EUREKA SLOUGH BRIDGES GEOTECHNICAL INVESTIGATION

Humboldt Bay Harbor, Recreation, and Conservation District Development Permit Application

Attachment 7, Technical Reports and Supporting Documents

1. Natural Environment Study/Natural Environment Study Addendum
2. Cultural Screening Memo
3. Initial Site Assessment
4. NMFS Letter of Concurrence

EUREKA SLOUGH BRIDGES
GEOTECHNICAL INVESTIGATION

NATURAL ENVIRONMENT STUDY

HUMBOLDT COUNTY, CA

01-HUM-101—POST MILES 79.50 / 80.20

EA 01-0F200 / EFIS 01-1500-0088

February 2023

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

NATURAL ENVIRONMENT STUDY

EUREKA SLOUGH BRIDGES GEOTECHNICAL INVESTIGATION

HUMBOLDT COUNTY, CA

01-HUM-101—POST MILES 79.50 / 80.20

EA 01-0F200 / EFIS 01-1500-0088

February 2023

STATE OF CALIFORNIA

Prepared By: Christine Hamilton Date: 2/17/2023

Christine Hamilton, Environmental Scientist
North Region Environmental–District 1, Branch E3
(707) 815-5917

Recommended for Approval By: _____ Date: 2/16/2023

Amon Armstrong, Environmental Scientist
North Region Environmental–District 1, Branch E1
(707) 815-6489

Approved By: _____ Date: 2/17/2023

Jason Meyer, Senior Environmental Scientist
Branch Chief E3
North Region Environmental–District 1, Branch E3
(707) 572-7039

For individuals with sensory disabilities, this document is available in Braille, in large print, or in digital format. To obtain a copy in one of these alternate formats, please write to or call Caltrans, Attention: Myles Cochrane, Public Information Office, 1656 Union Street, Eureka, CA 95501; (707) 445-6312 Voice, or use the California Relay Service TTY number, 711 or 1-800-735-2929.

SUMMARY

The California Department of Transportation (Caltrans) proposes to conduct a geotechnical investigation to support the design and construction of two to three bridges to replace the existing northbound and southbound bridges crossing Eureka Slough. The project is located in Humboldt County, U.S. Highway 101, between post miles (PMs) 79.50 and 80.20.

The purpose of this project is to address seismic deficiencies, as well as improve the function and geometrics of the Eureka Slough Bridges to ensure uninterrupted traffic movement in the event of a collision or emergency incident, earthquake, or any other catastrophic event. Replacement structures built to current standards with separated pedestrian pathways would promote and enhance mobility for all modes of transportation. The southbound structure, built in 1943, has seismic deficiencies, is fracture critical and has a non-standard profile which contributes to a collision rate at the bridge departure that is double the statewide average for similar facilities. The northbound structure, built in 1956, also has seismic deficiencies and has non-standard bridge rails built on raised concrete curbs within the shoulders. Both structures have exceeded their design life and have narrow shoulders that impede multimodal transportation.

This Natural Environment Study (NES) was prepared to identify existing biological resources, assess potential impacts, and identify permitting requirements for the geotechnical investigation. The NES provides information about the existing environment within the project area, including special status botanical and wildlife species and their associated habitats and other sensitive habitats present in the vicinity of the project that could potentially be affected by the geotechnical investigations.

The Environmental Study Limits (ESL) is the area encompassing the project footprint where there could be direct and indirect disturbance by geotechnical investigations. The Biological Study Area (BSA) consists of a 165-foot (50 meter) buffer around the ESL to account for Coastal Zone and noise impacts from the project.

There would be approximately 0.11 acre of temporary impacts to the Pickleweed Mats Alliance Sensitive Natural Community due to geotechnical drilling and geophysical surveys. It is anticipated that minor impacts to this sensitive natural community would not be visible by the following year.

The project would have temporary and permanent impacts to Waters of the U.S. and State. In total, there would be up to approximately 0.083 acre (3,600 square feet) of temporary

impacts to wetlands and up to 1.90 square feet of permanent impacts to wetlands and other Waters of the U.S. and State.

Caltrans has determined the project ***may affect, is not likely to adversely affect*** U.S. Fish and Wildlife Service (USFWS) administered federally listed species. Consultation would be carried out through the USFWS Programmatic Letter of Concurrence for effects on the federally listed tidewater goby (*Eucyclogobius newberryi*).

Caltrans has determined the project ***may affect, is not likely to adversely affect*** National Marine Fisheries Service (NMFS) administered federally listed species and critical habitats:

- Chinook salmon (*Oncorhynchus tshawytscha*)–California Coast Evolutionarily Significant Unit (ESU) and critical habitat
- Coho salmon (*Oncorhynchus kisutch*)–Southern Oregon/Northern California Coast (SONCC) ESU and critical habitat
- North American green sturgeon (*Acipenser medirostris*)–Southern Distinct Population Segment (DPS) and critical habitat
- Steelhead trout (*Oncorhynchus mykiss irideus*)–Northern California DPS and critical habitat

Caltrans has determined the project ***may adversely affect*** Essential Fish Habitat (EFH) for:

- Chinook salmon and coho salmon
- Pacific Coast groundfish
- Coastal pelagic species

Section 7 Consultation with NMFS would be conducted for potential effects to the above NMFS-administered species and EFH.

Caltrans has determined the project would have ***no effect*** on the following federally listed species or species proposed for listing:

- Beach layia (*Layia carnosa*)
- Menzies' wallflower (*Erysimum menziesii*)
- Western lily (*Lilium occidentale*)
- East Pacific green sea turtle (*Chelonia mydas*)
- Leatherback sea turtle (*Dermochelys coriacea*)
- Olive Ridley sea turtle (*Lepidochelys olivacea*)

- California ridgeway's rail (*Rallus obsoletus obsoletus*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- Short-tailed albatross (*Phoebastria albatrus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Yellow-billed cuckoo–Western DPS (*Coccyzus americanus*)
- Pacific eulachon–Southern DPS (*Thaleichthys pacificus*)
- Pacific marten–Coastal DPS (*Martes caurina humboldtensis*)
- Blue whale (*Balaenoptera musculus*)
- Fin whale (*Balaenoptera physalus*)
- Humpback whale (*Megaptera novaeangliae*)
- North Pacific right whale (*Eubalaena japonica*)
- Sei whale (*Balaenoptera borealis*)
- Sperm whale (*Physeter macrocephalus*)
- Southern resident killer whale (*Orcinus orca*)
- Monarch butterfly (*Danaus plexippus*)

Caltrans has determined the project would have no ***take*** of the following state-listed species, species proposed for listing, candidate species, or fully protected species:

- Beach layia (*Layia carnosa*)
- Menzies' wallflower (*Erysimum menziesii*)
- Western lily (*Lilium occidentale*)
- American peregrine falcon (*Falco peregrinus anatum*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Bank swallow (*Riparia riparia*)
- California brown pelican (*Pelecanus occidentalis californicus*)
- California ridgeway's rail (*Rallus obsoletus obsoletus*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- White-tailed kite (*Elanus leucurus*)
- Yellow-billed cuckoo (*Coccyzus americanus*)
- Coho salmon (*Oncorhynchus kisutch*)–SONCC ESU
- Longfin smelt (*Spirinchus thaleichthys*)
- Steelhead trout (*Oncorhynchus mykiss irideus*)–Northern California summer run
- Pacific marten–Coastal DPS (*Martes caurina humboldtensis*)

- Crotch bumble bee (*Bombus crotchii*)
- Western bumble bee (*Bombus occidentalis*)

Caltrans has determined the project could impact the following Species of Special Concern that may occur within the project area:

- Brant (*Branta bernicla*)
- Northern harrier (*Circus hudsonius*)
- Coast cutthroat trout (*Oncorhynchus clarkii clarkii*)
- Pacific lamprey (*Entosphenus tridentatus*)
- Tidewater goby (*Eucyclogobius newberryi*)

This project could impact the following California Rare Plant Rank species that are known to occur within the project area:

- Humboldt Bay owl's-clover (*Castilleja ambigua* var. *humboldtiensis*)
- Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*)

Caltrans' Standard Measures and Best Management Practices would be implemented to avoid or minimize impacts to sensitive terrestrial and aquatic animal species, rare plant species, migratory birds, natural communities, and jurisdictional waters potentially impacted by the project.

The following permits would be required for this project:

- USFWS Programmatic Letter of Concurrence
- NMFS Section 7 Consultation
- U.S. Army Corps of Engineers Section 404 Nationwide Permit
- U.S. Army Corps of Engineers Section 10 Rivers and Harbors Act
- Regional Water Quality Control Board Section 401 Water Quality Certification
- CDFW Section 1600 Lake or Streambed Alteration Agreement
- California Coastal Development Permit

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

ABBREVIATION / ACRONYM	DESCRIPTION
ABMPs	Additional Best Management Practices
AEP	Associate Environmental Planner
BMPs	Best Management Practices
BSA	Biological Study Area
CC	California Coastal
Caltrans	California Department of Transportation
CCA	California Coastal Act
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CH	Critical Habitat
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CWA	Clean Water Act
dB	Decibels
dBA	A-weighted decibels
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EO	Executive Order
ES	Environmental Scientist
ESHA(s)	Environmentally Sensitive Habitat Area(s)
ESL	Environmental Study Limits
ESU	Evolutionarily Significant Unit
FC	Federal Candidate (ESA listing status)
FE	Federal Endangered (ESA listing status)
FESA	Federal Endangered Species Act
FP	State Fully Protected (listing status)
FR	Federal Register

ABBREVIATION / ACRONYM	DESCRIPTION
FT	Federal Threatened (ESA listing status)
G1	Global Rank – Critically Imperiled
G2	Global Rank – Imperiled
G3	Global Rank – Vulnerable
G4	Global Rank – Apparently Secure
G5	Global Rank – Demonstrably Secure
HAPC	Habitat Area of Particular Concern
IPaC	Information for Planning and Consultation (USFWS)
LSAA	Lake or Streambed Alteration Agreement
MBTA	Migratory Bird Treaty Act
MHW	Mean High Water
MMPA	Marine Mammal Protection Act
NC	Northern California
NCRWQCB	North Coast Regional Water Quality Control Board
NES	Natural Environment Study
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OHW	Ordinary High Water
OHWL	Ordinary High-Water Line
OHWM	Ordinary High-Water Mark
PLACs	Permits, Licenses, Agreements and Certifications
PLOC	Programmatic Letter of Concurrence
PM(s)	Post Mile(s)
Ppt	Parts per Thousand
RHA	Rivers and Harbors Act
RWQCB	Regional Water Quality Control Board
S1	State Rank – Critically Imperiled
S2	State Rank – Imperiled
S3	State Rank – Vulnerable
S4	State Rank – Apparently Secure
S5	State Rank – Demonstrably Secure
SC	State Candidate (ESA listing status)
SE	State Endangered (ESA listing status)
SEL	Sound Exposure Level

ABBREVIATION / ACRONYM	DESCRIPTION
SL	Seismic Line
SNC(s)	Sensitive Natural Community(ies)
SONCC	Southern Oregon/Northern California Coast
SPCC	Spill Prevention, Control, and Countermeasures
SPT	Standard Penetration Test
SSC	(State) Species of Special Concern
ST	State Threatened (ESA listing status)
SWPPP	Stormwater Pollution Prevention Plan
THVF	Temporary High Visibility Fencing
U.S. 101	U.S. Highway 101
USACE	U.S. Army Corp of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WOTUS	Waters of the United States
WPCP	Water Pollution Control Program

CHAPTER 1. INTRODUCTION

The California Department of Transportation (Caltrans) proposes a geotechnical investigation to support the design and construction of two or three bridges, to replace the existing northbound and southbound bridges crossing Eureka Slough, between post miles (PMs) 79.50 and 80.20 of U.S. Highway 101 in Humboldt County, California (Figure 1). This Natural Environment Study (NES) provides information about the natural environment, existing plant and animal species and sensitive habitats that could be affected by the proposed geotechnical investigation.

Purpose

The purpose of the geotechnical investigation is to characterize the subsurface conditions and aid in the design and construction of the proposed bridges.

Need

This project is needed to address seismic deficiencies, as well as improve the function and geometrics of the Eureka Slough Bridges to ensure uninterrupted traffic movement in the event of a collision or emergency incident, earthquake, or any other catastrophic event. Replacement structures built to current standards with separated pedestrian pathways would promote and enhance mobility for all modes of transportation. The southbound structure, built in 1943, has seismic deficiencies, is fracture critical, and has a non-standard profile which contributes to a collision rate at the bridge departure that is double the statewide average for similar facilities. The northbound structure, built in 1956, also has seismic deficiencies and has non-standard bridge rails built on raised concrete curbs within the shoulders. Both structures have exceeded their design life and have narrow shoulders that impede multimodal transportation.

