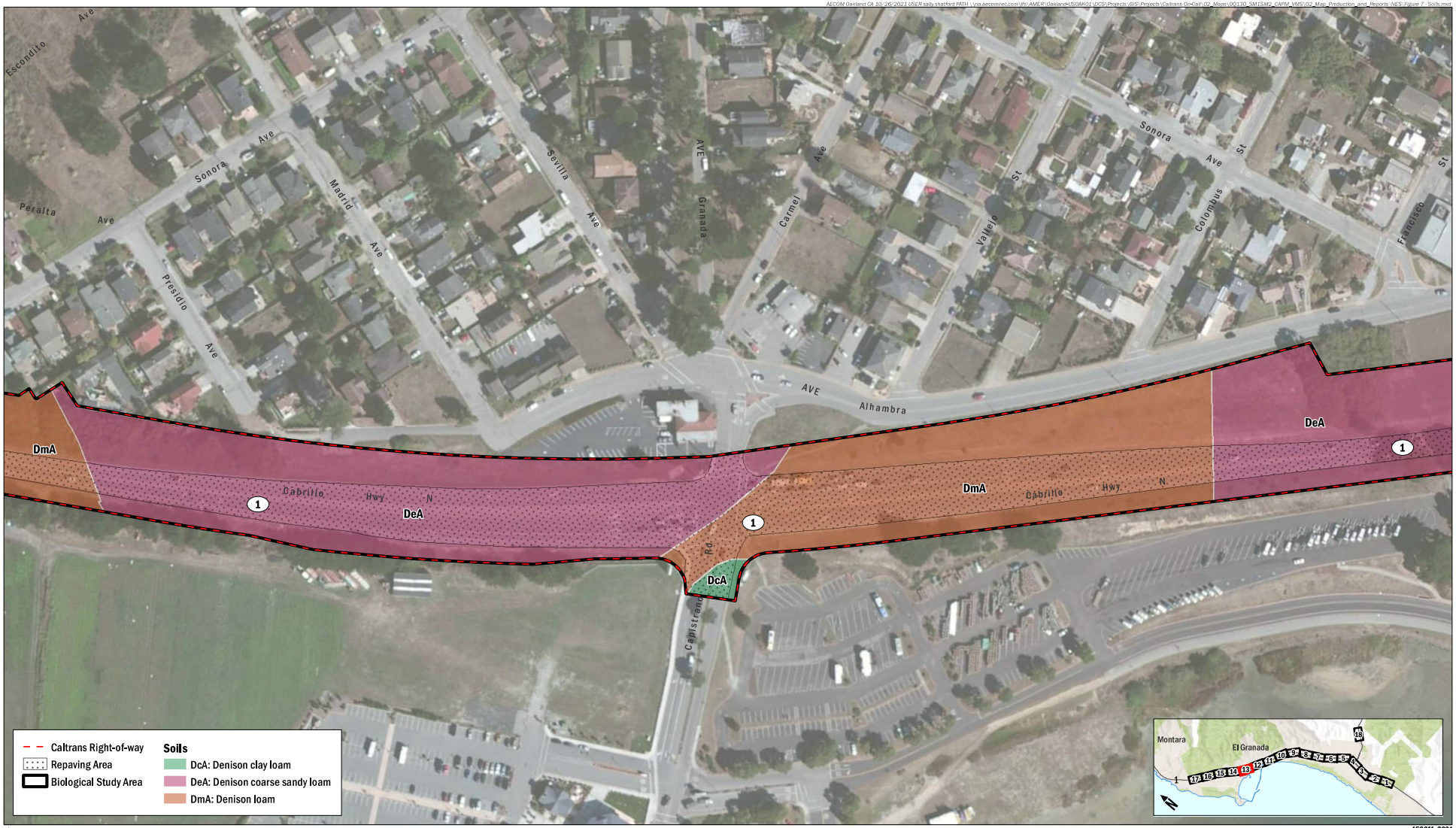

AECOM
Caltrans District 4

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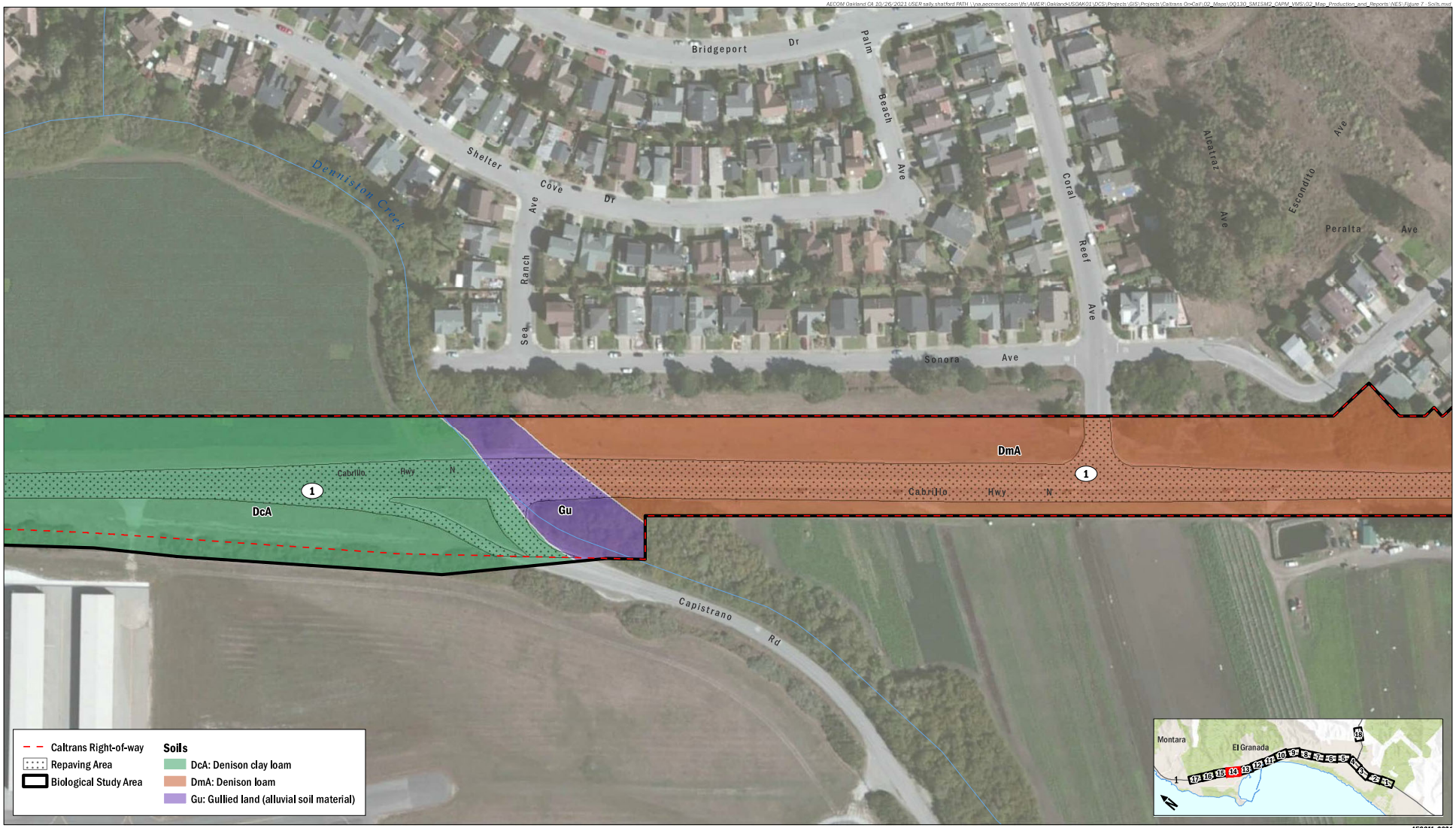

AECOM
Caltrans District 4

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Caltrans District 4

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Caltrans District 4

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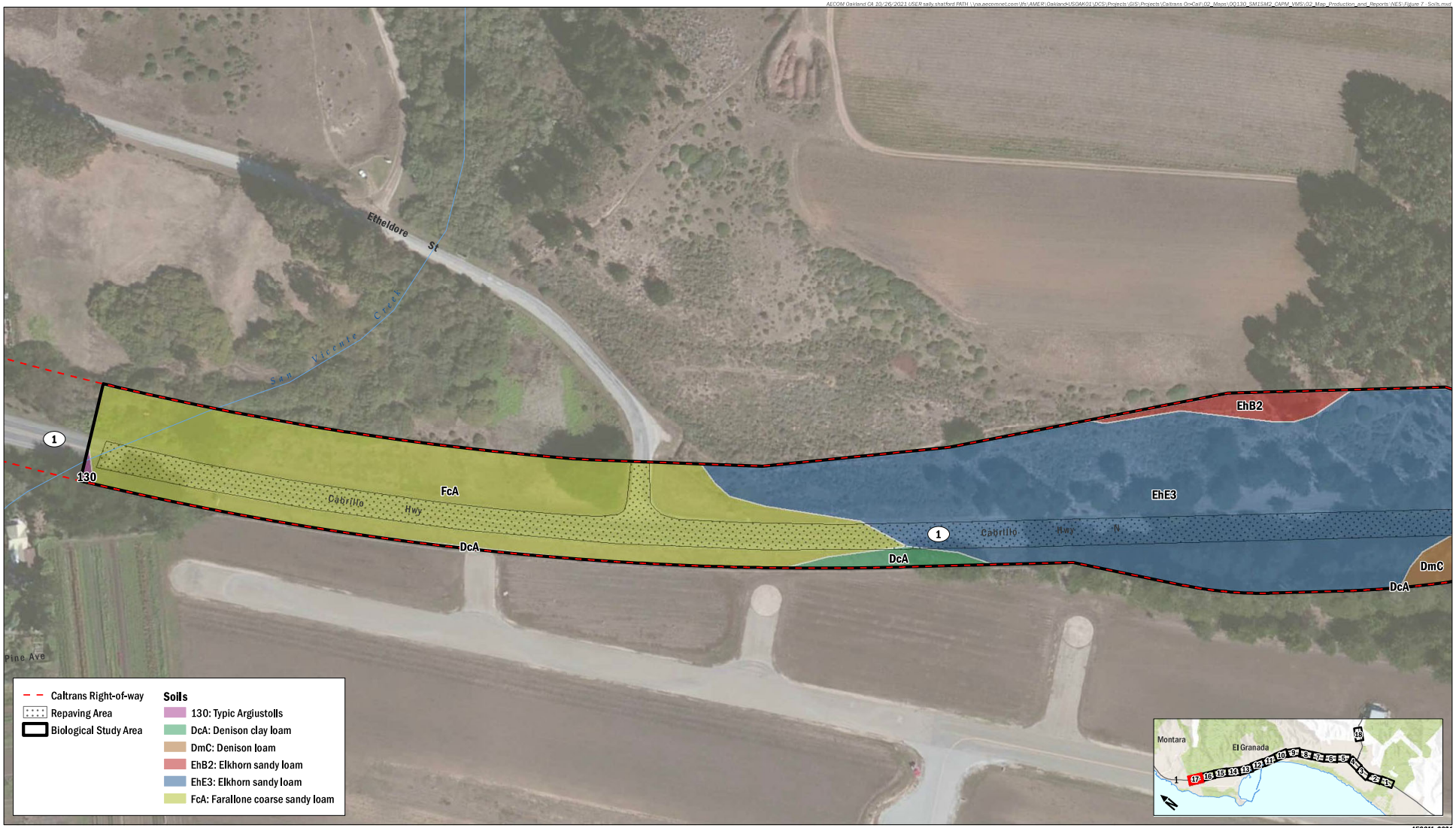

AECOM, 2021
Caltrans, 2021
USDA, 1998
ESRI Basemap/Imagery, 2016/2021

AECOM
Caltrans District 4

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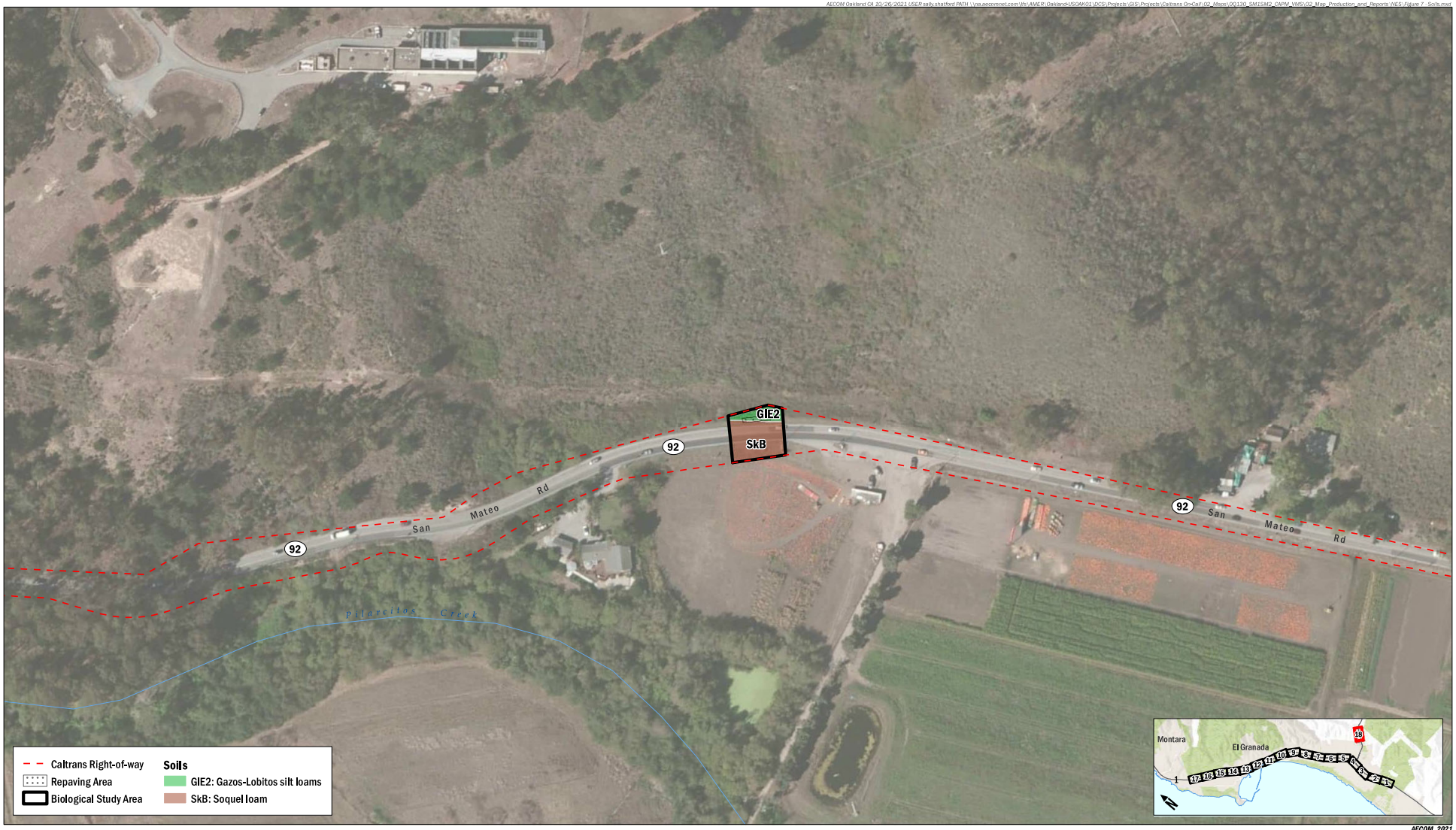

AECOM, 2021
Caltrans, 2021
USDA, 1998
ESRI Basemap/Imagery, 2016/2021

Appendix D Vegetation and Floristic Survey and Mapping Results

AECOM
300 Lakeside Drive
Suite 400
Oakland
CA 94612
aecom.com

Project name:

SM 1 Multi-Asset Roadway Rehabilitation Project

Project ref:

04-0Q130

To:

Gregory Pera
Senior Biologist
Caltrans District 4
111 Grand Ave
Oakland, CA 94612

CC:

Jessica Chavez, Caltrans Biologist
Kelly Ma, Caltrans Project Manager

From:

Dillon Lennebacker, AECOM Environmental Planner
Danny Slakey, AECOM Botanist

Date:

November 16, 2021

Memorandum

Subject: 0Q130 Vegetation and Floristic Survey and Mapping Results

The California Department of Transportation District 4 Office of Biological Science and Permitting requested that AECOM conduct floristic surveys, map vegetation, and provide a vegetation habitat description for the 0Q130 SM-1 Multi-Asset Roadway Rehabilitation Project (project). This memorandum provides the results of these requested tasks.