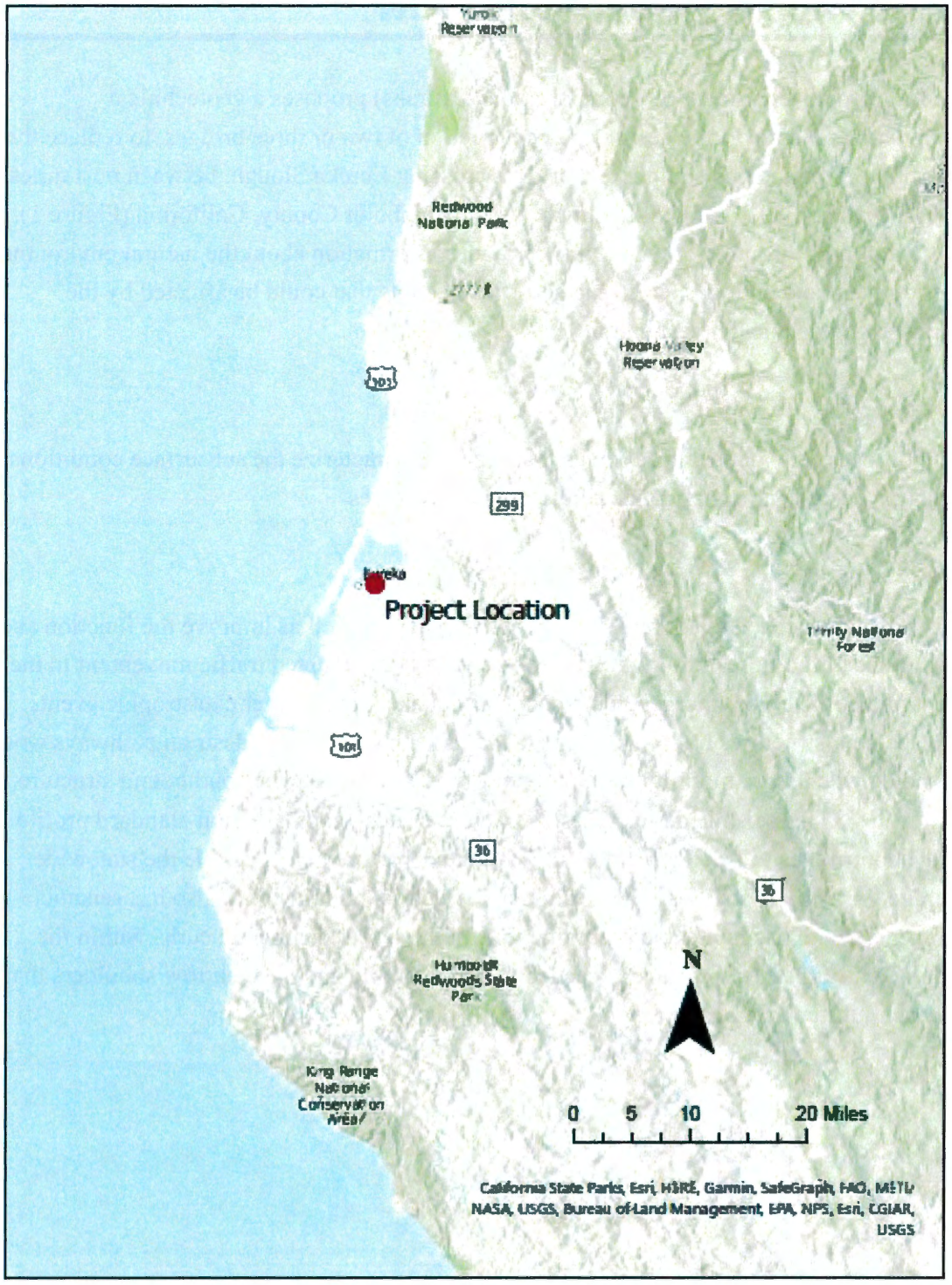


Figure 1. Project Vicinity

1.1. Project Description

To characterize and evaluate the conditions around the proposed structure foundations, a staged investigation would occur in the following order: 1) geophysical surveys, 2) geotechnical drilling, and 3) PS suspension logging[1]. Appendix A details the proposed work plan and approximate geophysical survey and geotechnical drilling locations.

Geophysical Surveys—Up to 6 geophysical surveys would occur. No earthwork would be required to access or perform the proposed surveys. Minor brushing may be required for survey lines (SL) SL-4 and SL-5 to provide unobstructed access to the ground to lay the cables. This would likely consist of an approximately 3-foot-wide strip in which vegetation would be cut to a height of 6 inches above the ground to promote regrowth.

Geotechnical Drilling—Up to 22 borings would be drilled. Depending on location, the borings would be advanced through the existing bridge deck, highway pavement surface, median strip, or vegetated area adjacent to the approach embankments. Most borings would require traffic control, either continuously or to support entrance and exit from the drill locations.

Upon completion of each geotechnical boring, soil cuttings and drilling fluid generated by the operation would be pumped and/or shoveled into 55-gallon drums for hazardous waste characterization and disposal. Any cuttings and/or drilling fluid inadvertently spilled onto the ground would similarly be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean pavement surfaces to prevent contamination of future stormwater or impacts to public safety, a minimal amount would be used and as much of the impacted water captured as practical.

Any areas of ground disturbance created during off-road drilling activities would be mitigated with appropriate Best Management Practices (BMPs) to prevent erosion and stormwater pollution. Borings not designated to receive a geophysical casing would be backfilled using neat cement grout placed at the base of the excavation. Any holes in the road surface would be patched with fast-setting cement. Any holes in the bridge deck would be back filled as previously described.

---

[1] The PS suspension logger measures compression (P) wave velocities and formation shear (S) wave downhole velocities of surrounding rock and soil from within deep uncased boreholes. This is used to determine the physical properties of soil and rock including shear modulus, bulk modulus, compressibility and Poission's ratio.

PS Suspension Logging—Downhole PS suspension logging may be conducted on two borings, B-2 and B-4. No disturbance to ground or vegetation would occur.

Construction Schedule

Investigations are anticipated to start in 2023 and expected to take approximately 20 weeks to complete. The following schedule is anticipated:

- Geophysical surveys would take approximately 12 working days.
- Geotechnical drilling would take approximately 88 working days (approximately 18 weeks).
- PS suspension logging would occur concurrently with geotechnical drilling.

The following seasonal restrictions are anticipated:

- Geotechnical drilling through the bridge deck into jurisdictional waters would occur between June 15 and October 15 at the following survey sites: B-7, B-8, B-9, B-10, B-11, B-13, B-15, B-16, and B-17.
- Vegetation clearing would occur between August 15 and March 31 to minimize the chance of disturbing nesting birds.

Staging and Access

Access and staging areas are available along the highway shoulders and in the median areas between the northbound and southbound bridges. Equipment staging and access would occur within the existing Caltrans right of way. Minor trimming of shrubs and trees may be conducted to access some locations.

Equipment, Noise Levels, and Effects on Sensitive Fish

In the following paragraphs, we describe the airborne and underwater noise levels of geotechnical equipment and potential effects on fishes.

Airborne environmental noise descriptors typically are based on human hearing. The A-scale frequency weighting network provides a single-number measure of a sound level in air across the human audible frequency spectrum but has no direct application to assessing the effects of underwater noise on fish or other marine life. Airborne noise is referred to as decibels A (dBA), and underwater noise is referred to as decibels (dB).

The threshold for injury to fish from impulsive sound waves, such as that caused by impact pile driving and blasting, occurs at sound pressure levels of 206 dB (decibels) peak and 187 dB accumulated sound exposure level (SEL) for fish over 2 grams. The threshold for behavioral effects on fish was established at 150 dB, which is also termed "effective quiet" (FHWG 2008). Currently there are no injury thresholds for fish that apply to continuous noise sources.

Geophysical Surveys— Seismic survey equipment consists of an array of 24 geophones (seismic sensors), copper stakes driven into the ground, connected by a specialized multi-electrode cable to a battery powered seismograph unit, and a seismic source. The equipment would be transported to the site in a single crew cab and transported for short distances around the site on foot.

Seismic sources would consist of either a hammer and striker plate, a downhole shotgun, or explosives. The hammer and striker plate noise occurs when a 12 - to 16-pound sledgehammer strikes the striker plate resting on the ground surface. The downhole shotgun uses an eight gauge 350 to 500-grain blank shotgun cartridge and is fired in a minimum 1.5-foot-deep water filled hole created with a hand auger. The shells are typically triggered 20 minutes apart. The explosives are small binary charges ranging between 1/6 and 1/3 of a pound. The charges would be placed by a licensed blaster in a hole 2-to 3-foot-deep bored with a hand auger. The charges would be triggered approximately 30 minutes apart. Explosives would mostly likely be required to achieve the desired results due the soft substrate expected in the project area. Typically, shotgun blasts and explosive charges would be limited to about nine per day. Additional shots may be required if desired results are not achieved.

Airborne Noise—Maximum noise levels caused by the "ping" from the hammer striking the metal plate may exceed 110 decibels (dBA) within 1 meter of the source. For the downhole shotgun or explosives which are fired into the ground, the highest anticipated noise generated consists of a muffled "thump" of approximately 80 dBA near the source. Due to the difference in acoustic impedance between air and water and the expected angle of incidence between the noise source and the water surface, most of the airborne sound waves would be reflected. The airborne component of the seismic survey noise is not expected to transmit into the water at a large enough amplitude to exceed the peak or cumulative injury thresholds for fish (R. Pommerenck, pers. comm.).

Underwater Noise— Seismic lines would be placed as close as twenty feet to the edge of water and the seismic survey will generate vibration in the substrate which could radiate into

the water column. The amount of vibration transmitted depends on the amount of energy imparted into the ground during generation of the seismic waves, substrate composition, depth of water at the ground water interface, and distance from the water.

No underwater noise data is available for seismic surveys to evaluate effects on fish. However, we can use the information from impact pile driving of small piles near water as a surrogate for the seismic survey (Caltrans 2015). For impact driving of small 12-inch concrete piles within 20 feet of the water, the peak sound pressure level was 176 dB and the cumulative level was 146 dB SEL, below the injury and behavioral thresholds for fish. Larger steel pipe piles (66-inch to 87-inch) adjacent to land remained below injury thresholds but exceeded the 150 dB effective quiet level (160 to 175 dB SEL). Considering the size of the hammer used on the striker plate and the relatively small charges used to produce seismic waves, the amplitude of the groundborne vibration caused by the seismic survey would be substantially less than from impact pile driving near water. In addition, the number of strikes for the seismic surveys (approximately 9 per day), would be far less than what is typically conducted for pile driving (typically hundreds). Based on this information, it is anticipated that injury and behavioral thresholds for fish would not be exceeded.

Geotechnical Drilling— Equipment would include a track or truck-mounted drill rig equipped with a Standard Penetration Test (SPT) hammer, a water truck, and a crew cab. Portable ground protection mats may be used to aid vehicular access and protect soft ground surfaces. Visqueen plastic sheeting and straw wattle would be used to contain any drilling fluid or impacted water for clean-up.

There are limited data for underwater noise impacts associated with geotechnical drilling activities. Airborne and underwater noise measurements conducted at a Washington Department of Transportation (WSDOT) project during geotechnical drilling operations was summarized in a draft technical advisory (Caltrans 2019b). This technical advisory provides the latest available information on noise impacts from geotechnical drilling.

During geotechnical boring there are two distinct noise sources, drilling and hammering. Noise from the drilling operation is considered a continuous noise similar to vibratory pile driving. Noise from the hammering operation is considered an impulsive noise source similar to impact pile driving. The hammer is a small low energy impact device that requires few daily strikes.

Airborne Noise— Caltrans District 4 reported maximum noise levels of 69 dBA from drilling and 73 dBA from hammering at 50 feet from the source, produced by a Mobile B-47 drill rig equipped with an SPT hammer (Appendix A). Similarly, maximum noise levels of 66 dBA

from drilling and 75 dBA from hammering were reported at 124 feet from the source at the WSDOT project. Airborne noise is not expected to exceed ambient noise conditions or transmit into the water with large enough amplitude to cause injury to fish.

Underwater Noise— Peak underwater sound pressure level during hammering was 181 dB and the cumulative level was less than 150 dB SEL measured at the WSDOT project (at 33 feet from the source in water depths of approximately 22 feet). Based on this information, it is anticipated that injury and behavioral thresholds for fish during geotechnical boring in the water would not be exceeded.

1.2. Standard Measures and Best Management Practices

The following section provides a list of project features, standard practices (measures), and Best Management Practices (BMPs) that are included as part of the project description. These avoidance and minimization measures are prescriptive and sufficiently standardized to be generally applicable and do not require special tailoring to a project situation. These are generally measures that result from laws, permits, guidelines, resource management plans, and resource agency directives and policies. They predate the project's proposal and apply to all similar projects. For this reason, these measures and practices do not qualify as project mitigation, and the effects of the project are analyzed with these measures in place. Species-specific avoidance, minimization, or mitigation measures that would be applied to reduce the effects of project impacts are listed in relevant sections of Chapter 4 and below.

Standard measures relevant to the protection of natural resources deemed applicable to the proposed project include:

Biological Resources

BR-1: General

Before start of work, as required by permit or consultation conditions, a Caltrans biologist or ECL would meet with the site investigation team to brief them on environmental permit conditions and requirements relative to each stage of the proposed project, including, but not limited to, work windows, drilling site management, and how to identify and report regulated species within the project areas.

BR-2: Animal Species

A. To protect migratory and nongame birds (occupied nests and eggs), if possible, vegetation removal would be limited to the period outside of the bird breeding season (removal would occur between September 16 and January 31). If vegetation removal is required during the bird breeding season, a nesting bird survey would be conducted by a qualified biologist within one week prior to vegetation removal. If an active nest is located, the biologist would coordinate with CDFW to establish appropriate species-specific buffer(s) and any monitoring requirements. The buffer(s) would be delineated around each active nest and construction activities would be excluded from these areas until birds have fledged, or the nest is determined to be unoccupied.

B. Artificial night lighting may be required. To reduce potential disturbance to sensitive resources, lighting would be temporary, and directed specifically on the portion of the work area actively under construction. Use of artificial lighting would be limited to Cal/OSHA work area lighting requirements.

C. A Limited Operating Period would be observed, whereby all in-stream work below ordinary high water (OHW) would be restricted to the period between June 15 and October 15 to protect water quality and vulnerable life stages of sensitive fish species.

BR-3: Invasive Species

All equipment would be thoroughly cleaned of all dirt and vegetation prior to entering the job site to prevent importing invasive non-native species. Project personnel would adhere to the latest version of the *California Department of Fish and Wildlife Aquatic Invasive Species Cleaning/Decontamination Protocol (Northern Region)* for all field gear and equipment in contact with water.

Additional Measures to Protect Rare Plant Species

Prior to the start of work, flagging would be installed around Humboldt Bay owl's clover and Point Reyes bird's-beak occurrences that are within the ESL and no drilling or heavy equipment would occur in these areas. Geophysical surveys consisting of foot traffic to lay cables, geophones, and strike plates would be allowed in or adjacent to occurrences.

Additional Measures to Protect Aquatic Resources

- Before geotechnical activities begin, the project environmental coordinator or biologist would discuss the implementation of the required BMPs with the site investigation team and identify and document environmentally sensitive areas and potential occurrence of listed species.
- In-stream geotechnical drilling would be restricted to the period between June 15 and October 15 to protect water quality and vulnerable life stages of sensitive fish species. Geotechnical drilling restricted to this period includes drilling through the bridge deck into the slough channel.
- When geotechnical drilling takes place, drilling fluid would be made up of water, or water mixed with bentonite clay without additives. Drilling would be conducted inside a casing so that all spoils are recoverable in a collection structure. All drilling fluids and materials would be self-contained and removed from the site after use, in accordance with Caltrans Drilling Services Quality Management Plan (Caltrans 2019a).
- The boring holes would be backfilled with cement. To prevent contamination of sensitive areas with cement, for those boring holes in the slough channel, the top 20 feet would be filled with a non-toxic bentonite clay mixture. For those boring holes on land or in wetlands, the top 5 feet would be filled with native soils retained from the holes.
- The only equipment that would be parked or driven in wetlands would be a track-mounted drill rig. Temporary wetland protection mats would be used to prevent permanent damage and minimize temporary damage to wetlands from the track-mounted drill rig.
- With the exception of the track-mounted drill rig, no equipment parking or storage would occur within wetlands or special status plant communities.
- BMPs will be implemented as appropriate to control on-site and offsite releases from geotechnical drilling operations. In the event of a fluid spill, drilling will cease immediately to allow for containment and clean-up. The District 1 Spill Communication Plan will be followed, which outlines the process of spill response and notification of appropriate agencies and entities.
- Precautions during drilling will be employed to mitigate any possible equipment leaks or drilling fluid spillage. These may include, plastic tarps, absorption mats, and straw wattles where appropriate. Where risk exists of drilling fluid being

sprayed or otherwise ejected beyond the controlled work zone, into an adjacent wetland area, removable barriers, such as plastic sheeting would be deployed.

- When drilling within the slough channel, potential leakage at the casing mud-line contact will be monitored. If leakage is detected, wet drilling will be stopped and the casing will be advanced by dry drilling to a depth at which leakage has stopped (adequately sealed off).
- Equipment would be inspected on a daily basis for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials prior to operating equipment.
- Maintenance and fueling of equipment and vehicles would occur at least 50 feet (15 meters) from the Ordinary High-Water Line (OHWL) or the edge of sensitive habitats (*e.g.*, wetlands).
- Vegetation would be mowed or trimmed to a height greater than 4 inches. Existing vegetated areas would be maintained to the maximum extent practicable.

CHAPTER 2. STUDY METHODS

This chapter describes the regulatory requirements relative to protected biological resources at the federal, state and local level and presents the methods used to identify and evaluate the potential presence and direct or indirect impacts to protected resources, including sensitive natural communities, special status plants and animals, and jurisdictional waters and/or wetlands within or adjacent to the project area. This chapter also describes the study area.

2.1. Project Parameter Definitions

When determining the parameters of a project for potential impacts, the following definitions are provided:

Project Area: This is the general area where the project is located. This term is mainly used in the Environmental Setting section (e.g., watershed, climate type, etc.).

Project Limits: This is the beginning and ending post miles for a project. This is different than the Environmental Study Limits (ESL) in that it sets the beginning and ending limits of a project along the highway. It is the limits programmed for a project, and every report, memo, etc. associated with a project should use the same post mile limits. In some cases, there may be areas associated with a project that are outside of the project limits, such as staging and disposal locations.

Project Footprint: The area within the ESL the project is anticipated to impact, both temporarily and permanently. This includes staging and disposal areas.

Environmental Study Limits (ESL): The Project Engineer provides the Environmental team the ESL as an anticipated boundary for potential impacts. The ESL is *not* the project footprint. Rather, it is the area encompassing the project footprint where there could *potentially* be direct and indirect disturbance by construction activity. The ESL is larger than the project footprint to accommodate any future scope changes. The ESL is also used to identify the Biological Study Area.

Biological Study Area (BSA): The BSA includes areas within and adjacent to the ESL where standard environmental assessments for sensitive resources (habitats, plants, wildlife, wetlands and other waters, etc.) are conducted. The BSA encompasses the ESL plus any areas outside of the ESL that could be affected by the project (e.g., noise, visual, Coastal Zone, etc.). The BSA considers elements of construction that reach beyond the immediate construction footprint, such as elevated noise levels and modifications to surface and

subsurface hydrology, or permanent and temporary changes in solar or sound exposure. For example, several sensitive wildlife species could be vulnerable to indirect impacts outside the construction footprint resulting from increased noise or vibration during construction. Likewise, sensitive plants could be impacted by changes in solar exposure or surface and subsurface hydrology. When there is more than one type of potential impact or several resources with different sensitivities outside of the ESL, more than one type of BSA may be defined and analyzed. The potential for both direct and indirect impacts is considered when determining the BSA. Depending on resources in the area, a project could have multiple BSAs.

Action Area: The action area, as defined under the Federal Endangered Species Act (FESA), includes those areas that would be affected directly or indirectly by the federal action and not merely the immediate area involved in the action [50 Code of Federal Regulations [CFR] § 402.02]. The action area is determined, in part, by the activities associated with the proposed action and the site geography, topography, and hydrology, along with an understanding of the distribution, habitat requirements, phenology, and vulnerability of federally listed species potentially occurring near the proposed action.

2.2. Project Environmental Study Limits and Biological Study Area

For the project, the ESL is the area encompassing the project footprint where there could be direct and indirect disturbance by geotechnical exploration (Figure 2). Within the ESL, project impacts are anticipated from geotechnical exploration, noise disturbance, equipment staging, and access routes. For the project, the BSA is the area where sound levels from geotechnical exploration would be expected to extend beyond the source and potentially impact terrestrial and aquatic species (Figure 2). In addition, the project is within the Coastal Zone, requiring a minimum of a 100-foot buffer. The BSA consists of a 165-foot (50 meter) buffer around the ESL.

Figure 2. Environmental Study Limits and Biological Study Area

2.3. Regulatory Requirements

Special status habitats, plant and animal species have varying degrees of legal protection under numerous laws and regulations. All federal and state resource agencies require avoidance and minimization of effects to special status species and their habitat.

The federal regulatory requirements and laws related to biological resources that apply to the proposed project include:

- Clean Water Act (CWA), Sections 404 and 401
- Coastal Zone Management Act
- Executive Order 11990 (Protection of Wetlands)
- Executive Order 13112 (Invasive Species)
- Federal Endangered Species Act (FESA)
- Magnuson-Stevens Fishery Conservation and Management Act, as amended
- Marine Mammal Protection Act (MMPA)
- Migratory Bird Treaty Act (MBTA)
- National Environmental Policy Act

The applicable state laws and regulations include:

- California Coastal Act (CCA)
- California Endangered Species Act of 1984 (CESA)
- California Environmental Quality Act (CEQA)
- California Fish and Game Code (CFGC) Section 1600 (Conservation of fish and wildlife)
- CFGC Section 1913 (Rare or endangered plant protection)
- CFGC Sections 3513 and 3800 (Migratory bird protections)
- Porter-Cologne Water Quality Control Act
- Native Plant Protection Act of 1977

2.4. Permits

Environmental Permits, Licenses, Agreements and Certifications (PLACs) needed for construction of the proposed project include:

Table 1. Permits, Licenses, Agreements, and Certifications for the Eureka Slough Bridge Geotechnical Investigation

Agency	Permit/Approval	Status
U.S. Army Corps of Engineers	Section 404 authorization - Nationwide Permit 6	Target submittal 2/15/2023
National Marine Fisheries Service	Section 7 Consultation for Threatened and Endangered Species, Critical Habitat, and Essential Fish Habitat	Target submittal 2/15/2023
U.S. Fish and Wildlife Service	Programmatic Letter of Concurrence	Target submittal 2/15/2023
Regional Water Quality Control Board	Section 401 Water Quality Certification	Target submittal 2/15/2023
California Coastal Commission	Coastal Development Permit	Target submittal 2/15/2023
California Department of Fish and Wildlife	1602 Agreement for Lake or Streambed Alteration	Target submittal 2/15/2023

2.5. Studies Required

To comply with the provisions of various federal and state environmental statutes and Executive Orders (EOs), potential impacts to natural resources within the project area were investigated and documented.

2.5.1 Records Search

Special status plant and animal species and sensitive habitats that may occur within the BSA were determined, in part, by reviewing natural resource agency databases, literature, and other relevant sources. The following resources were reviewed:

- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation database species list for the project area (USFWS 2023) (Appendix B).
- National Marine Fisheries Service (NMFS) species list for the Eureka U.S. Geological Survey (USGS) 7.5-minute quadrangle (quad) (NMFS 2023) (Appendix C).

- California Natural Diversity Database (CNDDB) RareFind occurrence records for the Eureka quad and surrounding five coastal quads: Tyee City, Arcata North, Arcata South, Fields Landing, and Cannibal Island (CDFW-CNDDB 2023) (Appendix D).
- California Native Plant Society (CNPS) occurrence records for the Eureka quad and surrounding five coastal quads: Tyee City, Arcata North, Arcata South, Fields Landing, and Cannibal Island (CNPS 2023) (Appendix E).
- National Wetlands Inventory Mapper (USFWS 2022a) (Appendix F).

2.5.2 Field Surveys

Field reviews were conducted to identify existing habitat types and natural communities, potential jurisdictional waters and wetlands, and special status species and suitable habitat.

Natural Communities Assessment

Field surveys to map vegetation types were conducted concurrently with the special status plants surveys and the wetlands delineation surveys. During the field surveys, Caltrans botanists mapped the boundaries of each vegetation type and noted dominant species and associated species.

The natural and semi-natural vegetation types within the BSA were identified using the vegetation classification and keys in Sawyer et al. (2009), and online updates (CNPS 2022). The classification is based on the dominant plant species and emphasizes natural, existing vegetation. Vegetation types within the BSA were identified at the alliance level where possible. Rarity of each vegetation type was determined from CDFW's current California Natural Communities List (CDFW 2023), the current list of vegetation Alliances, Associations, and Special Stands, which notes which vegetation types are considered sensitive. High priority SNCs are globally (G) and state (S) ranked 1 to 3, where 1 is critically imperiled, 2 is imperiled, and 3 is vulnerable. Global and state ranks of 4 and 5 are considered apparently secure and demonstrably secure, respectively.

For alliances with State ranks of S1, S2, and S3, all associations within them are also considered sensitive. Alliances that are not sensitive may have associations within them that are sensitive; therefore, the natural vegetation types were identified to the association level as far as possible and where necessary to determine if sensitive associations are present. Other sensitive habitat areas include riparian habitats, which are regulated by the California Department of Fish and Wildlife (CDFW) and the Regional Water Quality Control Board (RWQCB).

Jurisdictional Wetlands and Waters Delineation

The ESL and BSA were surveyed for jurisdictional aquatic resources that may be impacted by the project. This included an assessment for the following:

- Any wetland or non-wetland Waters of the U.S. (WOTUS) subject to jurisdiction of the U.S. Army Corps of Engineers (USACE) pursuant to Section 404 of the CWA
- Any "Navigable Waters" subject to the ebb and flow of the ocean tide pursuant to Section 10 of the Rivers and Harbors Act (RHA)
- Any wetland or non-wetland Waters of the State subject to the jurisdiction of the RWQCB pursuant to the Porter-Cologne Water Quality Control Act and Section 401 of the CWA
- Any coastal wetlands within the Coastal Zone subject to the jurisdiction of the California Coastal Commission (CCC) pursuant to the CCA
- Any aquatic resources with a defined bed, bank, channel, or riparian habitats subject to the jurisdiction of the CDFW pursuant to Fish and Game Code Section 1602.

Wetland delineations were performed in accordance with methods described in *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010). The USACE methodology relies on a three-parameter approach in which criteria for hydrophytic vegetation, hydric soils, and wetland hydrology must each be met to conclude an area qualifies as a wetland.

The boundaries of non-wetland WOTUS or Waters of the State were delineated at the ordinary high-water mark (OHWM) in accordance with the USACE Regulatory Guidance Letter 05-05 (USACE 2005) and *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States* (Mersel and Lichvar 2014). The OHWM represents the limit of USACE or RWQCB jurisdiction over non-tidal waters (e.g., rivers).

The boundaries of "navigable waters" subject to Section 10 of the RHA were determined based on the elevation of the Mean High Water (MHW) line. The MHW was primarily determined using bathymetric survey data provided by Caltrans engineers and was confirmed on-site based on the location of wrack, watermarks on hardscape, and/or other identifying characteristics.

Coastal wetlands regulated by the CCC under the CCA include one- and two-parameter wetlands, in addition to the three-parameter wetlands regulated as WOTUS. Coastal wetlands require the presence of wetland hydrology included on the delineation map. Coastal wetlands were evaluated as part of the routine on-site determination for WOTUS. If a potential aquatic feature met only the hydrology parameter or hydrology plus one other parameter, the feature was mapped as a potential coastal wetland.

Botanical Surveys and Habitat Assessments

Occurrence records of special status plant species were queried prior to conducting field surveys to assist in determining which species may occur within the ESL. The sources that were utilized are listed in Section 2.5.1.

Seasonally appropriate floristic botanical surveys were conducted within the ESL to detect any special status plant species that may be impacted by the project. Botanical surveys were conducted in accordance with *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2018). Resources used to identify plants included The Jepson Manual (Baldwin et al. 2012), and internet sources, such as the Consortium of California Herbaria (2021) and Calflora (2021).

Floristic surveys were initially conducted by Caltrans biologists and ICF (contractor) in 2013 and 2014, and Caltrans biologists conducted updated floristic surveys in 2020 and 2021. Surveys were timed to coincide with the flowering periods of the special status plant species that could occur within the ESL. During the field surveys, the botanists recorded all plants observed within the project ESL. Nomenclature follows The Jepson Manual (Baldwin et al. 2012) and updates published online by the Jepson Flora Project (2023).

Special Status Animal Surveys and Habitat Assessments

Occurrence records of special status animal species were queried prior to conducting field surveys to assist in determining which species may occur within the ESL and BSA. The sources that were utilized are listed in Section 2.5.1. Habitat suitability within the BSA was assessed to determine potential presence of special status animals.

2.5.3 Personnel and Survey Dates

Survey dates, type of survey conducted, and survey personnel are listed in Table 2 .

Table 2. Dates of Surveys Conducted, Type of Survey, and Personnel

Date	Survey Conducted	Personnel (Caltrans)
June 8, 2020	Habitat and Species Drone Survey	Jeff Wright, Environmental Scientist (ES); Jason Frederickson, ES; Christine Hamilton, ES
June 10, 2020	Botanical Survey	Hilary Hodson, Associate Environmental Planner (AEP); Andrea Poteet, ES; Christine Hamilton, ES
May 13, 2021	Botanical Survey	Hilary Hodson, AEP; Andrea Poteet, ES
May 18, 2021	Botanical Survey	Hilary Hodson, AEP; Andrea Poteet, ES
June 4, 2021	Botanical Survey	Hilary Hodson, AEP; Christine Hamilton, ES
June 8, 2021	Bat Survey	Jim McIntosh, ES; Denise Walker-Brown, ES; Christine Hamilton, ES
June 14, 2021	Botanical Survey	Hilary Hodson, AEP; Andrea Poteet, ES; Christine Hamilton, ES
June 29, 2021	Wetlands and Waters Delineation	Hilary Hodson, AEP; Christine Hamilton, ES; Stephanie Frederickson, ES
June 30, 2021	Botanical Survey	Hilary Hodson, AEP; Andrea Poteet, ES; Christine Hamilton, ES
August 3 and September 2, 2022	Natural Communities Mapping	Hilary Hodson, AEP; Christine Hamilton, ES

2.6. Agency Coordination and Professional Contacts

The following table indicates the coordination effort, date of coordination, and participating agencies and personnel.