Methods

A floristic survey and a vegetation survey were conducted by AECOM biologists Danny Slakey and Joe Bandel on September 7, 8, and 15, 2021, along State Route (SR) 1 in the project area. All water crossings and areas subject to off-pavement disturbance from the project, as well as a 50-foot buffer of these areas, were observed visually in foot surveys.

Floristic surveys were conducted only at the water crossings and areas subject to off-pavement disturbance. All vascular plant species observed were identified to the species or infrataxon (subspecies or variety) level when possible. However, because the surveys were conducted in the late summer, many species could only be identified to the genus or family level. Some species were likely not detectable at all because annual species may have senesced beyond the point of recognition prior to survey dates. It would be necessary to conduct an additional two to three surveys between the late winter and early summer months to capture a complete inventory of the plant species present in the biological study area (BSA). Plants were identified using the taxonomy currently recognized in the Jepson eFlora database (Jepson Flora Project 2021).

A vegetation map and detailed vegetation habitat descriptions were prepared for the project BSA using a combination of field surveys and desktop review. Vegetation was mapped and described based on field surveys at water crossings and areas subject to off-pavement disturbance. In all other parts of the BSA, vegetation was mapped using a combination of aerial imagery and Google (2021) street view imagery. Vegetation was mapped to the vegetation alliance level using the California Native Plant Society (CNPS) *Manual of California Vegetation* (CNPS 2021a) classification system where possible. For communities that could be consistently identified to the association level throughout the BSA, the

vegetation association was also recorded in the vegetation habitat descriptions. The presence of invasive species, defined as those included on the California Invasive Plant Council (Cal-IPC) (2021) inventory of invasive plants, was noted for vegetation communities on the field surveys. Additional nonnative species that are not ranked by Cal-IPC (2021) but appeared to be problematic invasive species in the BSA are also discussed in the community descriptions where applicable. Cal-IPC's (2021) invasive plant rankings are defined as follows:

- High: species with severe ecological impacts
- Moderate: substantial and apparent, but not severe, ecological impacts
- Limited: minor ecological impacts, or information on them is limited
- Watch: at a high risk of becoming invasive in the future

Results

Plant List

A total of 128 plant taxa were identified during floristic surveys conducted for this memorandum. They include a mix native and nonnative species, invasive species, wetland species, and upland species. The list of plant species observed in the BSA is included as Appendix A, Table A-1. The plant list denotes the native status, invasive status, and Western Mountains, Valleys, and Coast wetland indicator ranking for plants identified in the BSA. Several species could only be identified to the genus level, as noted in Table A-1.

No special status species were observed in the BSA. However, Ornduff's meadowfoam, a California Rare Plant Rank (CRPR) 1B.1[1] special status plant, is mapped in the California Natural Diversity Database (CDFW 2021a) as overlapping agricultural fields on the northeastern side of SR 1 in the BSA. Ornduff's meadowfoam is known globally from only two occurrences, both of which are in Half Moon Bay. CDFW (2021a) and CNPS (2021b) note that this plant grows in meadows and seeps as well as agricultural fields. The occurrence in the BSA grows in saturated soils in narrow ditches of the agricultural field (CDFW 2021a), and therefore may depend on poor drainage on the eastern side of SR 1 for its continued survival in this location. Ornduff's meadowfoam, if present, would not have been detectable at the time of survey, because it is an annual plant that germinates after the onset of fall rains and flowers from November to May (CNPS 2021b). Additionally, several other special-status plants (defined here as plants ranked CRPR 1A, 1B, 2A, or 2B2,[2] as well as state and federally listed species) have potential to occur in the BSA and have known occurrences mapped nearby but would not have been detectable at the time of survey. Two to three surveys conducted between the late winter and early summer would be needed to detect all special-status plants with potential to occur in the BSA.

Vegetation Community Map and Descriptions

Vegetation community descriptions are summarized in Table 1 and described in detail in this section. Appendix B (Figure B-1) includes vegetation mapping completed for the project. Vegetation community descriptions include the vegetation alliance name, association name (when a single association from that alliance is present in the BSA), description of dominant and associated species, description of abundant and noteworthy invasive species in the community, and the community's global (G) and state (S) rankings. Communities with ranks S1 through S3 are considered sensitive natural communities (CDFW 2021b).

[1] The CRPR of 1B.1 indicates a plant that it is rare, threatened, or endangered in California and elsewhere (CNPS 2021b)
[2] Other CRPR ranks are defined as follows by CNPS (2021b):
1A: plants presumed extirpated in California and either rare or extinct elsewhere
2A: plants presumed extirpated in California but common elsewhere.
2B: plants rare, threatened or endangered in California but more common elsewhere

Table 1. Natural Communities Present in the BSA

Community Type	Common Name	Scientific Name	Ranking[1,2]
Herbaceous wetland communities	Duckweed blooms	*Lemna* (*minor*) and relatives	*G5S4?*
	Seasonal herbaceous wetland	—	—
	Water parsley marsh	*Oenanthe sarmentosa*	*G4S2?*
Herbaceous upland communities	Ice plant mats	*Mesembryanthemum* spp. – *Carpobrotus* spp.	*GNASNA*
	Poison hemlock or fennel patches	*Conium maculatum – Foeniculum vulgare*	*GNASNA*
	Upland mustards or star thistle fields	*Brassica nigra – Centaurea* (*solstitialis, melitensis*)	*GNASNA*
	Wild oats and annual brome grasslands	*Avena* spp. – *Bromus* spp.	*GNASNA*
Shrub-dominated communities	Arroyo willow thicket	*Salix lasiolepis*	*G4S4*
	California coffee berry – western azalea – Brewer's willow scrub	*Frangula californica – Rhododendron occidentale – Salix breweri*	*G3S3*
	California sagebrush – (purple sage) scrub	*Artemisia californica – (Salvia leucophylla)*	*G5S5*
	Coyote brush scrub	*Baccharis pilularis*	*G5S5*
	Himalayan blackberry – rattlebox – edible fig riparian scrub	*Rubus armeniacus – Sesbania punicea – Ficus carica*	*GNRSNR*
	Poison oak scrub	*Toxicodendron diversilobum*	*G4S4*
	Salal – berry brambles	*Gaultheria shallon – Rubus (ursinus)*	*GNRS4*
Tree-dominated communities	Acacia woodland[3]	*Acacia* spp. – *Grevillea* spp. – *Leptospermum laevigatum* (pending)	—
	Eucalyptus – tree of heaven – black locust groves	*Eucalyptus spp. – Ailanthus altissima – Robinia pseudoacacia*	*GNASNA*
	Goodding's willow – red willow riparian woodland and forest	*Salix gooddingii – Salix laevigata*	*G4S3*
	Monterey cypress – Monterey pine stands	*Hesperocyparis macrocarpa – Pinus radiata*	*GNASNA*
	Red alder forest	*Alnus rubra*	*G5S4*
Developed communities and unvegetated areas	Agricultural cropland	—	—
	Landscaped areas	—	—
	Urban	—	—

Notes:

[1] Community rankings are defined by NatureServe (2021) as follows, with the rankings applying to the community's status globally (G rank) and within the state of California (S Rank):

1: critically imperiled
2: imperiled:
3: vulnerable
4: apparently secure
5: secure
NA: not assessed
NR: not ranked
?: inexact numeric rank (not enough information)

Communities with "—" in the Ranking column have no ranking because they are not recognized by CNPS (2021a).

[2] Communities with S Rankings between S1 and S3 are considered sensitive natural communities.

[3] Acacia woodland does not have a G or S ranking because it is pending inclusion in the *Manual of California Vegetation* (CNPS 2021a). It will not be ranked as a sensitive natural community because it is dominated by nonnative species.

Herbaceous Wetland Plant Communities

Duckweed Blooms

Duckweed blooms occur in the BSA at a single site along northbound SR 1. This area has a small patch of standing water with cover consisting only of duckweed (*Lemna* sp.). The duckweed was not identified to the species level, but all members of this genus occurring in California are considered native (Calflora 2021). No invasive species are present in this community. The duckweed bloom in the BSA is surrounded by seasonal herbaceous wetland. This community is ranked *G5S4?*.

Seasonal Herbaceous Wetland

Seasonal herbaceous wetlands in the BSA could not be identified to the vegetation alliance level in CNPS (2021a) due to this community's poor fit for previously described vegetation alliances. These wetlands have relatively sparse vegetative cover with several codominant species, including tall cyperus (*Cyperus eragrostis*), bristly ox-tongue (*Helminthotheca echioides*; Cal-IPC limited), curly dock (*Rumex crispus*; Cal-IPC limited), willow dock (*Rumex transitorius*), and Pacific aster (*Symphyotrichum chilense*). Only invasive species ranked as limited by Cal-IPC were observed in this community. Because this community cannot be assigned to an alliance in the *Manual of California Vegetation* (CNPS 2021a), it does not have a G or S rank.

Water Parsley Marsh

Water parsley marsh occurs at a single wetland in the BSA. This community is dominated by water parsley (*Oenanthe sarmentosa*) and dotted smartweed (*Persicaria punctata*), with few other species present. Invasive plant species present in this community include garden nasturtium (*Tropaeolum majus*) and English ivy (*Hedera helix*; Cal-IPC high). Garden nasturtium is not a Cal-IPC-rated invasive plant, but it can invade shaded or moist areas (Jepson Flora Project 2021) and is dominant on the edges of this habitat. Water parsley marsh is ranked *G4S2?*, making it a sensitive natural community.

Herbaceous Upland Plant Communities

Ice Plant Mats

Ice plant mats occur in small patches at several locations in the BSA. This community is dominated by ice plant (*Carpobrotus edulis*; Cal-IPC high). Few other species occur in this community, with the exception of a few nonnative annual grasses that are also present in the wild oat and annual brome grasslands community. Although ice plant is an invasive species of concern, this plant is relatively uncommon throughout the BSA and only forms relatively small patches. This community is ranked *GNASNA*.

Poison Hemlock or Fennel Patches

Poison hemlock or fennel patches occur in disturbed areas throughout the BSA, both in uplands and at the margins of wetlands. Most of this community in the BSA is dominated by poison hemlock (*Conium maculatum*; Cal-IPC moderate), but there are several patches that are dominated by fennel (*Foeniculum vulgare*; Cal-IPC moderate). Nonnative annual grasses found in the wild oats and annual brome grasslands community are also present at moderate cover. This community intergrades with the other disturbed herbaceous communities described in this section. This community is ranked *GNASNA*.

Upland Mustards or Star Thistle Fields

In the BSA, this community is represented by upland mustards exclusively; no star thistle (*Centaurea* spp.) plants were observed in the BSA. This community is dominated by black mustard (*Brassica nigra*; Cal-IPC moderate), hoary mustard (*Hirschfeldia incana*; Cal-IPC moderate), and in some areas jointed charlock (*Raphanus sativus*; Cal-IPC limited). This community also has a moderate cover of nonnative annual grasses that are more dominant in the wild oats and annual brome grasslands community. This community intergrades with the other disturbed herbaceous communities described in this section. This community is ranked *GNASNA*.

Wild Oats and Annual Brome Grasslands

Wild oat and annual brome grasslands are the most common plant community found in the BSA, occupying the bulk of the land cover in areas lacking trees, shrubs, or pavement. This community is dominated by nonnative grasses, including slender oat (*Avena barbata*; Cal-IPC moderate), rescue grass (*Bromus catharticus*), soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis*), Italian ryegrass (*Festuca perennis*; Cal-IPC moderate), velvet grass (*Holcus lanatus*; Cal-IPC moderate), kikuyu grass (*Pennisetum clandestinum*; Cal-IPC limited), and Harding grass (*Phalaris aquatica*; Cal-IPC moderate). Several nonnative forbs are also associated with this community, including bristly ox-tongue (Cal-IPC limited), flax (*Linum bienne*), annual mercury (*Mercurialis annua*), ribwort (*Plantago lanceolata*; Cal-IPC limited), and pincushions (*Scabiosa atropurpurea*; Cal-IPC watch). Cover of pincushions is dense in sections of the BSA, but there are few records of this species from coastal San Mateo County (Jepson Flora Project 2021). A few native species, such as salt grass (*Distichlis spicata*), willow herb (*Epilobium brachycarpum*), California poppy (*Eschscholzia californica*), and coastal tarweed (*Madia sativa*), are present at low cover in the grasslands. Andean pampas grass (*Cortaderia jubata*; Cal-IPC high) occurs in several small patches throughout the grasslands, but in areas too small to be mapped as a separate vegetation community. The grasslands in the BSA intergrade with the other disturbed herbaceous communities in the BSA, and these communities have many of the same invasive species in common. This community is ranked *GNASNA*.

Shrub-Dominated Plant Communities

Arroyo Willow Thickets

Arroyo willow thickets occur in mesic sites throughout the BSA, including riparian areas and roadside ditches. This community is dominated by arroyo willow (*Salix lasiolepis*) and has a shrub/vine layer in places that includes California blackberry (*Rubus ursinus*), California coffee berry (*Frangula californica*), coyote brush (*Baccharis pilularis*), American dogwood (*Cornus sericea*), and red elderberry (*Sambucus racemosa*). Understory plants are present mostly on the margins of this community, and include Pacific aster, yarrow (*Achillea millefolium*), mugwort (*Artemisia douglasiana*), coast rush (*Juncus hesperius*), and spreading rush (*Juncus patens*). Arroyo willow thickets in the BSA generally have a very dense cover of native woody species, with few invasive species present; but on their edges, this community intergrades with grasslands and other disturbed herbaceous communities. The edges of the arroyo willow thickets therefore have a low density of the same invasive species found in the disturbed herbaceous communities, such as poison hemlock, fennel, Andean pampas grass, hoary mustard, black mustard, and nonnative annual grasses. This community is ranked *G4S4*.

California Coffee Berry – Western Azalea – Brewer's Willow Scrub

California coffee berry – western azalea – Brewer's willow scrub occurs in only two small patches in the BSA, and only the California coffee berry association is present in the BSA. This community is dominated by California coffee berry, with no other shrubs present. There is little to no understory in

this community, owing to the very dense cover of California coffee berry shrubs. This community is ranked *G3S3*, making it a sensitive natural community.

California Sagebrush – (Purple Sage) Scrub

California sagebrush – (purple sage) scrub occurs in a single patch in the BSA, and is represented by the California sagebrush association. This community is dominated by California sagebrush (*Artemisia californica*), with no co-occurring shrubs; it is associated with nonnative annual grasses. No invasive species were identified in this community, although it is expected that some nonnative annual grasses ranked limited or moderate by Cal-IPC (2021) are likely present. California sagebrush – (purple sage) scrub is ranked *G5S5*.

Coyote Brush Scrub

Coyote brush scrub is found in several locations throughout the BSA. This community is dominated by coyote brush, including both upright (var. *pilularis*) and prostrate (var. *consanguinea*) forms, and is associated with several native shrubs and herbs, including California coffee berry, California blackberry, poison oak (*Toxicodendron diversilobum*), California bee plant (*Scrophularia californica*), Pacific aster, and spreading rush. Most coyote brush scrub vegetation in the BSA has few invasive species, but some invasive plants are present on its peripheries, particularly poison hemlock (Cal-IPC moderate). Coyote brush scrub is ranked *G5S5*.

Himalayan Blackberry – Rattlebox – Edible Fig Riparian Scrub

Himalayan blackberry – rattlebox – edible fig riparian scrub occurs in a single patch in a roadside ditch along the northbound side of SR 1, and only the Himalayan blackberry association is present in the BSA. Although this community is not in a riparian zone, the site is likely more mesic than surrounding grasslands due to its location in a ditch. This community is dominated by Himalayan blackberry (*Rubus armeniacus*; Cal-IPC high) and is associated with coyote brush and nonnative annual grasses. This area is mowed on a regular basis, so the Himalayan blackberry and coyote brush only grow very close to the ground; if mowing were to cease, these plants would likely form a dense thicket in this area. The mowing may help to slow the spread of the invasive Himalayan blackberry both by preventing seed set and slowing down its spread via vegetative growth. This community is ranked *GNRSNR*.

Poison Oak Scrub

Poison oak scrub occurs in the BSA only at the location along SR 92. This community is dominated by poison oak and is associated with California blackberry and California bee plant. Although this community has a very high cover of native shrubs, it has a small infestation of Andean pampas grass (Cal-IPC high). Poison oak scrub is ranked *G4S4*.

Salal – Berry Brambles

Salal – berry brambles occur in a few patches in the BSA, at a mesic site along a ditch and in riparian areas; this community is represented by the California blackberry association in the BSA. Salal – berry brambles in the BSA are dominated by California blackberry, and are associated with common horsetail (*Equisetum arvense*), stinging nettle (*Urtica dioica*), and Pacific aster. Some nonnative annual grasses are found in this community. This community is ranked *GNRS4*.

Tree-Dominated Plant Communities

Acacia Woodland

Acacia woodlands occur in the BSA in the riparian zone at Arroyo de en Medio. This community is dominated by a canopy of blackwood acacia (*Acacia melanoxylon*; Cal-IPC limited) and several red elderberry shrubs, with an understory dominated by invasive plants, including garden nasturtium, English ivy (Cal-IPC high), Cape ivy (*Delairea odorata*; Cal-IPC high), and upright veldt grass (*Ehrharta erecta*; Cal-IPC moderate). Some large blue gum (*Eucalyptus globulus*) trees had recently dominated the tree canopy but were cut shortly before the survey, resulting in these areas being mapped as acacia woodlands.

Eucalyptus – Tree of Heaven – Black Locust Groves

Eucalyptus – tree of heaven – black locust groves are found in several riparian and upland areas throughout the BSA and are represented in the BSA by the eucalyptus association. This community is dominated by blue gum (Cal-IPC limited) trees, many of which are mature, large specimens. Smaller trees and shrubs are present below the blue gum canopy, including blackwood acacia and red elderberry. Understories in this community are similar to those found in acacia woodlands, and are dominated by garden nasturtium, English ivy (Cal-IPC high), and Cape ivy (Cal-IPC high), with some upright veldt grass also present. This community is ranked *GNASNA*.

Goodding's Willow – Red Willow Riparian Woodland and Forest

Goodding's willow – red willow riparian forest and woodland occurs in the BSA only at Frenchman's Creek, and is represented in the BSA by the red willow association. This community is dominated by red willow (*Salix laevigata*) and is surrounded by a eucalyptus grove. The understory includes a mix of natives and nonnative, including red elderberry, California blackberry, stinging nettle, English ivy (Cal-IPC high), and Cape ivy (Cal-IPC high). This community is ranked *G4S3*, making it a sensitive natural community.

Monterey Cypress – Monterey Pine Stands

Monterey cypress – Monterey pine stands occur in upland areas throughout the BSA. Monterey cypress (*Hesperocyparis macrocarpa*) is the dominant tree in this community, but several Monterey pine (*Pinus radiata*) trees are present in low numbers in parts of the BSA. Due to the dense canopies of Monterey cypress trees and their tendency to form low-growing branches, this community generally has a very sparse understory with few species. In areas where the lowest branches have been trimmed, nonnative annual grasses tend to dominate the understory. Monterey cypress and Monterey pine were either planted or naturalized throughout the BSA because their native ranges are restricted to the vicinity of the Monterey Peninsula. This community is ranked *GNASNA*.

Red Alder Forest

Red alder forest is found in the BSA only in the riparian area at Pilarcitos Creek. This community is dominated by red alder (*Alnus rubra*) and is associated with arroyo willow, Pacific willow (*Salix lasiandra*), and California blackberry. Invasive species were not observed in this community, but may be present in the understory because this community was only observed from the elevated roadway. This community is ranked *G5S4*.

Developed Plant Communities and Unvegetated Areas

Agricultural Cropland

Agricultural cropland in the BSA consists of areas managed for annual herbaceous crops; those observed at the time of survey include Brussels sprouts (*Brassica oleracea* 'gemmifera) and field pumpkin (*Cucurbita pepo*), with a sparse cover of nonnative annual grasses in some areas of cropland. Agricultural cropland in the BSA is known to support a population of Ornduff's meadowfoam (CRPR 1B.1; CDFW 2021a) but would not have been detectable at the time of survey, as discussed in the plant list results section. Poor drainage of the agricultural croplands in the BSA may contribute to the mesic conditions associated with Ornduff's meadowfoam.

Landscaped Areas

Landscaped areas in the BSA include areas dominated by trees, shrubs, and herbaceous plants. This community was mapped in areas dominated by nonnative plants that could not be assigned to another community, as well as in areas dominated by California native plants that were obviously planted and may not be native to the immediate vicinity of the BSA. Common plants in landscaped areas of the BSA include silktree (*Albizia julibrissin*), ornamental pines (*Pinus* sp.), prickly pear (*Opuntia ficus-indica*), aloes (*Aloe* sp.), and several natives, including deergrass (*Muhlenbergia rigens*), California lilac (*Ceanothus* sp.), and California fuchsia (*Epilobium canum*). Although landscaped areas are dominated by nonnative species, few of the species in these areas are considered invasive. Some of the common invasive annual grasses and forbs present in the wild oats and annual brome grasslands are present in low densities in landscaped areas.

Urban

Urban land cover in the BSA consists of paved and graveled roads, riprapped shoreline areas, buildings, and other human-built structures. Few plant species are present in these areas.

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Appendix A . 0Q130 Plant List

Table A-1. Plant Species List of the BSA

Scientific Name	Common Name	Native Status	WMVC Wetland Rating[1]	Cal-IPC Rating[2]
Acacia melanoxylon	blackwood acacia	nonnative		limited
Achillea millefolium	yarrow	native	FACU	
Agapanthus africanus[3]	lily of the Nile	nonnative		
Albizia julibrissin[3]	silktree	nonnative		
Aloe sp.[3]	unknown aloe	nonnative		
Amaranthus powellii	Powell's amaranth	native		
Amaryllis belladonna[3]	naked lady	nonnative		
Apiaceae sp.[4]	unknown carrot family	unknown		
Artemisia californica	coastal sage brush	native		
Artemisia douglasiana	California mugwort	native	FACW	
Atriplex prostrata	fat-hen	nonnative	FAC	
Avena barbata	slender oat	nonnative		moderate
Baccharis pilularis	coyote brush	native		
Brassica nigra	black mustard	nonnative		moderate
Brassica oleracea 'gemmifera'[3]	Brussels sprouts	nonnative		
Bromus catharticus	rescue grass	nonnative		
Bromus hordeaceus	soft chess	nonnative	FACU	limited
Bromus madritensis	foxtail chess	nonnative	FACU	
Capsella bursa-pastoris	shepherd's purse	nonnative	FACU	
Cardamine oligosperma	Idaho bittercress	native	FAC	
Carduus pycnocephalus	Italian thistle	nonnative		moderate
Carex subbracteata	small bract sedge	native	FACW	
Carpobrotus edulis	iceplant	nonnative		high
Ceanothus sp.[3,4]	unknown California lilac	native		
Chasmanthe floribunda	chasmanthe	nonnative		
Chenopodium album	lambs quarters	nonnative	FACU	
Cirsium vulgare	bullthistle	nonnative	FACU	moderate
Conium maculatum	poison hemlock	nonnative	FAC	moderate
Convolvulus arvensis	field bindweed	nonnative		
Cornus sericea	American dogwood	native		
Cortaderia jubata	Andean pampas grass	nonnative	FACU	high
Cotoneaster franchetii	cotoneaster	nonnative		moderate
Cucurbita pepo[3]	field pumpkin	nonnative		
Cynodon dactylon	Bermuda grass	nonnative	FACU	moderate
Cynosurus echinatus	dogtail grass	nonnative		moderate

Scientific Name	Common Name	Native Status	WMVC Wetland Rating[1]	Cal-IPC Rating[2]
Cyperus eragrostis	tall cyperus	native	FACW	
Daucus carota	carrot	nonnative	FACU	
Delairea odorata	Cape ivy	nonnative		high
Dipsacus sativus	Indian teasel	nonnative		moderate
Distichlis spicata	salt grass	native	FACW	
Ehrharta erecta	upright veldt grass	nonnative		moderate
Epilobium brachycarpum	willow herb	native		
Epilobium canum[3]	California fuchsia, zauschneria	native		
Epilobium ciliatum	slender willow herb	native	FACW	
Epilobium densiflorum	willow herb	native	FACW	
Equisetum arvense	common horsetail	native	FAC	
Erigeron glaucus	seaside daisy	native	FACU	
Erigeron sumatrensis	tropical horseweed	nonnative		
Eschscholzia californica	California poppy	native		
Eucalyptus globulus	blue gum	nonnative		limited
Euthamia occidentalis	western goldenrod	native	FACW	
Festuca bromoides	brome fescue	nonnative		
Festuca perennis	Italian rye grass	nonnative		moderate
Foeniculum vulgare	fennel	nonnative		moderate
Fragaria chiloensis	beach strawberry	native	FACU	
Frangula californica	California coffeeberry	native		
Fumaria capreolata	white ramping fumitory	nonnative		
Geranium core-core	Alderney crane's-bill	nonnative		
Geranium dissectum	wild geranium	nonnative		limited
Geranium robertianum	Robert's geranium	nonnative	FACU	
Glebionis coronaria	crown daisy	nonnative		limited
Grindelia stricta var. *platyphylla*	gumplant	native	FACW	
Hedera helix	English ivy	nonnative	FACU	high
Helminthotheca echioides	bristly ox-tongue	nonnative	FAC	limited
Hesperocyparis macrocarpa[5]	Monterey cypress	nonnative		
Hirschfeldia incana	hoary mustard	nonnative		moderate
Holcus lanatus	common velvetgrass	nonnative	FAC	moderate
Hypochaeris radicata	hairy cats ear	nonnative	FACU	moderate
Ipomoea purpurea	common morning glory	nonnative	UPL	
Juncus hesperius	coast rush	native		
Juncus patens	spreading rush	native	FACW	
Lactuca serriola	prickly lettuce	nonnative	FACU	
Lemna sp.	unknown duckweed	native	OBL	
Leptospermum laevigatum	Australian tea tree	nonnative		

Scientific Name	Common Name	Native Status	WMVC Wetland Rating[1]	Cal-IPC Rating[2]
Ligustrum lucidum	glossy privet	nonnative		limited
Linum bienne	flax	nonnative		
Lobularia maritima	sweet alyssum	nonnative		limited
Lotus corniculatus	bird's foot trefoil	nonnative	FAC	
Lupinus arboreus	coastal bush lupine	native		
Lythrum hyssopifolia	hyssop loosestrife	nonnative		
Madia sativa	coastal tarweed	native		
Malva sp.[4]	unknown mallow	unknown		
Matricaria discoidea	pineapple weed	native	FACU	
Mercurialis annua	annual mercury	nonnative		
Muhlenbergia rigens[3]	deergrass	native	UPL	
Myoporum laetum	ngaio tree	nonnative	UPL	moderate
Nasturtium officinale	watercress	native	OBL	
Oenanthe sarmentosa	water parsley	native	OBL	
Oenothera elata ssp. hookeri	evening primrose	native	FACW	
Opuntia ficus-indica	prickly pear	nonnative		
Oxalis corniculata	creeping wood sorrel	nonnative	FACU	
Pennisetum clandestinum	kikuyu grass	nonnative		limited
Persicaria punctata	dotted smartweed	native	OBL	
Phacelia malvifolia	stinging phacelia	native		
Phacelia sp.[4]	unknown phacelia	native		
Phalaris aquatica	Harding grass	nonnative	FACU	moderate
Pinus radiata[5]	Monterey pine	native		
Pinus sp.[4]	unknown pine	unknown		
Plantago coronopus	cut leaf plantain	nonnative	FAC	
Plantago lanceolata	ribwort	nonnative	FACU	limited
Platanus racemosa	California sycamore	native	FACW	
Polygonum aviculare ssp. *depressum*	prostrate knotweed	nonnative	FAC	
Raphanus sativus	jointed charlock	nonnative		limited
Rosa sp.[3]	ornamental rose	nonnative		
Rubus armeniacus	Himalayan blackberry	nonnative	FAC	high
Rubus ursinus	California blackberry	native	FACU	
Rumex acetosella	sheep sorrel	nonnative	FACU	moderate
Rumex crispus	curly dock	nonnative	FAC	limited
Rumex transitorius	willow dock	native	FACW	
Salix laevigata	polished willow	native	FACW	
Salix lasiandra	Pacific willow	native	FACW	
Salix lasiolepis	arroyo willow	native	FACW	
Sambucus racemosa	red elderberry	native	FACU	

Scientific Name	Common Name	Native Status	WMVC Wetland Rating[1]	Cal-IPC Rating[2]
Scabiosa atropurpurea	pincushions	nonnative		watch
Scirpus microcarpus	mountain bog bulrush	native	OBL	
Scrophularia californica	California bee plant	native	FAC	
Senecio vulgaris	common groundsel	nonnative	FACU	
Solanum sp. [4]	unknown nightshade	unknown		
Sonchus asper	spiny sowthistle	nonnative	FACU	
Stachys sp.[4]	unknown hedgenettle	native		
Symphyotrichum chilense	Pacific aster	native	FAC	
Toxicodendron diversilobum	poison oak	native	FAC	
Tropaeolum majus	garden nasturtium	nonnative	UPL	
Urtica dioica	stinging nettle	native	FAC	
Vicia sativa	spring vetch	nonnative	UPL	
Viola sp.	unknown violet	unknown		
Woodwardia fimbriata	western chain fern	native	FACW	
Zantedeschia aethiopica	calla lily	nonnative	OBL	limited

Notes:

[1] WMVC wetland rankings are defined as follows: OBL (obligate), FACW (facultative wetland), FAC (facultative upland), FACU (facultative upland), UPL (upland). Plants without a wetland indicator ranking are assumed to be upland species.