Table 3. Agency Coordination and Professional Contacts

Date	Coordination Effort	Personnel
June 10, 2022	Site visit and tidewater goby discussion	Greg Schmidt – USFWS Biologist Brad Nissen – USFWS Biologist Christine Hamilton – Caltrans Biologist Susan Leroy – Caltrans Biologist
October 10, 2022	Phone meeting with NMFS to discuss Section 7 consultation	Mike Kelly – NMFS Christine Hamilton – Caltrans
October 21, 2022	Phone meeting with CDFW to discuss sensitive habitats and species	Greg O'Connell – CDFW Biologist Felicia Zimmerman – Caltrans Christine Hamilton – Caltrans
November 7, 2022	Site visit with CDFW for sensitive habitats and species discussion	Greg O'Connell – CDFW Biologist Corianna Flannery – CDFW Biologist Felicia Zimmerman – Caltrans Christine Hamilton – Caltrans

2.7. Limitations That May Influence Results

Changes in the proposed project scope could result in changes to the assessments identified in this document. If any changes are made or additional work added, this NES would no longer be considered valid and an Addendum or updated NES would be required.

CHAPTER 3. ENVIRONMENTAL SETTING

The environmental setting describes the region in which the project would occur, and the natural resources present within the Biological Study Area (BSA) to inform the potential impacts from the proposed project.

3.1. Description of Existing Biological and Physical Conditions

3.1.1. Physical Conditions

The project is along U.S. Highway 101 (U.S. 101) in Humboldt County between post miles (PMs) 79.50 and 80.20. Humboldt Bay is the second largest coastal estuary in California, approximately 14 miles long and 4.5 miles wide at the widest point, and consists of three subbasins—South Bay, Entrance Bay, and Arcata Bay (Barnhart et al., 1992). Entrance Bay is a narrow deeper channel used for shipping and boating; South Bay and Arcata Bay are much shallower and wider, containing mudflats interlaced with drainage channels surrounded by salt marshes. These channels and marshes within Humboldt Bay were manipulated with berms and dikes beginning in the late 1800s, reducing the area of marshland surrounding Humboldt Bay by nearly 90 percent (Barnhart et al., 1992).

The Eureka Slough Bridge spans the area where Freshwater Creek flows into the southeast corner of Arcata Bay. The project area contains a shallow tidal channel, intertidal mudflats, eelgrass (*Zostera* spp.) beds, and salt marshes around the fringes. The salt marsh on the northwest side of U.S. 101 is within the Humboldt Bay National Wildlife Refuge. Upland areas of the project adjacent to U.S. 101 consist of fill placed for highway construction and urban development, ruderal vegetation, and some low areas with wetlands paralleling U.S. 101.

Urban development is present adjacent to U.S. 101, including a Target store and parking lot, a number of small commercial businesses, and an RV park. The Eureka Waterfront Trail passes under the south side of Eureka Slough Bridge. The old railroad bridge crosses Eureka Slough approximately 675 feet to the north of Eureka Slough Bridge.

3.1.2. Biological Conditions

Humboldt Bay's diverse habitats consisting of intertidal mudflat, subtidal channels, eelgrass, salt marsh, and wetlands support numerous species of resident and migratory shorebirds, waterfowl, marine mammals, fish and invertebrate species. All of these habitat types are present within Eureka Slough and the BSA.

One hundred thirteen fish species from 43 taxonomic families have been recorded using Humboldt Bay for foraging, breeding, and/or as a nursery area (Gotshall et al., 1980; Fritzsche and Cavanagh 1995; Pinnix et al., 2004). Anadromous, freshwater and estuarine species that have been reported within Humboldt Bay include brook lamprey (*Lampetra richardsoni*), threespine stickleback (*Gasterosteus aculeatus*), topsmelt (*Atherinops affinis*), surf smelt (*Hypomesus pretiosus*), longfin smelt (*Spirinchus thaleichthys*), prickly sculpin (*Cottus asper*), Pacific staghorn sculpin (*Leptocottus armatus*), Pacific herring (*Clupea pallasii*), starry flounder (*Platichthys stellatus*) bay pipefish, (*Syngnathus leptorhynchus*), northern anchovy (*Engraulis mordax*), sand lance (*Ammodytidae* sp.), coastal cutthroat trout (*Oncorhynchus clarkii clarkii*), steelhead (*Oncorhynchus mykiss*), coho salmon (*Oncorhynchus kisutch*), Chinook salmon (*Oncorhynchus tshawytscha*), and tidewater goby (*Eucyclogobius newberryi*) (Wallace and Allen 2012; Barnhart et al., 1992; Schlosser and Eicher 2012). Commercially and recreationally important species that utilize subtidal areas include Dungeness crab (*Cancer magister*), Pacific herring (*Clupea pallasii*), rockfish (*Sebastes* spp.) and California halibut (*Paralichthys californicus*). Oyster culture occurs in several areas of Arcata Bay.

Common shorebird species known to occur in Humboldt Bay on intertidal mudflats include dunlin (*Calidris alpina*), western sandpiper (*Calidris mauri*), least sandpiper (*Calidris minutilla*), black-bellied plover (*Pluvialis squatarola*), short-billed dowitcher (*Limnodromus griseus*), sanderling, willet (*Tringa semipalmata*), marbled godwit (*Limosa fedoa*), black turnstone (*Arenaria melanocephala*), killdeer (*Charadrius vociferus*), and northern phalarope (*Phalaropus lobatus*) (Monroe et al., 1973). Humboldt Bay is an important wintering ground for many of these species.

Natural Communities

The ESL and BSA primarily consist of coastal estuarine habitats typical of Humboldt Bay, including large swaths of invasive species Chilean cordgrass (*Spartina densiflora*) with numerous patches of typical native saltmarsh vegetation. Dominant species in the native saltmarsh vegetation include pickleweed (*Sarcocornia pacifica*) and salt grass (*Distichlis spicata*), and two sensitive plant species, Humboldt Bay owl's-clover (*Castilleja ambigua* var. *humboldtiensis*) and Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*).

Upland habitat is generally disturbed and dominated by a variety of non-native and invasive plant species commonly seen in fill-slopes along the roads and other developments. Several native coastal shrub species, including California blackberry (*Rubus ursinus*), salmon berry (*Rubus spectabilis*) and thimbleberry (*Rubus parviflorus*), were observed along the banks of the highway shoulder and in some lower elevation areas around the bay. Some native vegetation has been used for landscape planting, such as red alder (*Alnus rubra*) and wax myrtle (*Morella californica*) trees alongside the Target store. Native vegetation in the fill slope includes several coastal shrub species that can take advantage of disturbed habitats.

The following Natural Communities were observed within the BSA:

- Common Velvet Grass (*Holcus lanatus*) Sweet Vernal Grass (*Anthoxanthum odoratum*) Semi-Natural Alliance / Common Velvet Grass – Sweet Vernal Grass Semi-Natural Association
- Monterey Cypress (*Hesperocyparis macrocarpa*) – Monterey Pine (*Pinus radiata*) Semi-natural Alliance / Monterey Pine Provisional Semi-Natural Association
- Pickleweed (*Sarcocornia pacifica*) Mats Alliance
    - Pickleweed – saltmarsh dodder (*Cuscuta saline*) – dense-flowered cordgrass (*Spartina densiflorus*) Association
    - Pickleweed – saltgrass (*Distichlis spicata*) Association
    - Pickleweed – marsh jaumea (*Jaumea carnosa*) Association
    - Pickleweed – seaside arrowgrass (*Triglochin maritima*) Association
- Salal (*Gaultheria shallon*) – Berry (*Rubus ursinus*) Brambles Alliance / Thimbleberry (*Rubus parviflora*) Association

- Smooth or Chilean Cordgrass (*Spartina densiflora*) Marshes Alliance / Chilean Cordgrass Semi-Natural Association
- Soft and Western Rush Juncus (*effusus, patens*) – Carex (*pansa, praegracilis*) Sedge marshes Alliance / Soft rush (*Juncus effusus*) Association
- Typha (*angustifolia – domingensis - latifolia*) Cattail Marshes Alliance / Typha (*angustifolia-latifolia*) Cattail Marshes Association

Ruderal Habitat

Ruderal vegetation includes disturbed/non-native annual grasslands, or infestations of other weedy vine species and non-native tree species planted for landscaping and wind breaks. Tree species Monterey cypress (*Hesperocyparis macrocarpa*) and Monterey pine (*Pinus radiata*) occur within the BSA. Dominant herbaceous species in the ruderal areas include non-native sweet vernal grass (*Anthoxanthum odoratum*), rattlesnake grass (*Briza maxima*), and velvet grass (*Holcus lanatus*); poison hemlock (*Conium maculatum*); weedy vines, including periwinkle (*Vinca major*), English ivy (*Hedera helix*); and patchy shrubs, including mustard (*Brassica nigra*) and cotoneaster (*Cotoneaster* sp.). The few interspersed native species include coyote brush (*Baccharis pilularis*), coffee berry (*Frangula californica*), and wax myrtle (*Morella californica*).

Habitat Connectivity

Eureka Slough connects Humboldt Bay to Freshwater Creek, providing important connectivity for salmonids that use the creek for spawning and rearing habitat. Humboldt Bay mudflats provide important wintering grounds for migratory shorebirds. Eelgrass beds in Humboldt Bay are important feeding grounds for brant geese (*Branta bernicla*) during spring migration.

3.2. Regional Species and Habitats

Special Status Plant Species

For the purposes of this evaluation, "special status plants" are those species that are legally protected or prioritized under the regulations addressed in Section 2.2. Special status plant species reviewed in this NES include:

- Listed or proposed for listing as threatened or endangered under FESA, or candidates for possible future listing as threatened or endangered under FESA
- Listed or proposed for listing by the State of California as threatened or endangered under CESA
- Listed as rare under the California Native Plant Protection Act.
- Meets the definition of endangered, rare, or threatened species under CEQA, which may include:
    - Plant species with a California Rare Plant Rank (CRPR) 1 or 2
    - Plants that may warrant consideration on the basis of declining trends, recent taxonomic information, or other factors. This includes plants with a CRPR 3 or 4.
    - Considered locally significant; plants that are not rare from a statewide perspective but are rare or uncommon in a local context, such as within a county or region (CEQA Guidelines § 15125, subd. (c)), or as designated in local or regional plans, policies, or ordinances. Examples include plants that are at the outer limits of their known geographic range or plants occurring on an atypical soil type.

Based on the queries made to USFWS, NMFS, CDFW–CNDDB databases, and the CNPS rare plant inventory, 12 special status plant species were identified as potentially occurring within the Biological Study Area (BSA) (Table 4). Potential impacts from the project on two special status plant species that are known to occur within the project area, Humboldt Bay owl's clover and Point Reyes bird's-beak, are evaluated in Chapter 4. Those species that were not observed during botanical surveys, the species is outside of the elevation and/or geographic range of the BSA, or there is no suitable habitat within the study area or related BSA are not discussed in Chapter 4.

Table 4. Special Status Plants and Critical Habitat Potentially Occurring or Known to Occur within the Project Area

Common Name	*Scientific Name*	Status[1] Federal/ State/ CRPR	Habitat/ Elevational Range (feet)	Habitat[2] Present/ Absent	Rationale
VASCULAR PLANTS					
Alpine marsh violet	*Viola palustris*	--/--/2B.2	Bogs and fens, coastal scrub 0-490 ft (0-150 m)	Absent	No suitable habitat within ESL.
American glehnia	*Glehnia littoralis* ssp. *leiocarpa*	--/--/4.2	Coastal dunes 0-65 ft (0-20 m)	Absent	No suitable habitat within ESL.
Beach layia	*Layia carnosa*	FT/SE/1B.1	Coastal dunes, coastal scrub 0-195 ft (0-60 m)	Absent	No suitable habitat within ESL.
Bristle-stalked sedge	*Carex leptalea*	2B.2	Bogs and fens, meadows and seeps, marshes and swamps 0-2295 ft (0-700 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.
California pinefoot	*Pityopus californicus*	4.2	Broadleaf upland forest, coniferous forest 50-7300 ft (15-2225 m)	Absent	No suitable habitat within ESL.
Coast checkerbloom	*Sidalcea oregana* ssp. *eximia*	--/--/1B.2	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest 15-4395 ft (5-1340 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.
Coast fawn lily	*Erythronium revolutum*	--/--/2B.2	Bogs and fens, broadleaf upland forest, North Coast coniferous forest; mesic sites; streambanks 0-5250 ft (0-1600 m)	Absent	No suitable habitat within ESL.
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	--/--/1B.2	Coastal dunes, coastal scrub, marshes and swamps 0-100 ft (0-30 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.
Dark-eyed gilia	*Gilia millefoliata*	--/--/1B.2	Coastal dunes 5-100 ft (2-30 m)	Absent	No suitable habitat within ESL.
Dwarf alkali grass	*Puccinellia pumila*	--/--/2B.2	Marshes and swamps 5-35 ft (1-10 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.

Common Name	*Scientific Name*	Status[1] Federal/ State/ CRPR	Habitat/ Elevational Range (feet)	Habitat[2] Present/ Absent	Rationale
Ghost-pipe	*Monotropa uniflora*	--/--/2B.2	Broadleaf upland forest, North Coast coniferous forest 35-1805 ft (10-550 m)	Absent	No suitable habitat within ESL.
Harlequin lotus	*Hosackia gracilis*	--/--/4.2	Broadleaf upland forest, cismontane woodland, North Coast and closed-cone coniferous forest, coastal scrub, coastal prairie, marshes, swamps, meadows, seeps, valley and foothill grassland 0-2295 ft (0-700 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.
Heart-leaved twayblade	*Listera cordata*	--/--/4.2	Bogs and fens, lower and North Coast coniferous forest 15-4495 ft (5-1370 m)	Absent	No suitable habitat within ESL.
Howell's montia	*Montia howellii*	--/--/2B.2	Meadows and seeps, North Coast coniferous forest, vernal pools; vernally wet sites often on compacted soil, pebbly roadsides 0-2740 ft (0-835 m)	Absent	No suitable habitat within ESL.
Humboldt Bay owl's-clover	*Castilleja ambigua* var. *humboldtiensis*	--/--/1B.2	Marshes and swamps 0-10 ft (0-3 m)	Present	Suitable habitat within ESL. Detected during surveys.
Kellogg's lily	*Lilium kelloggii*	--/--/4.3	Lower montane and North Coast coniferous forest 10-4265 ft (3-1300 m)	Absent	No suitable habitat within ESL.
Leafy-stemmed mitrewort	*Mitellastra caulescens*	--/--/4.2	Broadleaf upland forest, lower montane and North Coast coniferous forest, meadows, seeps 15-5580 ft (5-1700 m)	Absent	No suitable habitat within ESL.
Lyngbye's sedge	*Carex lyngbyei*	--/--/2B.2	Marshes and swamps 0-35 ft (0-10 m)	Present	Potentially suitable habitat within ESL. Not detected during surveys.

Common Name	*Scientific Name*	Status[1] Federal/ State/ CRPR	Habitat/ Elevational Range (feet)	Habitat[2] Present/ Absent	Rationale
Maple-leaved checkerbloom	*Sidalcea malachroides*	--/--/4.2	Broadleaf upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, riparian woodland 0-2395 ft (0-730 m)	Absent	No suitable habitat within ESL.
Marsh pea	*Lathyrus palustris*	--/--/2B.2	Bogs and fens, coastal prairie, coastal scrub, lower montane and North Coast coniferous forest, marshes and swamps 5-330 ft (1-100 m)	Present	Potentially suitable habitat within ESL. Not detected during surveys.
Menzies' wallflower	*Erysimum menziesii*	FE/SCE/1B.1	Coastal dunes 0-115 ft (0-35 m)	Absent	No suitable habitat within ESL.
Nodding semaphore grass	*Pleuropogon refractus*	--/--/4.2	Lower montane and North Coast coniferous forest, meadows and seeps, riparian forest 0-5250 ft (0-1600 m)	Absent	No suitable habitat within ESL.
Northern clustered sedge	*Carex arcta*	--/--/2B.2	Bogs and fens, North Coast coniferous forest 195-4595 ft (60-1400 m)	Absent	No suitable habitat within ESL.
Northern meadow sedge	*Carex praticola*	--/--/2B.2	Meadows and seeps 0-10,500 ft (0-3200 m)	Absent	No suitable habitat within ESL.
Oregon coast paintbrush	*Castilleja litoralis*	--/--/2B.2	Coastal bluff scrub, coastal dunes, coastal scrub 50-330 ft (15-100 m)	Absent	No suitable habitat within ESL.
Pacific gilia	*Gilia capitata* ssp. *pacifica*	--/--/1B.2	Coastal bluff scrub, chaparral openings, coastal prairie, valley and foothill grassland. 15-5465 ft (5-1665 m)	Absent	No suitable habitat within ESL.
Pacific golden saxifrage	*Chrysosplenium glechomifolium*	--/--/4.3	North Coast coniferous forest, riparian forest 35-720 ft (10-220 m)	Absent	No suitable habitat within ESL.

Common Name	*Scientific Name*	Status[1] Federal/ State/ CRPR	Habitat/ Elevational Range (feet)	Habitat[2] Present/ Absent	Rationale
Perennial goldfields	*Lasthenia californica* ssp. *macrantha*	--/--/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub 15-1705 ft (5-520 m)	Absent	No suitable habitat within ESL.
Pink sand-verbena	*Abronia umbellata* var. *breviflora*	--/--/1B.1	Coastal dunes 0-35 ft (0-10 m)	Absent	No suitable habitat within ESL.
Point Reyes salty bird's-beak	*Chloropyron maritimum ssp. palustre*	--/--/1B.2	Marshes and swamps 0-35 ft (0-10 m)	Present	Suitable habitat within ESL. Detected during surveys.
Rattan's milk-vetch	*Astragalus rattanii* var. *rattanii*	--/--/4.3	Chaparral, cismontane woodland, lower montane coniferous forest 100-2705 ft (30-825 m)	Absent	No suitable habitat within ESL.
Round-headed Collinsia	*Collinsia corymbosa*	--/--/1B.2	Coastal dunes 0-65 ft (0-20 m)	Absent	No suitable habitat within ESL.
Running-pine	*Lycopodium clavatum*	--/--/4.1	Lower montane and North Coast coniferous forest, marshes and swamps 150-4020 ft (45-1225 m)	Absent	No suitable habitat within ESL.
Scouler's catchfly	*Silene scouleri* ssp. *scouleri*	--/--/2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland 0-1970 ft (0-600 m)	Absent	No suitable habitat within ESL.
Seaside bittercress	*Cardamine angulata*	--/--/2B.2	Lower montane and North Coast coniferous forest 50-3000 ft (15-915 m)	Absent	No suitable habitat within ESL.
Seaside pea	*Lathyrus japonicus*	--/--/2B.1	Coastal dunes 5-100 ft (1-30 m)	Absent	No suitable habitat within ESL.
Sea-watch	*Angelica lucida*	--/--/4.2	Coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps 0-490 ft (0-150 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.

Common Name	*Scientific Name*	Status[1] Federal/ State/ CRPR	Habitat/ Elevational Range (feet)	Habitat[2] Present/ Absent	Rationale
Short-leaved evax	*Hesperevax sparsiflora* var. *brevifolia*	--/--/1B.2	Coastal bluff scrub, coastal dunes, coastal prairie 0-705 ft (0-215 m)	Absent	No suitable habitat within ESL.
Siskiyou checkerbloom	*Sidalcea malviflora* ssp. *patula*	--/--/1B.2	Coastal bluff scrub, coastal prairie, North Coast coniferous forest 50-4035 ft (15-1230 m)	Absent	No suitable habitat within ESL.
Small spikerush	*Eleocharis parvula*	--/--/4.3	Marshes and swamps 5-9910 ft (1-3020 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.
Sticky pea	*Lathyrus glandulosus*	--/--/4.3	Cismontane woodland 985-2625 ft (300-800 m)	Absent	No suitable habitat within ESL.
Trailing black currant	*Ribes laxiflorum*	--/--/4.3	North Coast coniferous forest 15-4575 ft (5-1395 m)	Absent	No suitable habitat within ESL.
Western lily	*Lilium occidentale*	FE/SE/1B.1	Bogs and fens, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, North Coast coniferous forest 5-605 ft (2-185 m)	Absent	No suitable habitat within ESL.
Western sand-spurrey	*Spergularia canadensis* var. *occidentalis*	--/--/2B.1	Marshes and swamps 0-10 ft (0-3 m)	Present	Potentially suitable habitat within ESL. Not observed during floristic surveys.
Wolf's evening-primrose	*Oenothera wolfii*	--/--/1B.1	Coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest 10-2625 ft (3-800 m)	Absent	No suitable habitat within ESL.
NON-VASCULAR PLANTS AND FUNGI					
Cylindrical trichodon	*Trichodon cylindricus*	--/--/2B.2	Broadleaf upland forest, meadows and seeps, upper montane coniferous forest 165-6570 ft (50-2002 m)	Absent	No suitable habitat within ESL.

Common Name	*Scientific Name*	Status[1] Federal/ State/ CRPR	Habitat/ Elevational Range (feet)	Habitat[2] Present/ Absent	Rationale
Methuselah's beard lichen	*Usnea longissima*	--/--/4.2	Broadleaf upland forest, North Coast coniferous forest. 165-4790 ft (50-1460 m)	Absent	No suitable habitat within ESL.
Minute pocket moss	*Fissidens pauperculus*	--/--/1B.2	North Coast coniferous forest 10-1024 ft (35-3360 m)	Absent	No suitable habitat within ESL.
Twisted horsehair lichen	*Sulcaria spiralifera*	--/--/1B.2	Coastal dunes, North Coast coniferous forest 0-295 ft (0-90 m)	Absent	No suitable habitat within ESL.

[1]**Status:**

Federal: FE = Endangered

State: SE = State Endangered; SCE = State Candidate Endangered

California Rare Plant Rank (CRPR): 1B = rare, threatened, or endangered in California and elsewhere; 2B = rare, threatened, or endangered in California but more common elsewhere; 3 = more information is needed (Review List); 4 = limited distribution (Watch List)

CRPR Threat Rank: 0.1 = seriously endangered in California, 0.2 = fairly endangered in California, 0.3 = not very endangered in California.

[2] **Habitat:** Absent: no habitat present and no further work needed.
Present: habitat is or may be present. The species may be present.

Special Status Animal Species

For the purposes of this evaluation, "special status animal species" are those species that are legally protected or prioritized under the regulations addressed in Section 2.3. Special status animal species reviewed in this NES includes species, subspecies, Distinct Population Segments (DPS), or Evolutionarily Significant Units (ESU) where at least one of the following conditions applies:

- Listed or proposed for listing under state and/or federal endangered species acts
- Taxa considered by CDFW to be a Species of Special Concern (SSC)
- Taxa which meet the criteria for listing, even if not currently included on any list, as described in Section 15380 of CEQA Guidelines
- Taxa that are biologically rare, very restricted in distribution, or declining throughout their range, but not currently threatened with extirpation
- Population(s) in California that may be peripheral to the major portion of a taxon's range but are threatened with extirpation in California
- Taxa closely associated with a habitat that is declining in California at a significant rate (e.g., wetlands, riparian, vernal pools, old-growth forests, desert aquatic systems, native grasslands, valley shrubland habitats, etc.)
- Taxa designated as a special status, sensitive, or declining species by other state or federal agencies, or a non-governmental organization, and determined by the CNDDB to be rare, restricted, declining, or threatened across their range in California

Based on the queries made to USFWS, NMFS, and CDFW–CNDDB databases, 18 special status animals and/or suitable habitat is present within the BSA (Table 5). Impacts from the project to special status animals that could be present within the project area, based on suitable habitat, elevation and/or geographical range, are evaluated in Chapter 4. Those species where the project either lacks suitable habitat or is outside the elevation and/or geographical range of the species are not discussed in Chapter 4.

Table 5. Special Status Animal Species and Critical Habitat Potentially Occurring or Known to Occur within the Project Area

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
AMPHIBIANS					
Foothill yellow-legged frog–North Coast DPS	*Rana boylii*	--/SSC	Partly shaded, shallow streams and riffles with a rocky substrate.	Absent	No suitable habitat within BSA.
Northern red-legged frog	*Rana aurora*	--/SSC	Humid forests, grasslands, streamsides, usually near dense riparian cover. Generally near permanent water.	Absent	No suitable habitat within BSA.
Pacific tailed frog	*Ascaphus truei*	--/SSC	Montane hardwood-conifer, redwood, Douglas-fir and ponderosa pine habitats in cold perennial montane streams.	Absent	No suitable habitat within BSA.
Southern torrent salamander	*Rhyacotriton variegatus*	--/SSC	Coastal redwood, Douglas-fir, mixed conifer, montane riparian and montane hardwood-conifer habitats. Cold, well-shaded, perennial streams and seepages.	Absent	No suitable habitat within BSA.
REPTILES					
Green sea turtle–East Pacific DPS	*Chelonia mydas*	FT/--	Nearshore ocean waters.	Absent	No suitable habitat within BSA.
Leatherback sea turtle	*Dermochelys coriacea*	FE/--	Pelagic ocean waters.	Absent	No suitable habitat within BSA.
Olive Ridley sea turtle	*Lepidochelys olivacea*	FT/--	Tropical and subtropical oceans, occasional in temperate Pacific waters.	Absent	No suitable habitat within BSA.
Western pond turtle	*Emys marmorata*	--/SSC	Ponds, marshes, rivers, streams. Needs basking sites and sandy banks or grassy open fields near water for egg-laying.	Absent	No suitable habitat within BSA.

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
BIRDS					
American peregrine falcon	*Falco peregrinus anatum*	--/FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	Present	Potential foraging within the BSA. No suitable nesting habitat within BSA.
Bald eagle	*Haliaeetus leucocephalus*	--/SE, FP	Occurs along ocean shores, lake margins, and rivers for nesting and wintering. Nests in large trees with open branches.	Absent	No suitable habitat within BSA.
Bank swallow	*Riparia riparia*	--/ST	Riparian scrub and woodland, nests in vertical banks/cliffs with fine soils near streams, rivers, lakes, ocean.	Absent	No suitable habitat within BSA.
Brant	*Branta bernicla*	--/SSC	Coastal bays with eelgrass during spring migration. Humboldt Bay an important feeding and staging area.	Present	Potential foraging habitat in eelgrass within BSA/ESL.
California brown pelican	*Pelecanus occidentalis californicus*	--/FP	Nests on coastal islands lacking ground predators; roosts on piers, buoys, and structures near water and the coast.	Present	Potential foraging within the BSA. No suitable nesting habitat within BSA.
California Ridgway's rail	*Rallus obsoletus obsoletus*	FE/SE, FP	Salt water and brackish marshes traversed by tidal sloughs. Associated with pickleweed.	Absent	Outside known range of species.
Marbled murrelet	*Brachyramphus marmoratus*	FT/SE	Nests in coastal old-growth coniferous forests from Santa Cruz north. Forages in nearshore waters and known to occur in Humboldt Bay.	Present	Potential foraging within the BSA. No suitable nesting habitat within BSA.
Mountain plover	*Charadrius montanus*	--/SSC	Chenopod scrub, valley and foothill grassland.	Absent	No suitable habitat within BSA.
Northern harrier	*Circus hudsonius*	--/SSC	Nests on the ground among vegetation such as grasses or cattails; forages in grasslands, agricultural fields, and marshes.	Present	Potential foraging within the BSA. No suitable nesting habitat within BSA.

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
Northern spotted owl	*Strix occidentalis caurina*	FT/ST	Old-growth/mature forests. Multistory canopy with big trees, many trees with cavities or broken tops, woody debris and space under canopy.	Absent	No suitable habitat within BSA.
Short-tailed albatross	*Phoebastria albatrus*	FE/--	Open ocean and nests on islands in the Pacific Ocean. Only occasionally seen offshore of California.	Absent	No suitable habitat within BSA.
Western snowy plover	*Charadrius nivosus nivosus*	FT/SSC	Nests above high tide on beaches, sand spits, dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries.	Absent	No suitable habitat within BSA.
White-tailed kite	*Elanus leucurus*	--/FP	Forages in grasslands, meadows, or marshes. Nests in woodlands and mature riparian habitats.	Present	Potential foraging within the BSA. No suitable nesting habitat within BSA.
Yellow rail	*Coturnicops noveboracensis*	--/SSC	Typically higher and drier margins of freshwater and brackish marshes, usually dominated by sedges and grasses. Also in swampy meadows, sedge meadows dominated by *Carex lasiocarpa*, and occasionally wet, cut-over hay fields.	Absent	No suitable habitat within BSA.
Yellow-billed cuckoo–Western U.S. DPS	*Coccyzus americanus*	FT/SE	Nests in riparian forests along broad, lower flood-bottoms of larger river systems.	Absent	No suitable habitat within BSA.
FISH					
Chinook salmon–California Coastal ESU	*Oncorhynchus tshawytscha*	FT/--	Coastal streams from Redwood Creek in Humboldt County to the Russian River in Sonoma County. Cold, clean water and gravel for spawning and rearing, with cover for refuge.	Present, CH, EFH Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
Coho salmon–Southern Oregon/Northern California Coast ESU	*Oncorhynchus kisutch*	FT/ST	Streams, rivers between Cape Blanco, Oregon, and Punta Gorda, Humboldt County. Juveniles rear in estuaries, including Humboldt Bay.	Present, CH and EFH Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Coast cutthroat trout	*Oncorhynchus clarkii clarkii*	--/SSC	Coastal streams, some migrate to nearshore ocean waters and mouths of larger rivers. In freshwater, small, low gradient streams and estuaries.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Longfin smelt	*Spirinchus thaleichthys*	--/ST	Oceans, bays, estuaries, and rivers. Spawns in freshwater with gravel or sandy substrate, rocks and aquatic plants.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
North American Green sturgeon–Southern DPS	*Acipenser medirostris*	FT/--	Pacific coastal waters, bays, and estuaries. Spawns in large coastal streams and rivers.	Present CH Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Pacific eulachon–Southern DPS	*Thaleichthys pacificus*	FT/--	Nearshore ocean waters. Spawns in lower reaches of coastal rivers with moderate water velocities and substrate of pea-sized gravel, sand, and woody debris.	Present	Suitable habitat within ESL/BSA.
Pacific lamprey	*Entosphenus tridentatus*	--/SSC	Pacific coast streams north of San Luis Obispo County. Spawns on clean gravel in swift, clear, cold water.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Steelhead–Northern California DPS	*Oncorhynchus mykiss irideus*	FT/--	Ocean waters and coastal basins from Redwood Creek south to the Gualala River.	Present CH Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Steelhead–Northern California summer run	*Oncorhynchus mykiss irideus*	--/SCE	Ocean waters and Redwood Creek, Mad River, Eel River and Mattole River basins.	Absent	Outside of the known distribution.