[2] Cal-IPC invasive plant rankings are defined as follows: high (species with severe ecological impacts), moderate (substantial and apparent, but not severe, ecological impacts), limited (minor ecological impacts, or information on them is limited), watch (at a high risk of becoming invasive in the future).

[3] Ornamental landscape or cultivated agricultural crops

[4] Plants that could not be identified to the species level, most due to not being in flower or fruit at the time of survey

[5] Plants that are native to California but not native to San Mateo County; they are therefore considered nonnative in this report

Cal-IPC = California Invasive Plant Council
WMVC = Western Mountains, Valleys, and Coast

Appendix B . 0Q130 Vegetation Communities Map

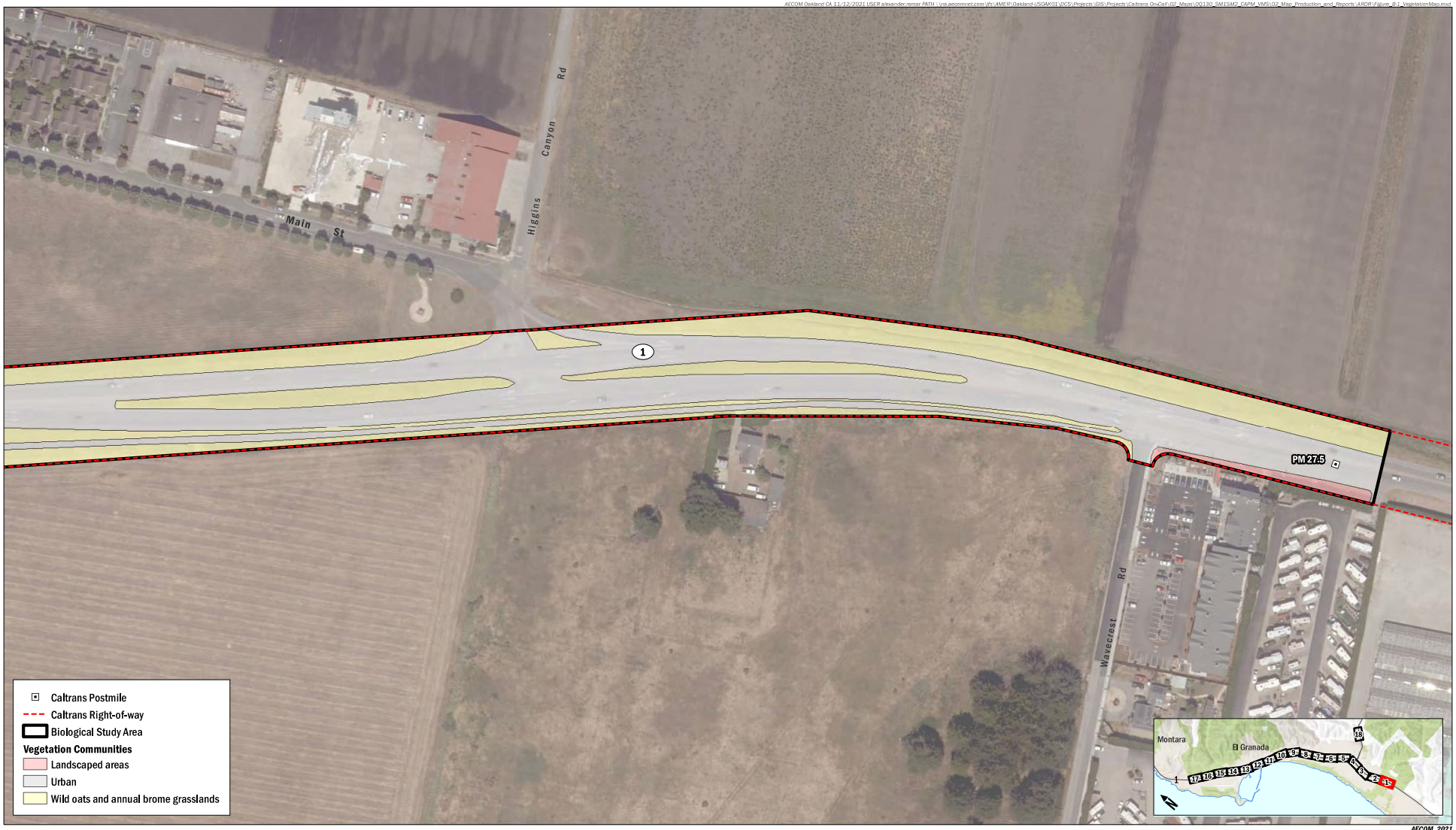

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FIGURE B-1

Vegetation Communities in the BSA

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FIGURE B-1

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FIGURE B-1

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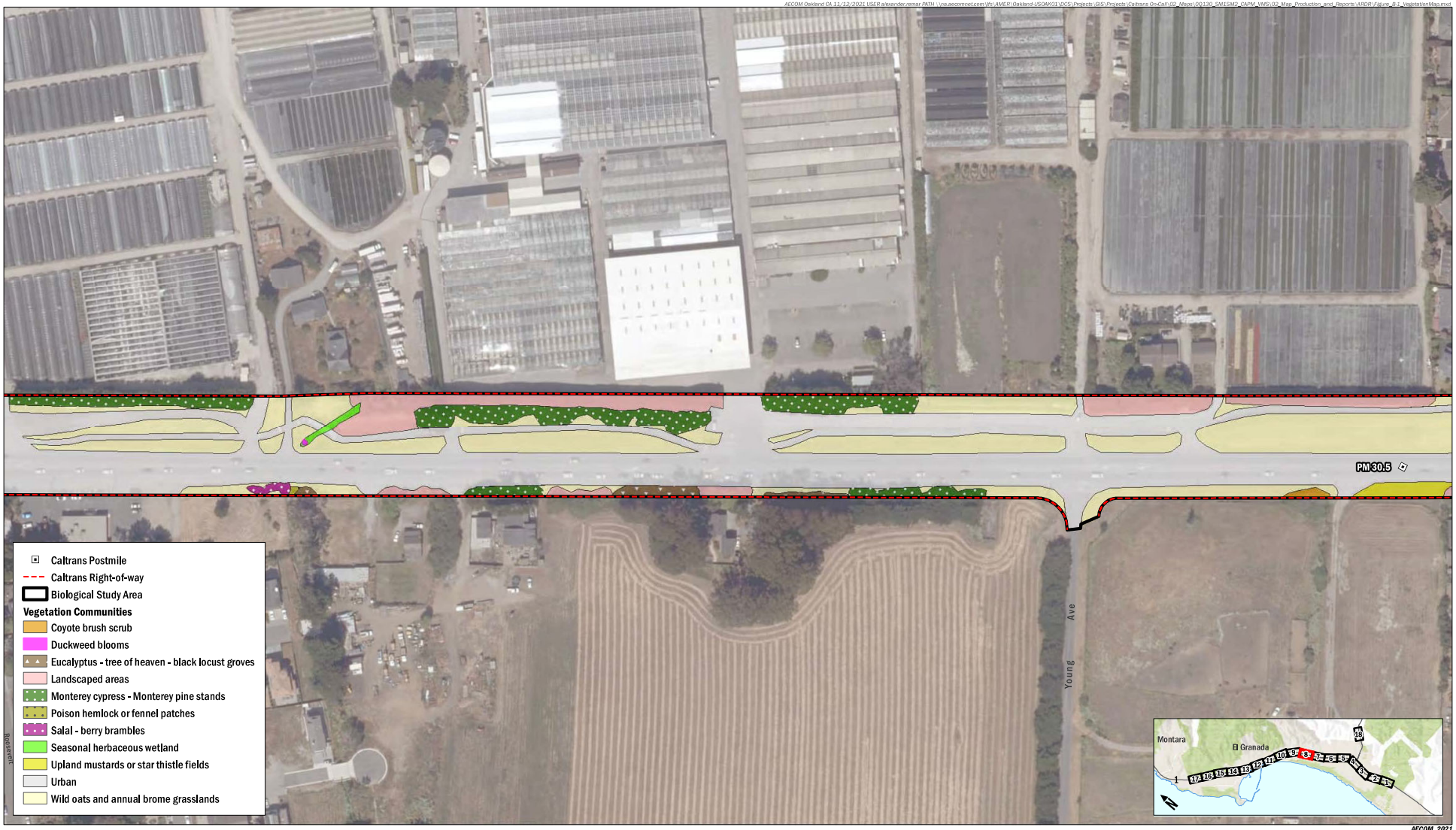

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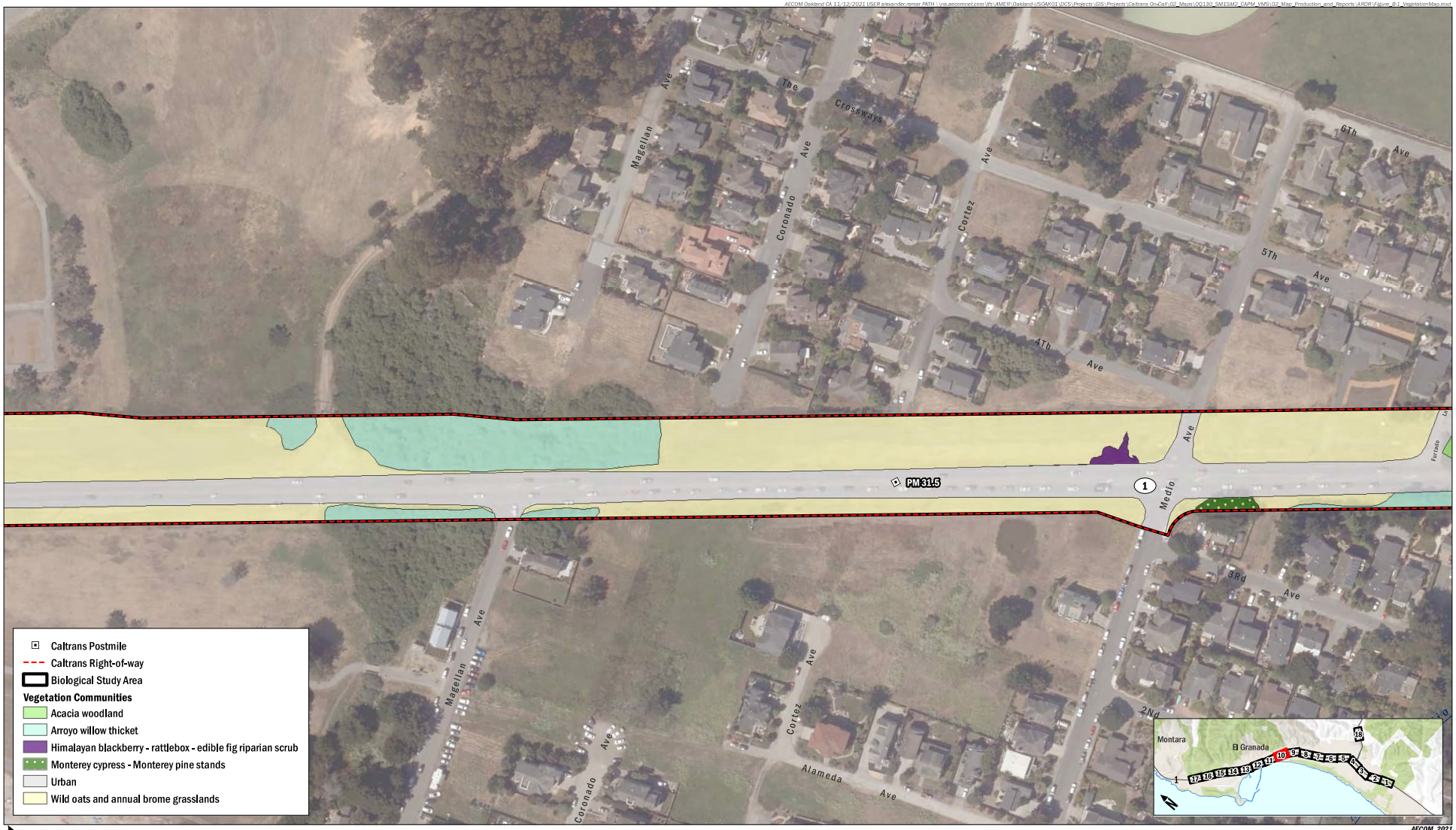

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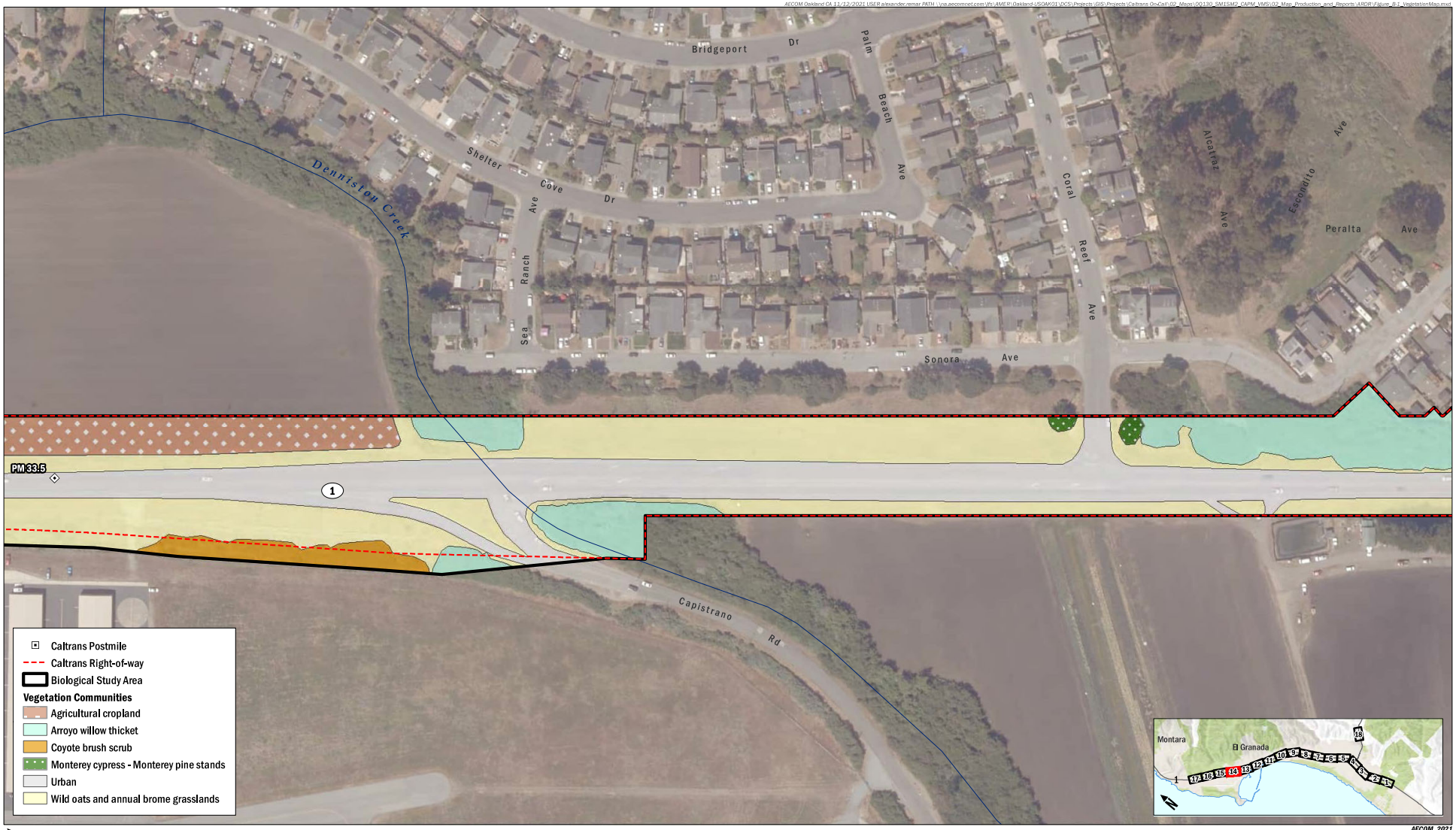