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
Tidewater goby	*Eucyclogobius newberryi*	FE/--	Coastal lagoons, estuaries, and marshes.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Western brook lamprey	*Lampetra richardsoni*	--/SSC	Coastal streams from southeastern Alaska to California. Spawns on clean gravel in clear, cold water.	Absent	No suitable habitat within BSA.
MAMMALS					
Fisher	*Pekania pennanti*	--/SSC	Mature coniferous forests and deciduous-riparian areas with high canopy closure. Cavities, snags, logs and rocky areas used for cover and denning.	Absent	No suitable habitat within BSA.
Pacific (Humboldt) marten–Coastal DPS	*Martes caurina humboldtensis*	FT/SE	Del Norte, western Siskiyou, and extreme northern Humboldt counties; in late-successional coniferous forests with low overhead cover.	Absent	No suitable habitat within BSA.
Sonoma tree vole	*Arborimus pomo*	--/SSC	Coastal fog belt from Oregon border to Sonoma County in montane hardwood-conifer forests. Eats Douglas-fir needles.	Absent	No suitable habitat within BSA.
Townsend's big-eared bat	*Corynorhinus townsendii*	--/SSC	Variety of habitats, most common in mesic sites. Roosts in the open, hanging from walls and ceilings.	Absent	No suitable habitat within BSA.
White-footed vole	*Arborimus albipes*	--/SSC	Mature coastal forests in Humboldt and Del Norte counties, near small, clear streams with dense alder and shrubs.	Absent	No suitable habitat within BSA.
MARINE MAMMALS					
Blue whale	*Balaenoptera musculus*	FE/--	Offshore, continental break and shelf, nearshore occasionally.	Absent	No suitable habitat within BSA.
California sea lion	*Zalophus californianus*	MMPA/--	Coastal waters and bays. Breeds in colonies off southern California and Baja Mexico. Non-breeding adults occur in Humboldt Bay.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
Fin whale	*Balaenoptera physalus*	FE/--	Offshore, continental break and shelf, nearshore occasionally.	Absent	No suitable habitat within BSA.
Harbor porpoise	*Phocoena phocoena*	MMPA/--	Coastal waters and bays.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Harbor seal	*Phoca vitulina*	MMPA/--	Nearshore ocean waters, bays, estuaries, river mouths. Haul-outs on tidal rocks, mudflats, sandbars, and sandy beaches.	Present	Suitable habitat within ESL/BSA. Known to occur in Humboldt Bay.
Humpback whale	*Megaptera novaeangliae*	FE/--	Nearshore ocean waters, continental shelf.	Absent	No suitable habitat within BSA.
North Pacific right whale	*Eubalaena japonica*	FE/--	Nearshore and offshore ocean waters.	Absent	No suitable habitat within BSA.
Sei whale	*Balaenoptera borealis*	FE/--	Nearshore and offshore ocean waters.	Absent	No suitable habitat within BSA.
Sperm whale	*Physeter macrocephalus*	FE/--	Shelf, slope, offshore ocean waters.	Absent	No suitable habitat within BSA.
Southern Resident killer whale	*Orcinus orca*	FE/--	Nearshore ocean waters.	Absent	No suitable habitat within BSA.
INVERTEBRATES					
Crotch bumble bee	*Bombus crotchii*	--/SCE	Open grassland and scrub habitats. Typically nests in underground abandoned rodent burrows or cavities.	Absent	No suitable habitat within BSA.

Common Name	*Scientific Name*	Status[1] Federal/ State	General Habitat Description	Habitat[2] Present/ Absent/	Rationale
Monarch butterfly	*Danaus plexippus*	FC/--	Widespread in spring and summer in California. Breeds on milkweed host plants. Overwinters in roosts along coastal northern Mendocino to Baja California, Mexico. Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	Absent	No suitable habitat within BSA.
Western bumble bee	*Bombus occidentalis*	--/SCE	Meadows and grasslands with abundant floral resources. Typically nests in underground abandoned rodent burrows or cavities.	Absent	No suitable habitat within BSA.

[1] **Federal Status**: FE = Endangered; FT = Threatened; FC = Candidate; MMPA = Marine Mammal Protection Act

State Status: SE = Endangered; ST = Threatened; SCT = Candidate Threatened; SCE = Candidate Endangered; SSC = CDFW Species of Special Concern

[2] **Habitat:**
Absent = Absent: no habitat present and no further work needed.
Present = Present: the species is present.
CH = Critical Habitat: the project is located within critical habitat.
EFH = Essential Fish Habitat: the project is located within EFH.

(*Sources: CDFW-CNDDB 2023b; USFWS 2023; NMFS 2023*)

CHAPTER 4. BIOLOGICAL RESOURCES, DISCUSSION OF IMPACTS AND MITIGATION

This section evaluates potential effects of project activities on sensitive biological resources within the Biological Study Area (BSA). Habitats are considered to be of special concern based on (1) federal, state, or local laws regulating their development; (2) limited distributions; and/or (3) the habitat requirements of special status plants or animals occurring on-site.

4.1. Habitats and Natural Communities of Special Concern

The BSA supports natural communities of special concern, including Sensitive Natural Communities (SNCs), Wetlands and Other Waters of the U.S. and State, Environmentally Sensitive Habitat Areas (ESHAs), and eelgrass beds.

4.1.1. Sensitive Natural Communities

Survey Results

Two SNCs were mapped within the BSA; approximately 2,610 acres of the Salal (*Gaultheria shallon*) – Berry (*Rubus ursinus*) Brambles Alliance / Thimbleberry (*Rubus parviflora*) Association (G2 S3) and 1.767 acres (76,971 sq. ft) of the Pickleweed *(Sarcocornia pacifica)* Mats Alliance occur within the BSA (Appendix G). Four communities within the Pickleweed *(Sarcocornia pacifica)* Mats Alliance were detected; however, since all pickleweed mat communities are considered "sensitive" (G4 and S3 designations) they were calculated together for the purpose of this report.

Project Impacts

Temporary impacts of up to approximately 0.11 acre of the Pickleweed Mats Alliance may occur during the geotechnical drilling (Appendix G). Potential temporary impacts to the pickleweed mats include minor compaction or disturbance of the vegetation and soils from access pathways, and operation of the track-mounted drill rig at each of the four boring holes that are within or adjacent to this habitat. No excavation, grubbing, or vegetation removal would occur, except for minor trimming of bushes or limbs. No access roads or platforms would be graded or built, and no gravel or soils would be imported.

The only equipment that would be driven or operated within the pickleweed mats is the 7-foot-wide track-mounted drill rig. Wetland protection mats would be used to protect pickleweed and wetlands. It is anticipated that minor impacts to this sensitive natural community would not be visible by the following year.

Avoidance and Minimization Efforts

Caltrans would implement appropriate standard measures and BMPs to minimize adverse impacts on pickleweed mats, including use of wetland protection mats for driving in pickleweed and wetlands, containment of drilling fluids, and a Spill Prevention Plan (Section 1.2).

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would only result in temporary impacts on SNCs, no cumulative impacts on SNCs are anticipated.

4.1.2. Wetlands and Waters of the U.S. and State

Included in this report are the wetland delineation data necessary to report aquatic resources pertinent to the U.S. Army Corps of Engineers (USACE), North Coast Regional Water Quality Control Board (NCRWQCB), California Department of Fish and Wildlife (CDFW), and the California Coastal Commission (CCC).

The USACE regulates Waters of the U.S. under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbor Act. The RWQCB regulates discharges of fill and dredged material into Waters of the State under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act. CDFW requires a 1602 Lake or Streambed Alteration Agreement (LSAA) for any activity that would substantially modify a river, stream, or lake. The BSA is within the Coastal Zone and impacts on sensitive habitats such as wetlands and waters are also regulated by the CCC.

Survey Results

Caltrans conducted a wetland delineation within the BSA. The wetland boundaries were evaluated using the USACE (three-parameter) method and, because the site is within the Coastal Zone, the CCC (one- and two-parameter) methods. The wetland determination was made with an emphasis on redoximorphic soil features and presence of hydrophytic vegetation.

Wetland soils in the BSA consisted of hydric soil parameters for depleted matrix or redox dark surface indicators. In general, upland soils had too high of a chroma rating to meet wetland indicators. Where lower chromas were present, they did not have redoximorphic features present, or all upland plots exhibited predominance of facultative-upland or drier vegetation within the Coastal Zone.

A total of 3.085 acres of aquatic resources were mapped within the BSA, comprising 1.960 acres of potential wetlands and 1.125 acres of other Waters of the U.S. and States (Table 6 and Appendix H). No CCC one- or two-parameter wetlands were detected.

Table 6. Potential Jurisdictional Wetlands and Waters of the U.S. and State in the Biological Study Area

Feature Type	Cowardin	Area
WETLANDS		
Palustrine Emergent Wetland	PEM1C	0.180 acre
Estuarine Emergent Wetland	E2EM1N	1.780 acre
OTHER WATERS OF THE U.S. AND STATE		
Estuarine Channel	E1UBL	0.043 acre
Estuarine and Marine Deepwater	E12B2L E2AB1N E2US2N	1.081 acre
Total Wetlands		**1.960 acres**
Total Other Waters of the U.S. and State		**1.124 acres**
Total Coastal Regulated Features		**3.084 acres**

Project Impacts

Temporary impacts of up to approximately 3,600 square feet (0.083 acre) of wetlands would occur during the geotechnical drilling from the operation of the track-mounted drill rig at each of the four boring holes (30 ft x 30 ft = 900 sq ft per boring hole) that are within or adjacent to wetlands (Table 7 and Appendix H). Potential temporary impacts include minor compaction or disturbance of wetland vegetation and soils. No excavation, grubbing, or vegetation removal would occur, except for minor trimming of bushes or limbs. No access roads or platforms would be graded or built, no gravel or soils would be imported, and the only equipment that would be driven or operated within the wetlands is the 7-foot-wide track-mounted drill rig. Staging areas and all other vehicles and equipment would be placed on the adjacent highway or shoulders within Caltrans right of way. No temporary impacts to wetlands are anticipated from access pathways (where the track-mounted drill rig is driven to the boring holes) due to the use of wetland protection mats. A minor amount of trimming of bushes or limbs may occur for the access pathways as needed. It is anticipated that minor impacts to wetland vegetation and soils would not be visible by the following year.

Table 7. Potential Impacts to Jurisdictional Wetlands and Waters of the U.S. and State

Aquatic Resource Type	Area of Temporary Impacts – Drilling Disturbance Area	Area of Permanent Impacts – Fill of Boring Holes
WETLANDS		
Palustrine Emergent Wetland	400 sq ft	0
Estuarine Emergent Wetland	3,200 sq ft	0.54 sq ft
OTHER WATERS OF THE U.S. AND STATE		
Estuarine and Marine Deepwater	0	1.36 sq ft
Total Impacts on Wetlands	**3,600 sq ft**	**0.54 sq ft**
Total Impacts on Other Waters of the U.S. and State	**0**	**1.36 sq ft**
Total Impacts on Coastal Regulated Features	**3,600 sq ft (0.083 acre)**	**1.90 sq ft**

Permanent impacts of fill to approximately 1.90 square feet in wetlands and other waters would occur from backfilling 14, 5-inch-diameter boring holes upon completion of geotechnical drilling (Table 7 and Appendix H). Four of these boring holes are in wetlands and would be filled with cement grout, with the top 5 feet filled with native soils. Ten of the boring holes would be in the estuarine/marine deepwater channel (drilled though the bridge deck) and would be backfilled with concrete, with the top 20 feet of the hole filled with a non-toxic bentonite clay mixture.

Avoidance and Minimization Efforts

Caltrans would implement appropriate standard measures and BMPs to minimize adverse impacts on aquatic habitats, use of wetland protections mats for driving in wetlands, containment of drilling fluids, and a Spill Prevention Plan (Section 1.2).

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

As impacts are minor or temporary, no cumulative impacts on Wetlands or Other Waters of the U.S. and State are anticipated.

4.1.3. Environmentally Sensitive Habitat Areas

Environmentally Sensitive Habitat Areas (ESHAs) are defined by California Coastal Act (CCA) Section 30107.5, as "…any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments." Because the project is within the Coastal Zone, ESHAs are to be considered.

Survey Results

The following areas within the BSA meet the CCA definition of ESHAs:

- SNC Pickleweed *(Sarcocornia pacifica)* Mats Alliance
- SNC Salal (*Gaultheria shallon*) – Berry (*Rubus ursinus*) Brambles Alliance / Thimbleberry (*Rubus parviflora*) Association
- Wetlands and aquatic habitats

Surveys conducted for these ESHAs are described in Sections 4.1.1 and 4.1.2.

Project Impacts

Temporary impacts to a SNC, wetlands, and aquatic habitats considered to be ESHAs may occur during the geotechnical drilling (Table 8). Potential temporary impacts to the SNC pickleweed mats and wetlands include minor compaction or disturbance of the vegetation and soils from the operation of the track-mounted drill rig at each of the four boring holes that are within or adjacent to these habitats. It is anticipated minor impacts to this sensitive natural community and wetland vegetation and soils would not be visible by the following year.

Table 8. Potential Impacts to ESHAs

ESHA Criteria	ESHA Type	Area of Temporary Impacts	Area of Permanent Impacts
Sensitive Natural Community, S3 Ranking	Pickleweed *(Sarcocornia pacifica)* Mats Alliance	0.11 acre	0
Wetlands	Palustrine Emergent Wetland, Estuarine Emergent Wetland	0.084 acre (3,600 sq ft)	0.54 sq ft
Aquatic Habitat	Estuarine and Marine Deepwater	0	1.36 sq ft

Permanent impacts of fill to approximately 0.54 square feet in wetlands and 1.36 square feet in other aquatic habitats would occur from backfilling 14, 5-inch-diameter boring holes upon completion of geotechnical drilling (Table 8). More details on impacts to these habitat types are provided in Sections 4.1.1 and 4.1.2.

Avoidance and Minimization Efforts

Caltrans would implement appropriate standard measures and BMPs to minimize adverse impacts on ESHAs, including use of track-mounted drill rig and wetland protection mats for work in pickleweed and wetlands, containment of drilling fluids, and a Spill Prevention Plan (Section 1.2).

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

As impacts are minor and temporary, no cumulative impacts on ESHAs are anticipated.

4.1.4. Eelgrass

Eelgrass is widely considered one of the most ecologically valuable and productive habitats in the coastal environment because they provide cover from predators for fish and invertebrates, rearing habitat for juvenile fish and invertebrates, and add to local habitat complexity (Schlosser and Eicher 2010). National Marine Fisheries Service (NMFS) recognizes eelgrass beds as being a Habitat Area of Particular Concern (HAPC) and for providing Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act of 1997 (as amended). NMFS' policy is to recommend no net loss of eelgrass function in California. Eelgrass, as a form of submerged aquatic vegetation, is protected by the Clean Water Act. Under the California Environmental Quality Act (CEQA), CDFW recommends avoidance of eelgrass habitat where possible and may approve compensatory mitigation for loss of eelgrass function associated with projects. Under the CCA, the CCC is required to consult with CDFW to evaluate projects where mitigation is required.

Survey Results

Preliminary eelgrass surveys were conducted in 2021 within the ESL for the Eureka Slough Bridges Replacement Project to allow Caltrans to pursue an early mitigation strategy (Caltrans 2022). Eelgrass is present within the ESL (Appendix I).

Project Impacts

Impacts on eelgrass or eelgrass habitat are not anticipated. Eelgrass would not be directly impacted by any geotechnical drilling because eelgrass does not extend under the bridge where geotechnical drilling would occur.

Potential water quality impacts as a result of geotechnical drilling which could impact eelgrass include accidental spills or leaks from drilling equipment and increased suspended sediment and turbidity from accidental seepage of drilling fluid into the channel. With implementation of the standard measures and BMPs to protect water quality, as identified in Section 1.2., impacts are not anticipated.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality, as identified in Section 1.2., would be implemented to avoid and minimize impacts on eelgrass and eelgrass habitat.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given the project would avoid impacts on eelgrass, no cumulative impacts on eelgrass are anticipated.

4.2. Discussion of Special Status Plant Species

Special status plant species that could be impacted by the project, potential impacts, and avoidance and minimization measures are discussed below.

4.2.1. Humboldt Bay Owl's Clover and Point Reyes Bird's-Beak

Humboldt Bay owl's-clover (*Castilleja ambigua* var. *humboldtiensis*) has a California Rare Plant Rank (CRPR) of 1B.2. It is an annual herb in the parasitic broomrape family (Orobanchaceae). Endemic to California, it is only known to occur in coastal salt marshes around Humboldt Bay, and in Mendocino and Marin counties. This plant is hemiparasitic, sometimes obtaining moisture and nutrients from the roots of its host plants, which are usually perennials. It grows mainly in higher areas of salt marshes but also in coastal grasslands. Leaves are lanceolate to oblong in shape, either simple or lobed, and up to nearly 2 inches long. The inflorescence is a dense, cylindrical spike of flowers and bracts up to 4.5 inches long. The flowers are bright pink (maturing to dull purplish in some populations), with small purple markings near the tip of the pouch. The flowering period is from May to August. Threats to this species include diking and draining of marshes for development, off-road vehicle use, foot traffic associated with recreational uses, and road/trail construction and maintenance. Invasion of non-native plants, particularly that of dense-flowered cordgrass (*Spartina densiflora*), is also a threat to this species.

Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*) has a CRPR of 1B.2. It is an annual hemiparasitic herb, and member of the broomrape family (Orobanchaceae). It occurs along the coast from Tillamook County, Oregon, south to Santa Clara County, California. It is a branched annual herb that bears spikes of bee-pollinated flowers. The flowering period is June to October. It is distinguished by the oblong shape of its leaves and bracts, and by white and purple flowers. It grows in the higher reaches of coastal salt marshes to intertidal and brackish areas influenced by freshwater input. Locally, Point Reyes bird's-beak habitat overlaps with that for Humboldt Bay owl's clover, and thus is vulnerable to many of the same threats.

Survey Results

Humboldt Bay owl's-clover and Point Reyes bird's-beak were detected in several areas within the ESL during botanical surveys (Appendix G).

Project Impacts

Impacts on Humboldt Bay owl's clover and Point Reyes bird's-beak are not anticipated. Geophysical surveys, consisting of foot traffic to lay cables, geophones, and strike plates, would occur in some areas where the plants are known to occur. However, no drilling or heavy equipment would occur within these areas.

Avoidance and Minimization Efforts

Prior to the start of work, Humboldt Bay owl's clover and Point Reyes bird's-beak occurrences would be flagged within the ESL and no drilling or heavy equipment would occur in these areas. Geophysical surveys, consisting of foot traffic to lay cables, geophones, and strike plates, would be allowed in or adjacent to occurrences.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given the project would avoid impacts to Humboldt Bay owl's clover and Point Reyes bird's-beak, no cumulative impacts on these plant species are anticipated.

4.3. Discussion of Special Status Animal Species

Special status animal species that could be impacted by the project, potential impacts, and avoidance and minimization measures is discussed below.

BIRDS

4.3.1. Raptors

The American peregrine falcon (*Falco peregrinus*) is a state fully protected species. It is a wide-ranging raptor that occurs in a large variety of habitats. They feed mainly on birds (doves, shorebirds, pigeons, ducks), as well as some mammals, such as bats, rabbits, and rodents, and occasionally insects, reptiles, and fish. Although peregrine falcons often nest on cliff faces, they also nest on a wide variety of other structures, including buildings, bridges, electrical transmission structures, and occasionally the abandoned nests of large raptors or ravens (White et al. 2002).

The northern harrier (*Circus hudsonius*) is a Species of Special Concern (SSC). They are widespread throughout California and occur in a wide variety of open habitats such as marshes, meadows, grasslands, and agricultural fields. They nest on the ground in tall vegetation.

The white-tailed kite (*Elanus leucurus*) is a state fully protected species. White-tailed kites are common throughout California and occur in a variety of open habitats including grasslands, wetlands, and agricultural fields, with trees for nesting and roosting. They are often seen hovering over fields and then dropping feet-first to capture prey. They are generally resident and non-migratory.

Survey Results

No bird surveys were conducted for the project. The BSA may contain suitable foraging habitat for American peregrine falcon, northern harrier, and white-tailed kite. Although all three species are known to nest in the region, the BSA does not contain any suitable nesting habitat for these species.

Project Impacts

Impacts to American peregrine falcon, northern harrier, and white-tailed kite are not anticipated given the temporary nature of the disturbance and because the BSA does not contain suitable nesting habitat for these species. The project would not alter suitable foraging habitat for these species.

Avoidance and Minimization Efforts

Standard protection measures, as identified in Section 1.2, would be implemented to avoid and minimize impacts to nesting migratory birds.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given the project would not impact American peregrine falcon, northern harrier, and white-tailed kite or potentially suitable foraging habitat, cumulative impacts are not anticipated.

4.3.2. Brant

Brant (*Branta bernicla*) is a SSC. They nest in the Arctic, Alaska, and Russia, and winter along the eastern Pacific coast from Alaska to Mexico. During the non-breeding season, they congregate in bays and estuaries, and eelgrass is their principal food source. Humboldt Bay eelgrass beds support the majority of brant in California during spring staging prior to northward migration (Moore et al., 2004).

Survey Results

No bird surveys were conducted for the project. Brant are well-documented using eelgrass beds in Humboldt Bay during spring staging (Moore et al., 2004). They may be present in the eelgrass beds within the BSA from late October to late May, peaking in March and April (Davis and Deuel 2008).

Project Impacts

Impacts on brant are not anticipated given that geotechnical drilling into the channel near the eelgrass beds would occur between June 15 and October 15, when brant are not expected to occur in the region. Eelgrass beds would also be avoided during geotechnical drilling.

Avoidance and Minimization Efforts

No avoidance or minimization measures are proposed.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given the project would not impact brant, no cumulative impacts are anticipated.

4.3.3. California Brown Pelican

The California brown pelican (*Pelecanus occidentalis californicus*) is a state fully protected subspecies. The brown pelican (*Pelecanus occidentalis*) was previously federally listed as endangered, and the California subspecies was state listed as endangered; however both were delisted in 2009. The California brown pelican nests in southern California and Mexico but ranges widely along the U.S. west coast as far north as British Columbia, Canada. They plunge-dive to capture and feed on small schooling fishes in estuaries, bays, and ocean waters. Pelicans roost in communal roosts on sandbars, pilings, jetties, and offshore rocks.

Survey Results

No bird surveys were conducted for the project. In Humboldt Bay, California brown pelican have been reported to roost on Sand Island, oyster racks, jetties, mudflats, and structures such as docks and piers, in summer and autumn (Jaques et al., 2008). They could occur as individuals or in small numbers on occasion within the ESL and BSA; however, these areas have not been reported as known roosting areas, therefore it is unlikely pelicans would be present in large numbers. California brown pelicans do not nest within Humboldt Bay.

Project Impacts

The project is not expected to impact California brown pelicans because they are unlikely to be present within the BSA. If they are present, they would be roosting in small numbers and would likely move away from project disturbance.

Avoidance and Minimization Measures

No avoidance measures are proposed.

Compensatory Mitigation

No compensatory mitigation is proposed because no effects were identified that require mitigation.

Cumulative Impacts

Given the project would not impact California brown pelican, no cumulative impacts are anticipated.

4.3.4. Marbled Murrelet

Marbled murrelet (*Brachyramphus marmoratus*) is federally threatened and state endangered. The marbled murrelet is a small seabird that occurs along the Pacific coast of North America from Alaska south to central California. Populations have declined primarily due to loss and fragmentation of nesting habitat from harvest of old-growth coniferous forests. They forage primarily in nearshore marine waters (i.e., within a few miles of shore) in groups of two or more, and also forage in protected bays and coves (Ralph et al., 1995). They fly inland to nest, laying a single egg on a large moss-covered branch high in an old-growth coniferous tree. In California, nests are initiated from mid-March to mid-August, and chicks fledge by mid-September (Hamer and Nelson 1995). During the non-breeding season, marbled murrelets spend most of their time at sea but may fly inland to visit nesting areas during early morning hours, presumably to locate and establish claims on nest sites and to establish pair-bonds for future nesting (Naslund 1993; Hébert and Golightly 2006).

Critical habitat for the marbled murrelet has been designated but does not include the ESL.

Survey Results

No surveys were conducted for marbled murrelets. Marbled murrelets are known to occur in small numbers in Humboldt Bay, particularly in late summer and fall, and have primarily been reported in the deeper channels closer to the entrance portion of the bay (eBird 2021). The nearest record to the ESL was along the Humboldt Bay waterfront near Halvorsen Park, approximately 1.2 miles away (eBird 2021). It is possible, but unlikely they would occur in the BSA/action area.

Project Impacts

Noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, and from three seismic refraction surveys in salt marsh, are potential stressors that could affect marbled murrelet in the BSA/action area. The noise levels of geotechnical drilling equipment are included in Section 1.1, Table 1. Exposure to elevated sound pressure levels from impact-hammer pile driving can cause behavioral effects, auditory injury, physical injury, and mortality to marbled murrelets (Teachout 2012). However, there is currently no established threshold for estimating adverse effects from non-impact vibratory sources because these sources are not thought to cause harm (Teachout 2012). In addition, marbled murrelets are unlikely to occur within the BSA/action area.

Under FESA, the project would have ***no effect*** on marbled murrelet.

Under CESA, the project would not result in "take" of marbled murrelets.

Avoidance and Minimization Measures

No avoidance measures are proposed.

Compensatory Mitigation

No compensatory mitigation is proposed because no effects were identified that require mitigation.

Cumulative Impacts

Given the project would not impact marbled murrelet, no cumulative impacts are anticipated.

FISH

4.3.5. Chinook Salmon–California Coastal ESU and Critical Habitat

The Chinook salmon (*Oncorhynchus tshawytscha*)–California Coastal (CC) ESU is listed as federally threatened and includes naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River to the Russian River (70 Federal Register [FR] 37160). Critical habitat was designated in 2005 and includes the same stream reaches identified by the final listing rule (70 FR 52629). The BSA/action area is within critical habitat.

The CC Chinook salmon is a fall-run, ocean-type anadromous fish. Adults enter fresh water between August and January and typically spawn in lowland reaches of big rivers and tributaries within a few days or weeks after arrival (Healey 1991). Spawning generally occurs in swift, relatively shallow riffles or along the edges of fast runs. Preferred spawning substrate is clean, loose gravel. They rear in fresh water, lagoons, estuaries, and bays for one to three months, usually departing for the ocean in summer (Moyle et al., 2008). Optimal water temperatures for juvenile rearing are between 12° and 17° C (Richter and Kolmes 2005).

CC Chinook critical habitat includes sites essential to support one or more life stages of the ESU. These include freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, and estuarine areas for rearing and transitions between freshwater and saltwater. Within these sites, essential physical or biological features include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, space, and safe passage conditions.

Survey Results

Surveys were not conducted for salmonids in the BSA, but there are existing survey data from other sources. Chinook salmon spawn and rear in Freshwater Creek and estuary upstream of the ESL, and adult Chinook pass through Eureka Slough and Humboldt Bay during spawning runs in fall/winter, and smolt ocean migrations in summer (Wallace 2006; Anderson and Ward 2016). Juveniles have been reported to remain in Freshwater Creek and estuary for 1 to 8 weeks (Wallace 2006). Their time in the estuary may be limited by the warming of the water in lower Freshwater Slough (upstream of Eureka Slough), which reached near lethal levels (20° C) by late June and remained there throughout the summer, potentially forcing young of the year Chinook salmon out of the slough and into Humboldt

Bay in mid- to late summer (Wallace 2006). Although water temperatures in Eureka Slough did not reach lethal levels during the study, they exceeded temperatures for optimal growth (12-17° C) conditions for juveniles by mid-August. The quality of rearing habitat for Chinook salmon in much of the action area is likely marginal due to the lack of deep water, natural cover, and structural complexity such as submerged and overhanging large wood, rock and boulders, and overhanging vegetation.