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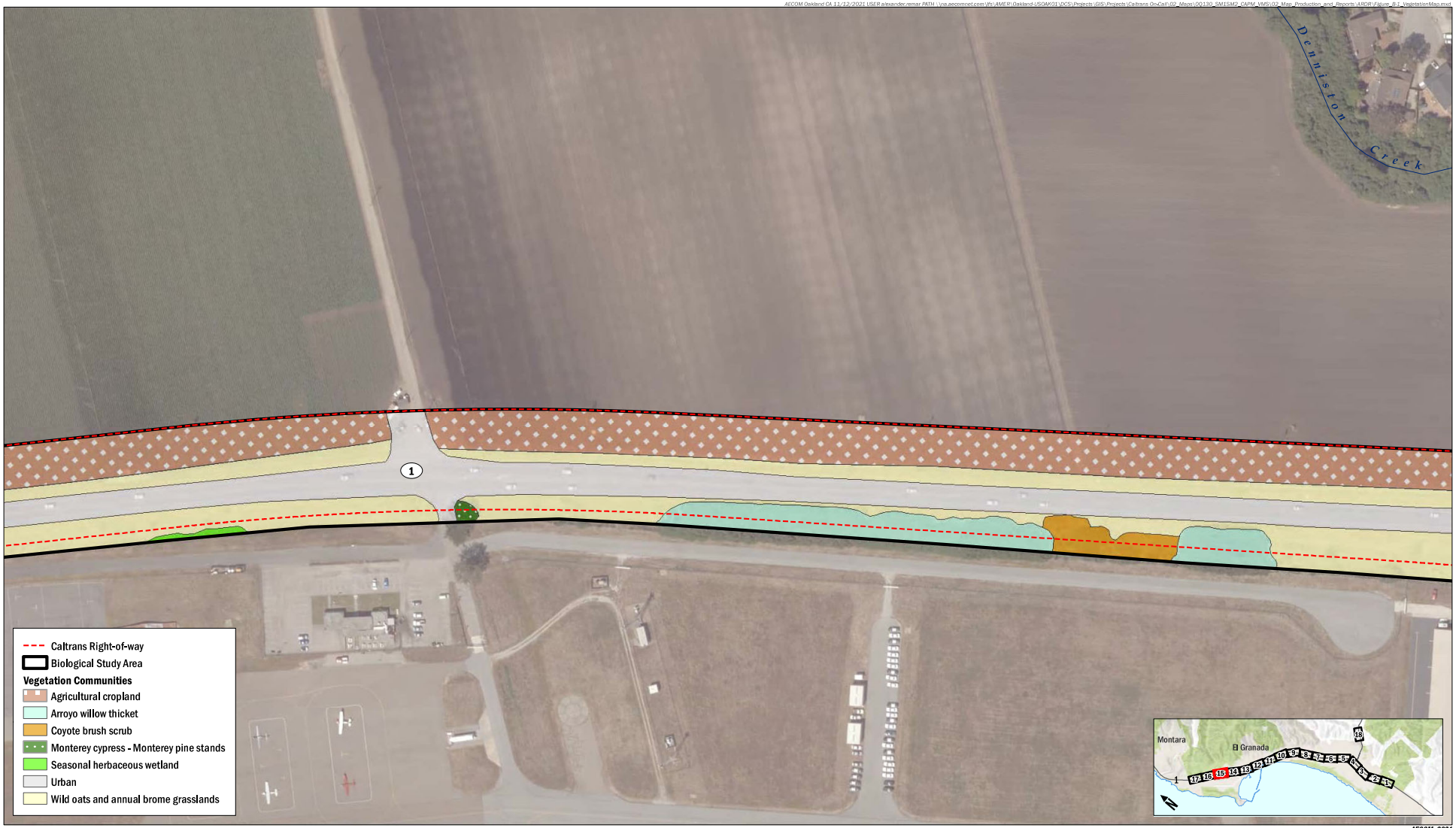

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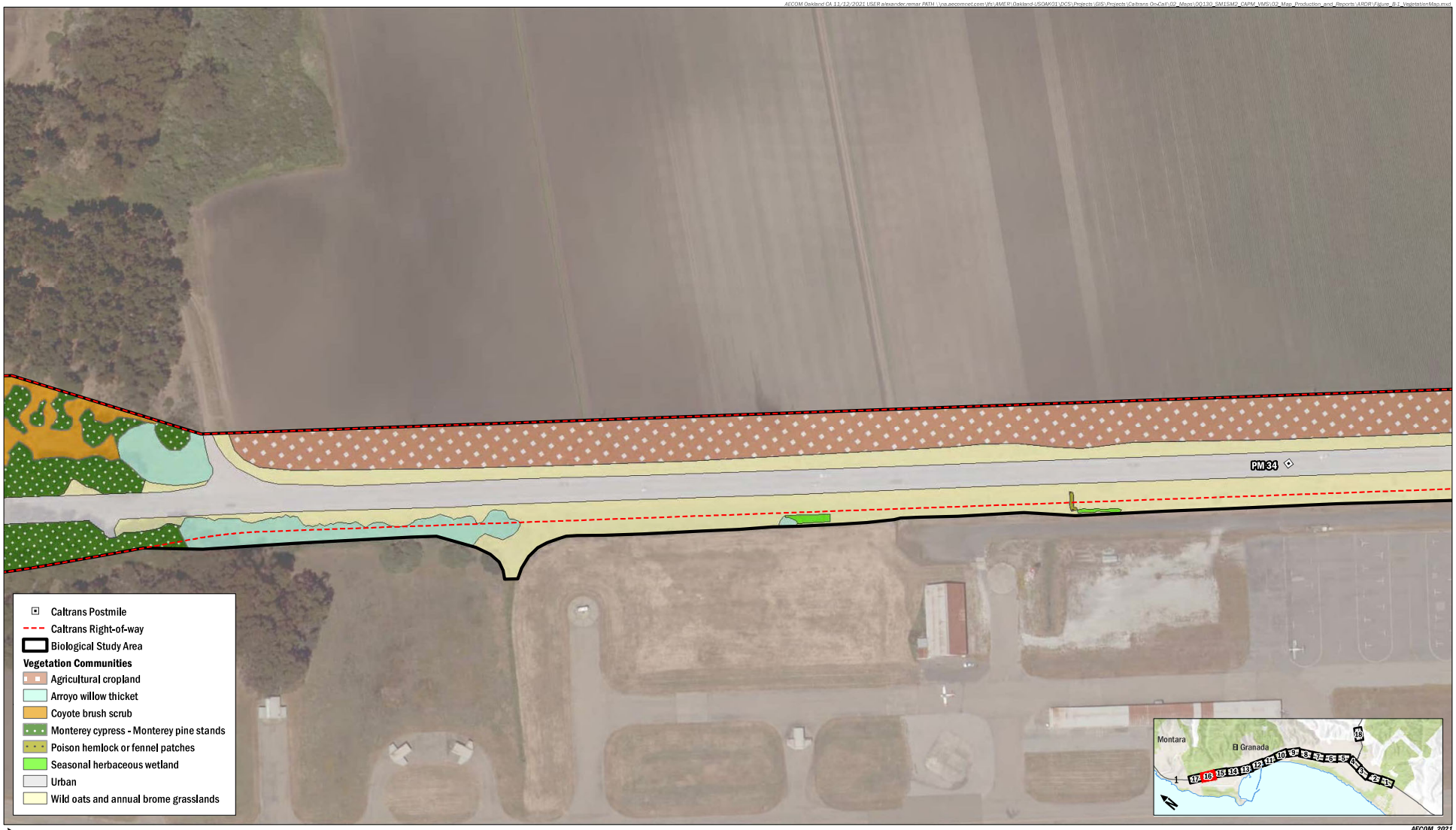

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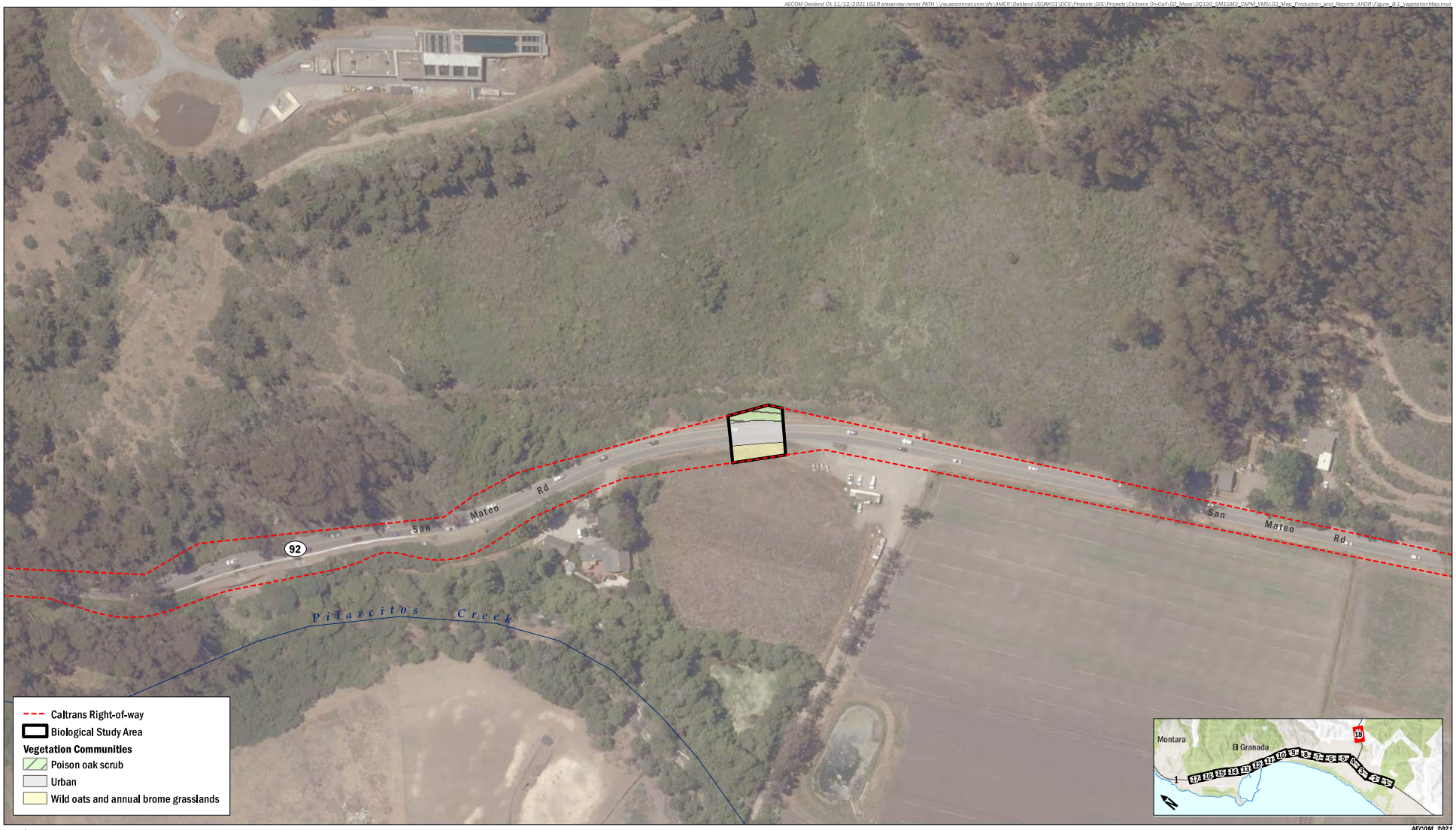

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FIGURE B-1

Vegetation Communities in the BSA

Appendix E Potential for Special-Status Plant and Animal Species to Occur in the BSA

Potential for Special-Status Plant Species to occur in the BSA

Table E-1 Special-Status Plant Species: Listed or Proposed Species Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	Scientific Name	Status	General Habitat Description/Bloom Period/Elevation Range	Habitat Present/ Absent	Potential to Occur/Rationale
San Mateo thorn-mint	*Acanthomintha duttonii*	FE/SE/CRPR List 1B.1	Serpentinite, chaparral and valley and foothill grassland. Blooms: April through June. Elevation range 50 to 300 m.	Absent	**None.** Outside the elevation range and no suitable habitat. Not observed during botanical surveys.
Blasdale's bent grass	*Agrostis blasdalei*	--/--/CRPR List 1B.2	Coastal bluff scrub, coastal dunes, coastal prairie. Blooms: May through July. Elevation range 0 to 150 m.	Absent	**None.** No suitable habitat. Not observed during botanical surveys.
Franciscan onion	*Allium peninsulare* var. *franciscanum*	--/--/CRPR List 1B.2	Clay, volcanic, often serpentinite, cismontane woodland and valley and foothill grassland. Blooms: May and June. Elevation range 52 to 3000 m.	Present	**Low.** Outside the elevation range and habitat is limited; nearest CNDDB occurrence is 7 miles away and not observed during botanical surveys.
Bent-flowered fiddleneck	*Amsinckia lunaris*	--/--/CRPR List 1B.2	Clay, volcanic, often serpentinite, cismontane woodland and valley and foothill grassland. Blooms: May through June. Elevation range 52 to 3000 m. Blooms March through June. Elevation range 3 to 500 m.	Absent	**None.** There is no suitable habitat and no CNDDB occurrences within 10 miles and not observed during botanical surveys.
Anderson's manzanita	*Arctostaphylos andersonii*	--/--/CRPR List 1B.2	Broad-leafed upland forest, chaparral, north coast coniferous forest. Blooms November through May. Elevation range 60 to 760 m.	Absent	**None.** Outside the elevation range and the nearest CNDDB occurrence is over 3 miles away. Not observed during botanical surveys.
Montara manzanita	*Arctostaphylos montaraensis*	--/--/CRPR List 1B.2	Chaparral (maritime), Coastal scrub. Blooms January through March. Elevation range 80 to 500 m.	Absent	**None.** Outside the elevation range and no suitable habitat. Not observed during botanical surveys.
Kings Mountain manzanita	*Arctostaphylos regismontana*	--/--/CRPR List 1B.2	Broad-leafed upland forest, chaparral, north coast coniferous forest. Blooms December through April. Elevation range 305 to 730 m.	Absent	**None.** Outside the elevation range and not observed during botanical surveys.
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	--/--/CRPR List 1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps (coastal salt, streamsides). Blooms (April) June through October. Elevation range 0 to 30 m.	Absent	**None.** Outside the elevation range and no coastal dunes, coastal scrub or marshes and therefore no suitable habitat. Not observed during botanical surveys.

Common Name	Scientific Name	Status	General Habitat Description/Bloom Period/Elevation Range	Habitat Present/ Absent	Potential to Occur/Rationale
Franciscan thistle	*Cirsium andrewsii*	--/--/CRPR List 1B.2	Broad-leafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Blooms: March through July. Elevation range 0 to 150 m.	Present	**Low.** Nearest CNDDB occurrence is over 7 miles away and not observed during botanical surveys.
Fountain thistle	*Cirsium fontinale* var. *fontinale*	FE/SE/CRPR List 1B.1	Serpentinite seeps, chaparral (openings), Cismontane woodland and valley and foothill grassland. Blooms: May through October. Elevation range 45 to 175 m.	Absent	**None.** Outside the elevation range and no suitable habitat; nearest CNDDB occurrence is 5 miles away. Not observed during botanical surveys.
San Francisco collinsia	*Collinsia multicolor*	--/--/CRPR List 1B.2	Sometimes serpentinite, closed-cone coniferous forest, coastal scrub. Blooms: (February) March through May. Elevation range 30 to 250 m.	Absent	**None.** Outside the elevation range and no suitable habitat; nearest CNDDB occurrence is over 4.8 miles away. Not observed during botanical surveys.
Western leatherwood	*Dirca occidentalis*	--/--/CRPR List 1B.2	Broad-leafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, riparian forest, riparian woodland. Blooms January through March. Elevation ranges 50 to 400 m.	Present	**Low.** Nearest CNDDB occurrence is less than a mile away. Habitat is present but none were observed during botanical surveys.
San Mateo woolly sunflower	*Eriophyllum latilobum*	FE/SE/CRPR List 1B.1	Cismontane woodland (often serpentinite, on roadcuts). Blooms: May and June. Elevation range 45 to 150 m.	Absent	**None.** Outside the elevation range and no suitable habitat; nearest CNDDB occurrence is 5 miles away and not observed during botanical surveys.
Hillsborough chocolate lily	*Fritillaria biflora* var. *ineziana*	--/--/CRPR List 1B.1	Cismontane woodland, valley and foothill grassland. Blooms: March and April. Elevation range 150 to 150 m.	Absent	**None.** Outside the elevation range and nearest CNDDB occurrence is over 3 miles away.
Fragrant fritillary	*Fritillaria liliacea*	--/--/CRPR List 1B.2	Often serpentinite, Cismontane woodland, coastal prairie, coastal scrub, and valley and foothill grassland. Blooms: February through April. Elevation range 3 to 410 m.	Absent	**None.** Nearest CNDDB occurrence is over 4 miles away and habitat is not suitable nor observed during botanical surveys.
Short-leaved evax	*Hesperevax sparsiflora* var. *brevifolia*	--/--/CRPR List 1B.2	Coastal bluff scrub (sandy), coastal dunes and coastal prairie. Blooms: March through June. Elevation range 0 to 215 m.	Absent	**None.** Outside the elevation range and habitat is not suitable; not observed during botanical surveys.
Marin western flax	*Hesperolinon congestum*	FT/ST/CRPR List 1B.1	Serpentinite, chaparral and valley and foothill grassland. Blooms: April through July. Elevation range 5 to 370 m.	Absent	**None.** No suitable habitat at either site, the nearest CNDDB occurrence is over 5 miles away and none were observed during botanical surveys.

Common Name	Scientific Name	Status	General Habitat Description/Bloom Period/Elevation Range	Habitat Present/ Absent	Potential to Occur/Rationale
Kellogg's horkelia	*Horkelia cuneata* var. *sericea*	--/--/CRPR List 1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub. Blooms: April through September. Elevation range 10 to 200 m.	Absent	**None.** No suitable habitat and none were observed during botanical surveys.
Point Reyes horkelia	*Horkelia marinensis*	--/--/CRPR List 1B.2	Coastal dunes, coastal prairie, and coastal scrub. Blooms: May through September. Elevation range 5 to 755 m.	Absent	**None.** No suitable habitat and none were observed during botanical surveys.
Island tube lichen	*Hypogymnia schizidiata*	--/--/CRPR List 1B.3	Closed-cone coniferous forest, chaparral. No blooming period. Elevation range 360 to 755 m.	Absent	**None.** Outside the elevation range and no suitable habitat. None were observed during botanical surveys.
Perennial goldfields	*Lasthenia californica* ssp. *macrantha*	--/--/CRPR List 1B.2	Coastal bluff scrub, coastal dunes and coastal scrub. Blooms: January through November. Elevation range 5 to 520 m.	Absent	**None.** No suitable habitat and none were observed during botanical surveys.
Coast yellow leptosiphon	*Leptosiphon croceus*	--/CC/CRPR List 1B.1	Coastal bluff scrub and coastal prairie. Blooms: April through June. Elevation range 10 to 150 m.	Absent	**None.** Outside the elevation range and no suitable habitat. None were observed during botanical surveys.
Crystal Springs lessingia	*Lessingia arachnoidea*	--/--/CRPR List 1B.2	Cismontane woodland, coastal scrub and valley and foothill grassland. Blooms: July through October. Elevation range 60 to 200 m.	Absent	**None.** Outside the elevation range; no CNDDB occurrences within 10 miles. None were observed during botanical surveys.
Ornduff's meadowfoam	*Limnanthes douglasii* ssp. *ornduffii*	--/--/CRPR List 1B.1	Meadows and seeps. Blooms: November through May. Elevation range 10 to 20 m.	Present	**High.** Suitable habitat and known occurrences in northern section of the alignment. These occurrences represent a portion of the only known population of this species.
Arcuate bush-mallow	*Malacothamnus arcuatus*	--/--/CRPR List 1B.2	Chaparral and Cismontane woodland. Blooms: April through September. Elevation range 15 to 355 m.	Absent	**None.** No suitable habitat and none were observed during botanical surveys.
Woodland woolythreads	*Monolopia gracilens*	--/--/CRPR List 1B.2	Serpentine, broad leafed upland forest (openings), chaparral (openings), Cismontane woodland, North Coast coniferous forest (openings), and valley and foothill grassland. Blooms: February through July. Elevation range 100 to 1,200 m.	Absent	**None.** Outside the elevation range and none were observed during botanical surveys.
White-rayed pentachaeta	*Pentachaeta bellidiflora*	FE/SE/CRPR List 1B.1	Cismontane woodland, Valley and foothill grassland (often serpentinite). Blooms: March through May. Elevation range 35 to 620 m.	Absent	**None.** No suitable habitat; nearest CNDDB occurrence is over 5 miles away. None were observed during botanical surveys

Common Name	Scientific Name	Status	General Habitat Description/Bloom Period/Elevation Range	Habitat Present/ Absent	Potential to Occur/Rationale
Choris' popcornflower	*Plagiobothrys chorisianus* var. *chorisianus*	--/--/CRPR List 1B.2	Chaparral, coastal prairie, coastal scrub. Blooms: March through June. Elevation range 3 to 160 m.	Present	**Low.** The nearest CNDDB occurrence to the Pilarcitos Creek is 0.5 mile away. The habitat at Pilarcitos Creek is marginal for this species, however none were observed during botanical surveys.
Oregon polemonium	*Polemonium carneum*	--/--/CRPR List 2B.2	Coastal prairie, coastal scrub and lower montane coniferous forest. Blooms: April through September. Elevation range 0 to 1,830 m.	Absent	**None.** There are no nearby CNDDB occurrences within 10 miles of the project site.
Hickman's cinquefoil	*Potentilla hickmanii*	FE/SE/CRPR List 1B.1	Coastal bluff scrub, closed-cone coniferous forest, meadows and seeps (vernally mesic), marshes and swamps (freshwater). Blooms: April through August. Elevation range 10 to 149 m.	Absent	**None.** Outside the elevation range; nearest CNDDB occurrence is over 5 miles away. The habitat at Pilarcitos Creek seems to be unsuitable for this species. None were observed during botanical surveys.
Chaparral ragwort	*Senecio aphanactis*	--/--/CRPR List 2B.2	Chaparral, cismontane woodland and coastal scrub. Blooms: January through April (May). Elevation range 15 to 800 m.	Absent	**None.** No suitable habitat; nearest CNDDB occurrence is over 5 miles away. None were observed during botanical surveys.
Scouler's catchfly	*Silene scouleri* ssp. *scouleri*	--/--/CRPR List 2B.2	Coastal bluff scrub, Coastal prairie and valley and foothill grassland. Blooms: (March through May)June through August (September). Elevation range 0 to 600 m.	Absent	**None.** No suitable habitat; nearest CNDDB occurrence is over 5 miles away. None were observed during botanical surveys.
San Francisco campion	*Silene verecunda* ssp. *verecunda*	--/--/CRPR List 1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Blooms: (February) March through June (August). Elevation range 30 to 645 m.	Absent	**None.** The nearest CNDDB occurrence to the Pilarcitos Creek is 4 miles away. The habitat at either site does not seem suitable for the species. None were observed during botanical surveys.
San Francisco owl's-clover	*Triphysaria floribunda*	--/--/CRPR List 1B.2	Coastal prairie, coastal scrub, valley and foothill grassland. Blooms: April through June. Elevation range 10 to 160 m.	Present	**Low.** The nearest CNDDB occurrence to the Pilarcitos Creek is 4.6 miles away. The habitat at Pilarcitos Creek does not seem suitable for the species. None were observed during botanical surveys.
Coastal triquetrella	*Triquetrella californica*	--/--/CRPR List 1B.2	Coastal bluff scrub and coastal scrub. No bloom period. Elevation range 10 to 100 m.	Absent	**None.** Outside the elevation range; nearest CNDDB occurrence is over 9 miles away. The habitat does not appear to be suitable for this species and none were observed during botanical surveys.

Notes:

CNDDB = California Natural Diversity Database
CRPR = California Rare Plant Rank:
List 1B.1 = Rare throughout range; more than 80 percent of occurrences threatened
List 1B.2 = Rare throughout range; 20 to 80 percent of occurrences threatened
2A = Plants presumed extirpated in California, but common elsewhere
2B = Plants rare, threatened, or endangered in California, but more common elsewhere.
FE = federal endangered
FT = federally threatened
m = meters
SE = state endangered
ST = state threatened

Table E-2 Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Biological Study Area

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Potential to Occur/Rationale
Birds					
Long-eared owl	*Asio otus*	--/SSC	They build stick nests in trees or cliffs, in abandoned squirrel nests or on the ground and forage in grasslands, shrublands, coniferous forests or deciduous forests.	Present	**Low.** The nearest CNDDB occurrence is over 10 miles. Despite the low numbers of occurrences, the trees and forest habitat in the project footprints could be potentially suitable habitat for them to build their stick nests.
Burrowing owl	*Athene cunicularia*	-- /SSC	Inhabits open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Typically nests in mammal burrows.	Absent	**None.** Not suitable habitat for this species.
Marbled murrelet	*Brachyramphus marmoratus*	FT/SE	[Nesting Trees] Nests inland from coast in old-growth redwood dominated forests.	Absent	**None.** No suitable nesting habitat. Surveys indicate that suitable old growth redwood trees, or large redwood trees with suitable platforms for nesting are not present.
Western snowy plover	*Charadrius nivosus*	FT/SSC	Nests on sandy beaches, salt pond levees, and shores of large alkali lakes.	Absent	**None.** None of these nesting habitats are present in the BSA.
Black swift	*Cypseloides niger*	--/SSC	Requires specialized forested areas near rivers where nests are behind waterfalls or damp cliffs.	Absent	**None.** No suitable waterfalls or damp cliffs occur in the BSA for suitable nesting habitat.
American peregrine falcon	*Falco peregrinus anatum*	FD/SD, FP	[Nesting Habitat] Open country including tundra, coastal, mountainous, and forested regions; nests on rocky cliff ledges, large trees or tall urban structures near water	Absent	**Low.** There are no cliff ledges or tall urban structures. There are large alder trees at Pilarcitos Creek near the coastline and some open habitat areas nearby which are marginally suitable for this species.
Saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	--/SSC	Resident of San Francisco Bay region in fresh and saltwater marshes and riparian areas.	Absent	**None.** There are no saltmarshes or riparian areas near San Francisco Bay in BSA.
Bald eagle	*Haliaeetus leucocephalus*	FD/SE, FP	Nests primarily in large trees, usually within 1 mile of water; forages along ocean shore, lake margins, and large rivers.	Present	**Low.** The closest CNDDB occurrence is from 6 miles away. Pilarcitos Creek is nearby the Pacific Ocean shoreline. However due to lack of large trees with stick nests, it is unlikely that this species would nest here.
California black rail	*Laterallus jamaicensis coturniculus*	--/ST, FP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays.	Absent	**None.** There are no freshwater or saltwater marshes, meadows or shallow margins.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Potential to Occur/Rationale
Alameda song sparrow	*Melospiza melodia pusillula*	--/SSC	Resident of the borders between saltmarsh and upland habitats within the south arm of San Francisco Bay.	Absent	**None.** BSA is near San Francisco Bay or near saltmarsh habitats. The habitat is not suitable for this species.
California Ridgway's rail	*Rallus obsoletus*	FE/SE, FP	Saltwater and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay.	Absent	**None. P**roject sites are not near San Francisco Bay or near saltmarsh habitats. The habitat is not suitable for this species in BSA.
Bank swallow	*Riparia riparia*	--/ST	[Nesting] Bank Swallows nest in fresh banks or earthen walls, and on occasion buildings, and forage insects over fields, streams, wetlands, farmlands, and still water.	Absent	**None.** There are no fresh banks of earthen walls or buildings for this species to nest in BSA. The nearest CNDDB occurrence is over 6 miles away.
California least tern	*Sterna antillarum browni*	FE/SE, FP	Nests along the coast on open beaches from San Francisco Bay south to northern Baja California. Forages in coastal and estuarine waters	Absent	**None.** There are no beaches in BSA for this species to nest.
Short-tailed albatross	*Phoebastria albatrus*	FE/SSC	Nests off islands in Japan and spend most of their lives at sea.	Absent	**None.** The BSA is not close to areas where this species nests.
Mammals					
Pallid bat	*Antrozous pallidus*	--/SSC	Found in low elevations in California, foraging in grasslands, scrub, open woodlands, and forests. Roosts in caves, crevices, mines, and hollow trees.	Present	**Low**. The BSA provides marginal potential foraging and roosting habitat in trees and forests. However, the nearest CNDDB occurrences is over 4 miles away.
Townsend's big-eared bat	*Corynorhinus townsendii*	--/SSC	Throughout California in a wide variety of habitats, but almost always near caves or abandoned mines, and other roosting areas (sometimes in abandoned buildings or large tree cavities). They can be found in pine forests and arid desert scrub habitats. Most common in mesic sites.	Absent	**None.** No caves or abandoned mines have been found in the BSA and there are no abandoned buildings. Unlikely for them to use any tree cavities.
Southern sea otter	*Enhydra lutris nereis*	FT/FP	In marine environments along the California coast from Half Moon Bay to Santa Barbara.	Absent	**None.** There are no marine environments in the BSA.
Hoary bat	*Lasiurus cinereus*	--/--	Prefers open habitats or habitat mosaics, with access to trees for roosting and open areas or habitat edges for feeding	Absent	**Low.** The trees in the BSA are in forested areas lacking open areas that are not preferred by this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Potential to Occur/Rationale
San Francisco dusky-footed woodrat	*Neotoma fuscipes annectens*	--/SSC	Occupies forested habitats of moderate canopy and moderate to dense understory. May prefer chaparral and redwood habitats.	Present	**Low.** The riparian woodland and forested habitats in the BSA provides potential habitat for this species. However, no stick nests were observed in the BSA during project field surveys.
Big free-tailed bat	*Nyctinomops macrotis*	--/SSC	Breeds in Mexico, Texas, New Mexico and southern Arizona. Prefers rugged, rocky terrain. Roosts in buildings, caves and occasionally in holes in trees.	Absent	**None.** There is no suitable habitat for this species in BSA.
Salt-marsh harvest mouse	*Reithrodontomys raviventris*	FE/SE, FP	Occurs only in saline emergent wetlands and tributaries of San Francisco Bay. Associated with stands of pickleweed (Salicornia).	Absent	**None.** There is no suitable habitat for this species in BSA.
American badger	*Taxidea taxus*	--/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Absent	**Low.** This species prefers open habitats whereas the habitats in the BSA are dense with vegetation and in moister areas.
Reptiles					
Green sea turtle	*Chelonia mydas*	FT/--	Shallow tropical and subtropical waters and coastlines.	Absent	**None.** There is no suitable marine aquatic habitat or beaches for this species in BSA.
Western pond turtle	*Emys marmorata*	--/SSC	Northern California and Oregon. Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation. Nests in nearby uplands.	Present	**Low.** Aquatic habitat in creeks is potentially suitable for this species, however, will not be adversely affected by this project.
San Francisco garter snake	*Thamnophis sirtalis tetrataenia*	FE/SE, FP	Heavily vegetated freshwater wetlands and ponds with available basking habitat. Known range limited to San Mateo and Santa Cruz counties. Feeds on amphibians such as California red-legged frog.	Present	**Moderate.** The riparian area at Pilarcitos Creek is heavily disturbed and frequented by human activity. The freshwater creeks and riparian zones may provide potential dispersal habitat.
Amphibians					
California tiger salamander	*Ambystoma californiense*	FT/ST	Occupies underground mammal burrows in grasslands and woodlands and migrates to freshwater ponds and vernal pools to reproduce.	Absent	**None.** There are no grassland or woodland areas with mammal burrows that would provide suitable upland habitat nor are there suitable freshwater ponds or vernal pools for breeding habitat for this species at BSA. The nearest CNDDB occurrence is over 8 miles away.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Potential to Occur/Rationale
Santa Cruz black salamander	*Aneides niger*	--/SSC	Occurs in mixed deciduous woodland, coniferous forests, coastal grasslands. Found under rocks near streams, in talus, under damp logs, and other objects (CalHerps 2019).	Absent	**None.** The project is located outside of the known range of the species, and suitable habitat is not present.
California giant salamander	*Dicamptodon ensatus*	--/SSC	Occurs in wet coastal forests in or near clear, cold permanent and semi-permanent streams and seepages.	Absent	**None.** Habitat for adults and sub-adults is not present in the BSA in the form of cold permanent, semi-permanent stream and coastal forest habitats.
Foothill yellow-legged frog	*Rana boylii*	--/SE, SSC	Partly shaded, shallow streams & riffles with a rocky substrate in a variety of habitats.	Absent	**None.** The creeks in the BSA lack rocky substrate to be suitable for this species.
California red-legged frog	*Rana draytonii*	FT/SSC	Dense, emergent, and riparian vegetation associated with deep (0.7 m), still or slow-moving water.	Present	**High.** Habitat for adults and sub-adults are present in the creeks, pools and riparian vegetation and variety of habitats present at each BSA. Multiple CNDDB occurrences within 1 mile of Pilarcitos Creek Bridge.
Red-bellied newt	*Taricha rivularis*	--/SSC	Rapid flowing streams with rocky substrate in proximity to redwood forests. Known range from Humboldt County to Sonoma County along the coast with potential isolated population in Stevens Creek watershed in Santa Clara County.	Absent	**None. o**utside the known range for this species**.**
Fishes					
Tidewater goby	*Eucyclogobius newberryi*	FE/SSC	Inhabits estuaries of the Pacific Coast in areas of aquatic vegetation.	Absent	**None.** There are no estuaries in the BSA or suitable habitat for this species.
Delta Smelt	*Hypomesus transpacificus*	FT/SE	Sacramento/San Joaquin Delta, seasonally in Suisun Bay, Carquinez Strait, and San Pablo Bay.	Absent	**None.** No suitable habitat in the BSA and outside the known range of this species.
Coho salmon – Central California Coast ESU	*Oncorhynchus kisutch pop. 4*	FE/SE	Unimpeded, anadromous coastal watercourses, from Punta Gorda to San Francisco Bay, including the bay.	Absent	**None. T**his species is not expected to occur in any of the watersheds within the BSA.
Steelhead – Central California Coast DPS	*Oncorhynchus mykiss irideus pop. 8*	FT/--	Unimpeded, anadromous coastal watercourses, from Russian River, south to Soquel to, but not including, Pajaro River. Also San Francisco & San Pablo Bay basins.	Present	**High.** This species is known to occur in portions of the Pilarcitos Creek watershed, and is likely to occur is Frenchman's and Denniston Creeks.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Potential to Occur/Rationale
Steelhead – Central California Coast DPS designated critical habitat			Critical Habitat for this species was designated in 2005. Includes many streams in San Mateo County.	Present	**High.** Designated Critical habitat is present at Pilarcitos, Frenchman's, and Denniston Creek.
Longfin smelt	*Spirinchus thaleichthys*	FC/ST	Euryhaline, nektonic & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater	Absent	**None.** No suitable habitat for this species in the BSA and outside its known range.
Invertebrates					
obscure bumble bee	*Bombus caliginosus*	--/--/--	Grassy coastal prairies and coast range meadows along the Pacific Coast, from southern California to southern British Columbia.	Absent	**Low.** There is not suitable habitat in the BSA for this species.
Crotch bumble bee	*Bombus crotchii*	--/SC	Inhabits open grassland and scrub habitats and nesting occurs underground. Occurs from northern California to Mexico border.	Absent	**Low.** There is not suitable open habitat in the BSA for this species.
Western bumble bee	*Bombus occidentalis*	--/SC	Inhabits open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Typically nests in underground burrows or other cavities.	Absent	**Low.** There is not suitable open habitats in the BSA for this species.
San Bruno Elfin Butterfly	*Callophrys mossii bayensis*	FE/--	Inhabits rocky outcrops and cliffs in coastal scrub on the San Francisco Peninsula, endemic to this habitat in California.	Absent	**None.** There are no rocky outcrops and cliffs in coastal scrub in the BSA; outside the known range of this species.
Bay checkerspot butterfly	*Euphydryas editha bayensis*	FT/--	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco bay.	Absent	**None.** There are no serpentine grasslands or any of the host plants for this species in the BSA. The BSA is outside the known range of this species.
Edgewood Park micro-blind harvestman	*Microcina edgewoodensis*	--/--	Serpentine rocks in grassland adjacent to scrub oaks.	Absent	**None.** There are no serpentine grasslands or any of the host plants for this species in the BSA; outside the known range of this species.
Mission blue butterfly	*Plebejus icarioides missionensis*	FE/--	Coastal chaparral and grasslands where host plants (lupine spp.) and nectar plants occur.	Absent	**None.** There are no chaparral or grassland habitats or any of the host plants for this species in the BSA; outside the known range of this species.

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/Absent	Potential to Occur/Rationale
Myrtle's silverspot butterfly	*Speyeria zerene myrtleae*	FE/--	Coastal sand dunes or prairie habitat within 3 miles of the coast that are sheltered by wind. Range is from San Mateo County to mouth of Russian River.	Absent	**None.** There are no coastal sand dunes or prairie habitat that is suitable for this species in the BSA.

Notes:

BSA = biological study area
CNDDB = California Natural Diversity Database
DPS = distinct population segment
ESU = evolutionarily significant unit
FC = federal candidate
FE = federal endangered
FP = fully protected
FT = federally threatened
SC = state candidate
SE = state endangered
SSC = state species of special concern
ST = state threatened

Appendix F Map of Project Impacts to Wetlands, Waters, and Potential Habitat for Special-Status Species

AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM
Caltrans District 4

State Route 1 Multi-Asset Roadway Rehabilitation Project
San Mateo County, CA
PM 27.5/34.8
EA 04-0Q130 / Project ID 0418000053

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Caltrans, 2021
San Mateo County Imagery, 2018

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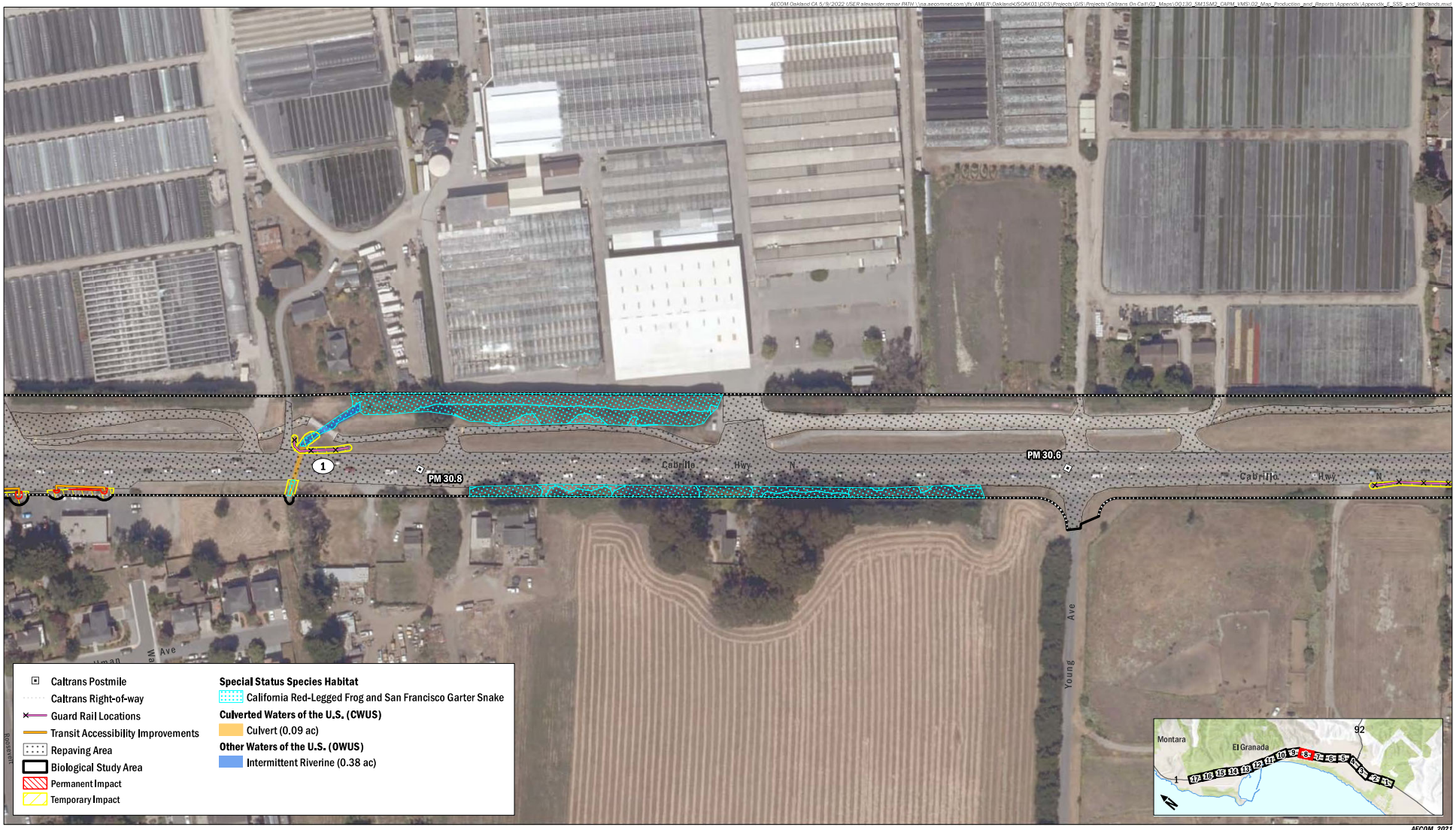
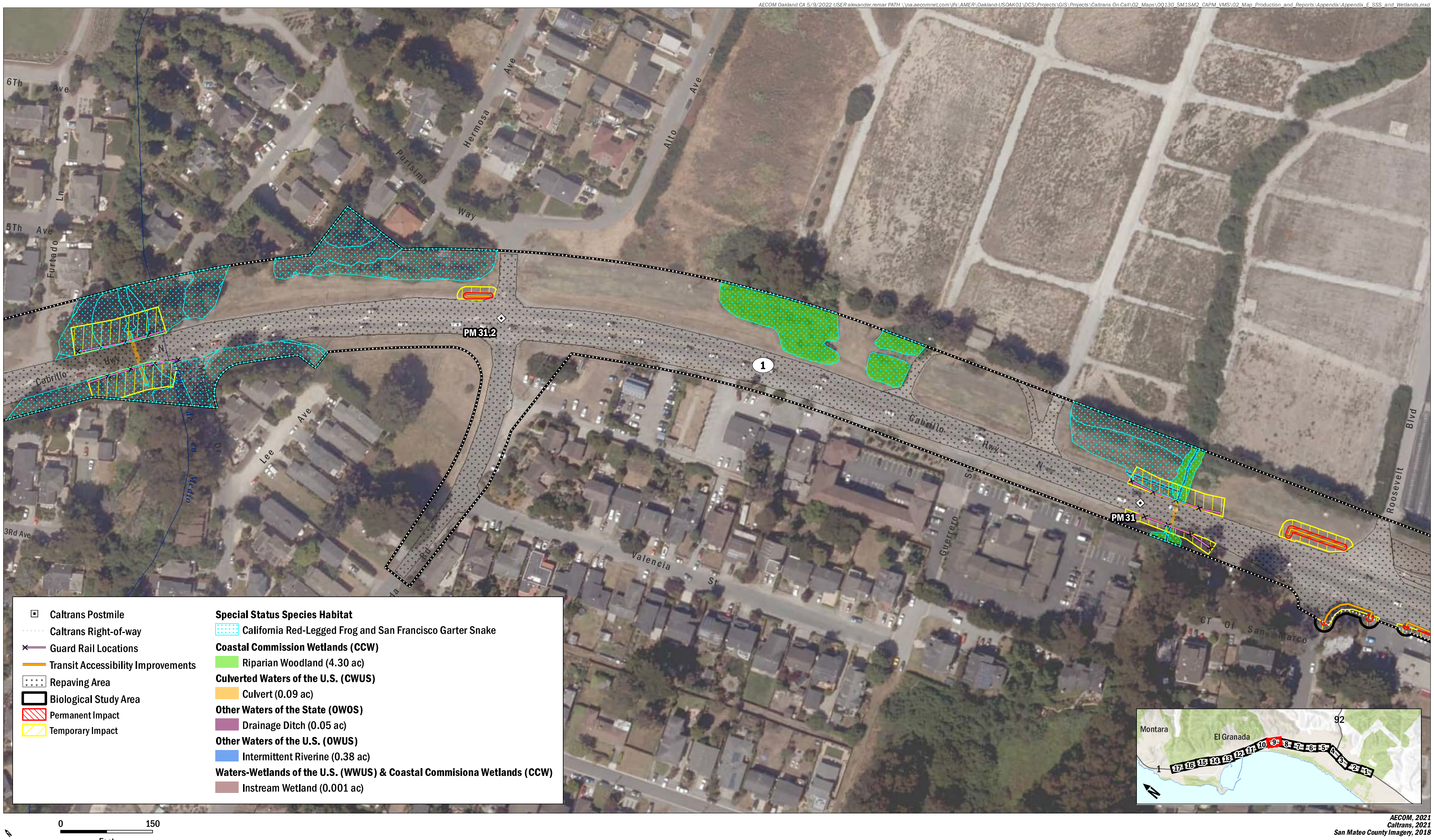


AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018



AECOM
Caltrans District 4
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PM 31.6
PM 31.4
Cabrillo Hwy N
1
Magellan Ave
The Crossways
Coronado Ave
Cortez Ave
Medio Ave
Granada
5Th Ave
6Th Ave
4Th Ave
3Rd Ave
2Nd Ave
Alameda Ave
Caltrans Postmile
Caltrans Right-of-way
Guard Rail Locations
Transit Accessibility Improvements
Repaving Area
Biological Study Area
Permanent Impact
Temporary Impact
Special Status Species Habitat
California Red-Legged Frog and San Francisco Garter Snake
Coastal Commission Wetlands (CCW)
Riparian Woodland (4.30 ac)
Culverted Waters of the State (CWOS)
Culvert (0.05 ac)
Other Waters of the State (OWOS)
Drainage Ditch (0.05 ac)
Montara
El Granada
92
0
150
Feet
AECOM, 2021
Caltrans, 2021
San Mateo County Imagery, 2018

AECOM
Caltrans District 4

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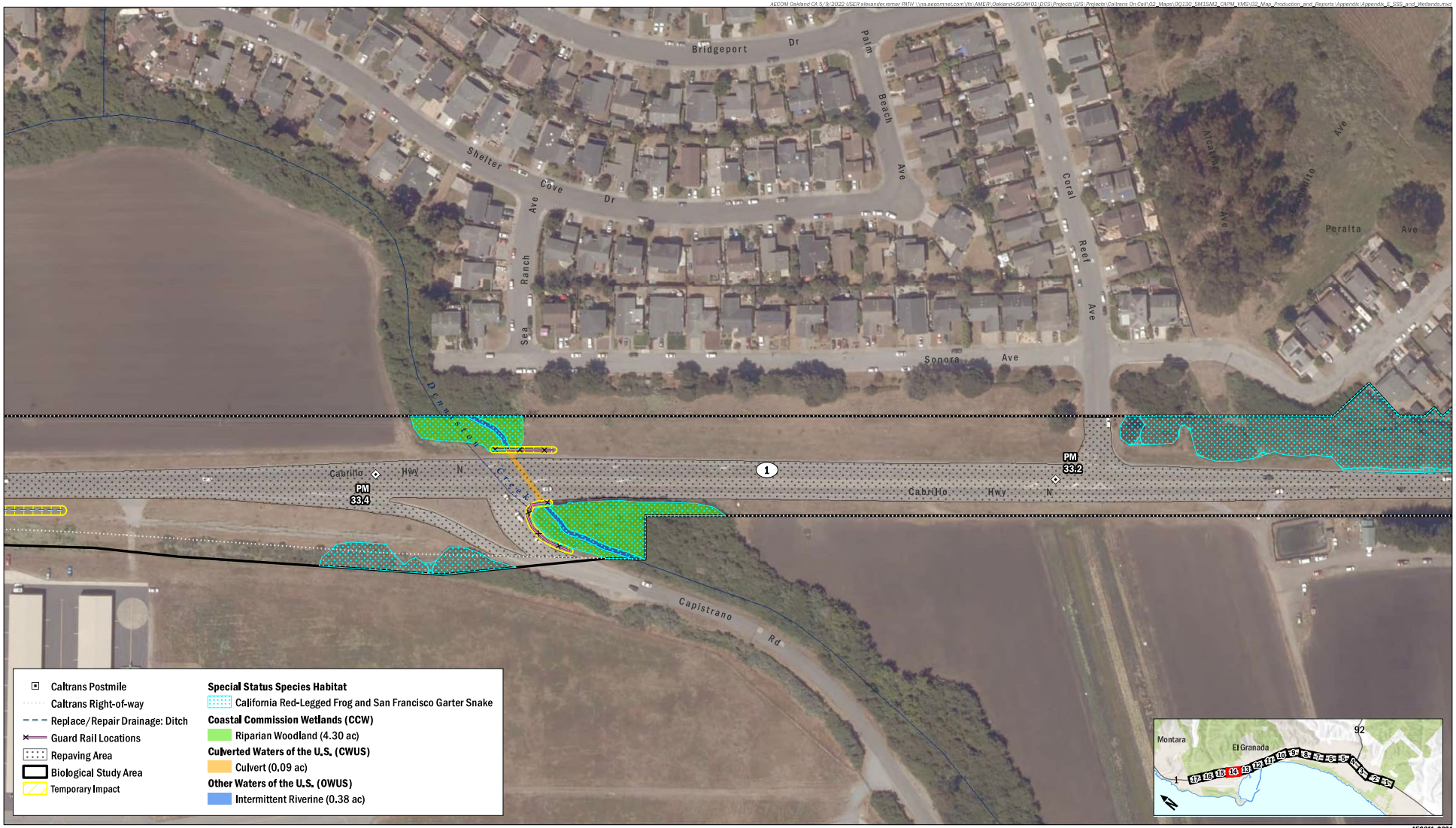

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Caltrans, 2021
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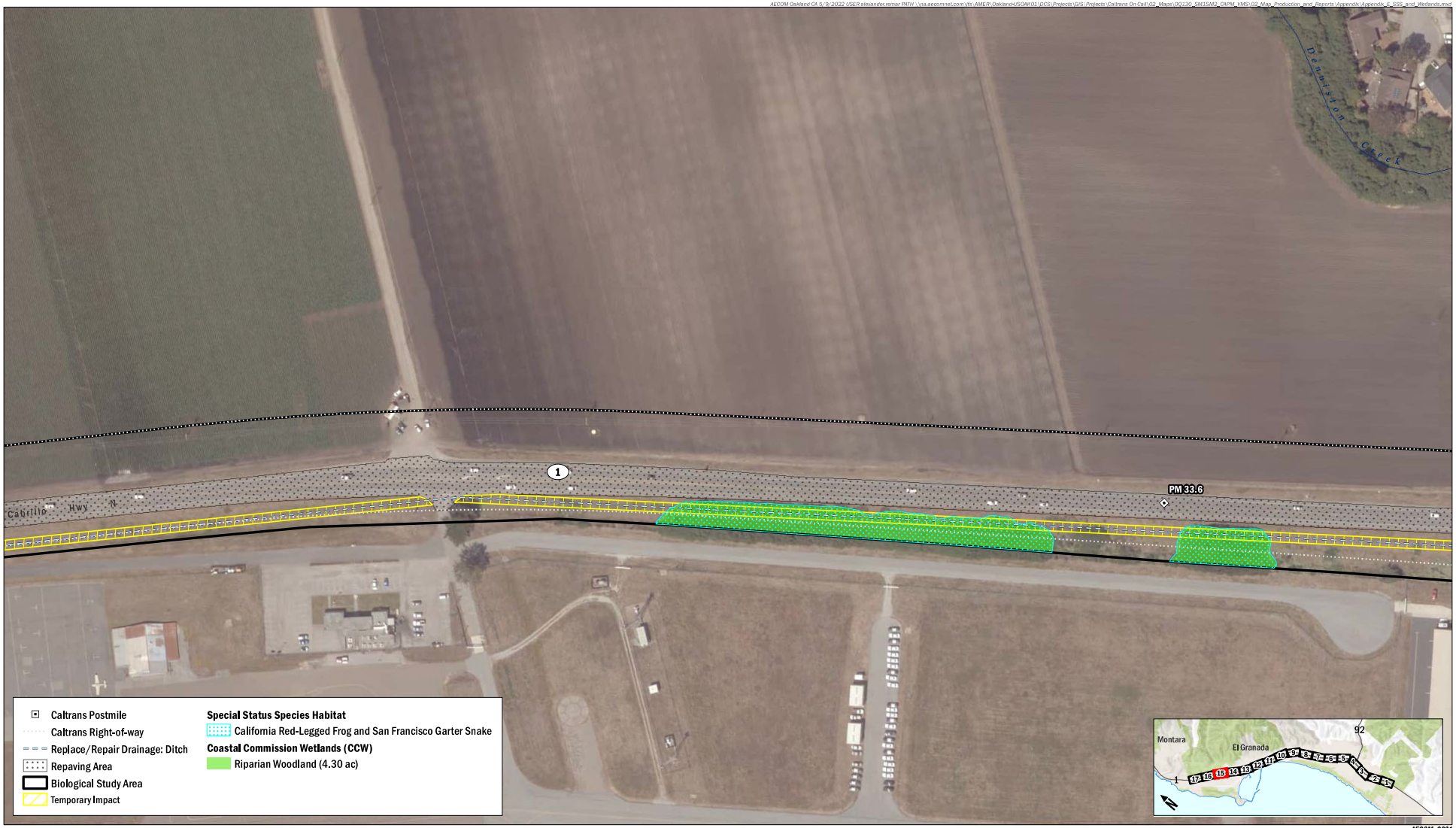

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Caltrans District 4

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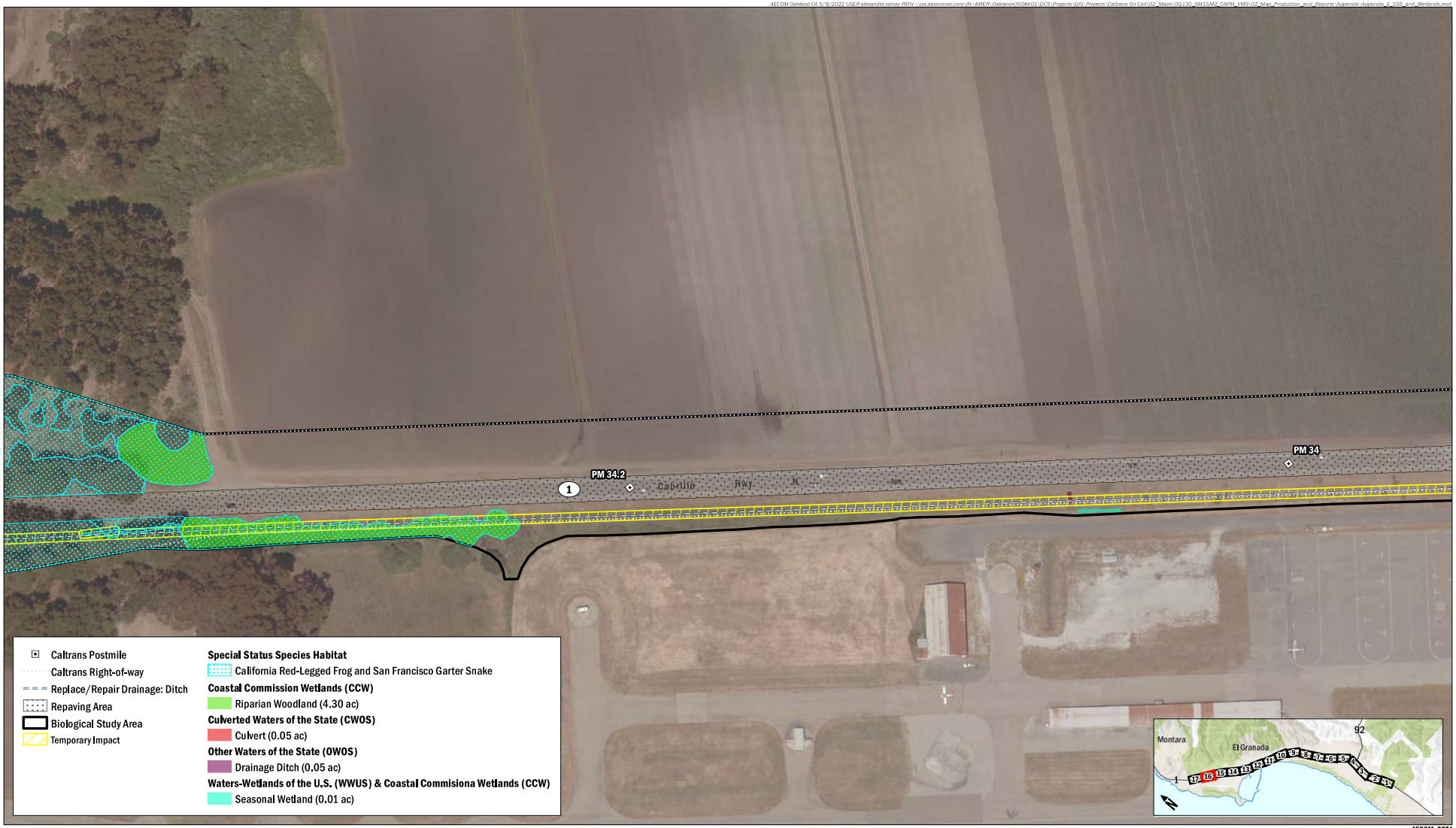
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PM 34.2
PM 34
1
Cabrillo Hwy N
Caltrans Postmile
Caltrans Right-of-way
Replace/Repair Drainage: Ditch
Repaving Area
Biological Study Area
Temporary Impact
Special Status Species Habitat
California Red-Legged Frog and San Francisco Garter Snake
Coastal Commission Wetlands (CCW)
Riparian Woodland (4.30 ac)
Culverted Waters of the State (CWOS)
Culvert (0.05 ac)
Other Waters of the State (OWOS)
Drainage Ditch (0.05 ac)
Waters-Wetlands of the U.S. (WWUS) & Coastal Commisiona Wetlands (CCW)
Seasonal Wetland (0.01 ac)
Montara
El Granada
92
0
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Feet
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