Chinook salmon may currently be uncommon in the watershed. After ceasing augmentation of the population with hatchery-reared Chinook salmon in 2004, adult escapement declined sharply in the subsequent decade, with no returning adults in 2013, and juveniles were irregularly captured in small numbers (e.g., fewer than ten individuals) in Freshwater Creek in weekly seine surveys conducted in April through June 2013, 2014, and 2015 (Anderson and Ward 2016).

Similar to other salmonid species, they have rarely been collected in Humboldt Bay and Eureka Slough during fish surveys conducted using various types of active and passive sampling gear (e.g., Chamberlain and Barnhart, 1993; Pinnix et al., 2004, 2005; Cole 2004), further suggesting they are likely uncommon within the ESL and BSA.

Project Impacts

Potential stressors on CC Chinook salmon during geotechnical exploration include noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, noise disturbance from three seismic refraction surveys in salt marsh, and water quality impacts from geotechnical drilling into the channel. All the other geotechnical exploration activities would occur on uplands or salt marsh where Chinook salmon are not present; these activities are not expected to impair tidal channel conditions or affect Chinook salmon habitat. No equipment or vehicles would be placed or driven into the tidal channel, no access roads would be constructed, and no dewatering or fish relocation would occur. No riparian vegetation would be removed.

Noise disturbance – Noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, and from three seismic refraction surveys in salt marsh, are potential stressors that could affect fish in the action area. The noise disturbance would be temporary; the 10 borings through the bridge deck would occur over a 16-week period between June 15 and October 15 while the three seismic refraction surveys in salt marsh could occur any time of the year but would take no more than 6 days to complete (2 days per seismic line).

Underwater noise can result in injury or behavioral effects to fish if thresholds are exceeded, which are 206 dB (decibels) peak and 187 dB accumulated sound exposure level (SEL) for fish for injury (for fish over 2 grams), and 150 dB for behavioral effects. Based on the analysis described in Section 1.1, the sound levels generated by seismic surveys and geotechnical drilling are expected to remain below these thresholds. Therefore, potential effects of geotechnical drilling and seismic refraction noise on CC Chinook salmon are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance.

Water quality impacts – Potential water quality impacts to CC Chinook salmon habitat include accidental spills or leaks from drilling equipment and increased suspended sediment and turbidity from accidental seepage of drilling fluid into the channel. Drilling fluid is non-toxic and comprises water thickened with bentonite (clay) or a non-toxic polymer. The potential water quality impacts would be temporary; the 10 borings through the bridge deck would occur over a 16-week period between June 15 and October 15.

Pollutants in the form of gasoline, petroleum, oil, lubricants, or other fluids from an accidental spill or leak from drilling equipment could result in mortality of fish in the immediate vicinity, or result in habitat degradation and reduce growth, reproduction, and movement of individual fish. Accidental spills or leaks from drilling equipment are not anticipated because no equipment would be operated or driven into the tidal channel, and because standard measures and BMPs would be implemented, including a Spill Prevention Plan, as identified in Section 1.2. Therefore, potential exposure to this stressor would be discountable.

Potential effects of increased suspended sediment and turbidity from seepage of drilling fluid on fish include impaired visibility for feeding, reduced feeding rates, and damaged gill tissue causing asphyxiation. Accidental seepage of drilling fluid would occur if the seal that is formed around the casing during drilling is broken, in which case the casing would be pushed downward until the seal is reestablished. Seepage of drilling fluid is highly unlikely to occur, and if it occurred would be seen visually as a plume and would immediately be remedied. Therefore, the potential exposure of Chinook salmon to this stressor is discountable.

Potential water quality impacts as described above could also affect CC Chinook salmon critical habitat, as adequate water quality is one of the essential PCEs in estuarine areas. As described above, the potential exposure to this stressor is discountable with implementation

of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Under FESA, the project ***may affect, but is not likely to adversely affect*** CC Chinook salmon and critical habitat for CC Chinook salmon. Caltrans would initiate informal Section 7 consultation with NMFS to evaluate potential effects on CC Chinook salmon and critical habitat.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on CC Chinook salmon and critical habitat.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect CC Chinook salmon and critical habitat, cumulative impacts are not anticipated.

4.3.6. Coho Salmon–Southern Oregon/Northern California Coast Coho Salmon and Critical Habitat

The coho salmon (*Oncorhynchus kisutch*)–Southern Oregon/Northern California Coast (SONCC) ESU is listed as federally and state threatened. It includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon (Elk River), and Punta Gorda, California (Mattole River), as well as salmon produced by three artificial propagation programs: the Cole Rivers Hatchery (Rogue River) in Oregon, and Trinity River and Iron Gate (Klamath River) hatcheries in California (79 FR 20802). Critical habitat was designated in 1999 and encompasses all accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon (64 FR 24049). The ESL/action area is within critical habitat for SONCC coho salmon.

Coho salmon are anadromous fish. Juveniles rear in their natal stream and/or an estuary for one to two years before emigrating to the ocean where they spend one to two years before returning to their natal stream to spawn (Bell and Duffy 2007; Moyle et al., 2008). In

California, the timing of upstream migration varies among tributaries but generally occurs from September through January with a peak in November and December, and spawning occurs mainly from November to January (Moyle et al., 2008). Eggs incubate in redds (gravel nests) made up of course, loose gravels commonly at the heads of riffles or tails of pools (Moyle et al., 2008). Adults die after spawning. Incubation lasts 8 to 12 weeks, and fry emerge between March and July (Shapovalov and Taft 1954).

Following emergence, young coho salmon rear in low-gradient coastal streams, tributaries to large rivers, brackish-water estuaries, wetlands, lakes, sloughs, side channels, off-channel ponds, beaver ponds, and other slack-waters (Pacific Fishery Management Council 2014). Optimal water temperatures for juvenile rearing are between 12° and 17° C (Richter and Kolmes 2005). They are opportunistic predators that feed primarily on aquatic and terrestrial insects. The migration period of smolts is late April through early July.

SONCC coho salmon critical habitat includes sites essential to support one or more life stages of the ESU. These include freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, and estuarine areas for rearing and transitions between freshwater and saltwater. Within these sites, essential physical or biological features include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, riparian vegetation, food, space, and safe passage conditions.

Survey Results

Surveys were not conducted for salmonids within the BSA; however, there are existing survey data from other sources. Coho salmon spawn and rear in Freshwater Creek and estuary located upstream of the ESL, and they pass through Eureka Slough and Humboldt Bay during spawning runs in fall/winter and smolt ocean migrations in spring (Anderson and Ward 2016; Pinnix et al. 2013; Rebenack et al., 2015; Wallace 2006). The Freshwater Creek stream-estuary ecotone provides high quality rearing habitat for juvenile coho where they reside an average of one to two months, although some individuals rear there for over a year (Wallace et al., 2015). Coho salmon were the most abundant juvenile salmonid captured in Freshwater Creek Slough during surveys (Wallace 2006; Wallace and Allen 2007; Wallace et al., 2018). However, they are likely uncommon within the ESL and BSA, having rarely been collected in Humboldt Bay and Eureka Slough during fish surveys conducted using various types of active and passive sampling gear (e.g., Chamberlain and Barnhart 1993; Pinnix et al., 2004; Pinnix et al. 2005; Cole 2004). Coho salmon smolts tracked with acoustic monitors from Freshwater Creek to Humboldt Bay only briefly passed through Eureka Slough (average <1 day) but spent an average of 10-12 days in the upstream freshwater/estuary

ecotone and an average of 15-22 days in Humboldt Bay (Pinnix et al., 2013). The quality of rearing habitat for Chinook salmon in much of the action area is likely marginal due to the lack of deep water, natural cover, and structural complexity such as submerged and overhanging large wood, rock and boulders, and overhanging vegetation.

Project Impacts

Potential stressors that could affect SONCC coho salmon and critical habitat during geotechnical exploration are the same as those described for CC Chinook salmon and include 1) noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, 2) noise disturbance from 3 seismic refraction surveys in salt marsh, and 3) temporary impairment of water quality from geotechnical drilling into the channel.

The potential effects of geotechnical drilling and seismic refraction noise on SONCC coho salmon are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality impacts on SONCC coho salmon are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Potential water quality impacts as described above could also affect SONCC coho salmon critical habitat, as adequate water quality is one of the essential PCEs in estuarine areas. As described above, the potential exposure to this stressor is discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Under FESA, the project ***may affect, but is not likely to adversely affect*** SONCC coho salmon and SONCC coho salmon critical habitat. Caltrans would initiate informal Section 7 consultation with NMFS to evaluate potential effects on SONCC coho salmon and critical habitat.

Under CESA, the project would not result in "*take*" of SONCC coho salmon.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on SONCC coho salmon and critical habitat.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect SONCC coho salmon and critical habitat, cumulative impacts are not anticipated.

4.3.7. Coastal Cutthroat Trout

Coastal cutthroat trout (*Oncorhynchus clarkii clarkii*) is a SSC. They occur within coastal rivers from southeastern Alaska to the Eel River in northern California. The cutthroat trout exhibits extreme variability in life history. There are sea-run trout that move back and forth between freshwater and ocean waters, freshwater forms that may be migrants within river systems or lake systems, and non-migrants that only move short distances within headwater tributaries (typically upstream of natural barriers) (Johnson et al., 1999). Multiple life-history forms often occur within the same watershed and even the same stream (Johnson et al., 1999).

Cutthroat trout first spawn at age 2 to 4 years and are iteroparous, meaning they do not die after spawning and can return to spawn in successive years. They typically migrate up spawning streams following the first substantial rainfall beginning in fall, spawn from December through June, with peak spawning in December in larger streams and January to February in smaller streams (Johnson et al., 1999). Eggs begin to hatch within 6 to 7 weeks of spawning; fry emerge between March and June, with peak emergence in mid-April. Juveniles remain in the upper watershed for the first year, then may disperse more widely throughout the watershed. Individuals can move in and out of estuaries, freshwater, and river plumes in the ocean. Preferred habitats include small low-gradient coastal streams, estuaries, lagoons, headwater streams, and require cool, clean water with ample cover and deep pools in summer (Johnson et al., 1999).

Survey Results

Surveys were not conducted for salmonids within the BSA, however there is existing survey data from other sources. Freshwater Creek contains spawning and rearing habitat for cutthroat trout and they are known to rear for months to years in the stream-estuary ecotone (Anderson and Ward 2016; Allen et al., 2016; Wallace et al., 2018). The sea-run form may pass through Eureka Slough and Humboldt Bay during spawning migrations in winter/fall

and smolt ocean migrations in spring. However, they are likely uncommon within the ESL and BSA, having rarely been collected in Humboldt Bay and Eureka Slough during fish surveys conducted using various types of active and passive sampling gear (e.g., Chamberlain and Barnhart 1993; Pinnix et al., 2004; Pinnix et al. 2005; Cole 2004).

Project Impacts

Potential stressors that could affect Coastal cutthroat trout during geotechnical exploration are the same as those described for Chinook salmon and include 1) noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, 2) noise disturbance from three seismic refraction surveys in salt marsh, and 3) temporary impairment of water quality from geotechnical drilling into the channel.

The potential effects of geotechnical drilling and seismic refraction noise on Coastal cutthroat trout are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality impacts on Coastal cutthroat trout are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on Coastal cutthroat trout.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect Coastal cutthroat trout, cumulative impacts are not anticipated.

4.3.8. Longfin Smelt

Longfin smelt (*Spirinchus thaleichthys*) is listed as threatened by the state of California. Longfin smelt are a small, short-lived (2 years) pelagic fish that occurs in estuaries and nearshore ocean waters along the Pacific coast from San Francisco Bay to Alaska. They

inhabit the middle or deeper areas of the water column and move up towards surface waters at night. They are known to occur in a wide variety of estuarine habitats and in a range of flow regimes. They spawn in fresh or slightly brackish water where they deposit their eggs on coarse gravel or sandy substrates. Most spawning occurs between January and March. Larvae disperse widely through the estuary. They mature at the end of their second year and migrate to spawn, after which they usually die.

Survey Results

No surveys were conducted for longfin smelt or other fishes within the project BSA. Longfin smelt have been captured throughout Humboldt Bay, including Eureka Slough, Freshwater Slough, and upstream in Freshwater Creek (Garwood 2017). Spawning has been reported in Freshwater Creek and other tributaries to Humboldt Bay. Based on this information, longfin smelt adults, juveniles, and larvae would likely occur within the channel areas of the BSA and ESL year-round. Spawning habitat does not likely occur within the BSA.

Project Impacts

Potential stressors that could affect longfin smelt during geotechnical exploration are the same as those described for Chinook salmon and include 1) noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, 2) noise disturbance from three seismic refraction surveys in salt marsh, and 3) temporary impairment of water quality from geotechnical drilling into the channel.

The potential effects of geotechnical drilling and seismic refraction noise on longfin smelt are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality impacts on longfin smelt are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Under CESA, the project would have no "*take*" of longfin smelt.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on longfin smelt.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect longfin smelt, cumulative impacts are not anticipated.

4.3.9. North American Green Sturgeon–Southern DPS and Critical Habitat

The Southern DPS of the North American green sturgeon (*Acipenser medirostris*) is listed as federally threatened and only spawns in the Sacramento River, although migrating adults are known to occur in Humboldt Bay

Green sturgeon range in ocean waters from Ensenada, Mexico to the Bering Sea, and are common in coastal waters from San Francisco Bay to Canada (Lindley et al., 2008). They make long migrations along the Pacific coast, generally to the north in the fall and to the south in spring (Lindley et al., 2008). They congregate in coastal bays and estuaries of Washington, Oregon, and California (including Humboldt Bay) in summer and fall, and along the coast of British Columbia, Canada in winter and spring (Lindley et al., 2008; Lindley et al., 2011). Green sturgeon are benthic feeders and feed on invertebrates and fish in intertidal mudflats and deeper channels, moving on and off mudflats with tidal fluctuations and frequenting shallow areas less than 33 feet deep (Moyle et al., 1992; Kelly et al., 2007; Moser and Lindley 2007).

Critical habitat for the North American green sturgeon–Southern DPS includes Humboldt Bay and the ESL. Critical habitat is designated for freshwater riverine systems, estuarine areas, and nearshore marine waters. The estuarine features essential to the conservation of North American green sturgeon–Southern DPS include abundant food resources, suitable water flows, suitable water quality, safe migratory corridors, a diversity of water depths, and suitable sediment quality.

Survey Results

No surveys were conducted for green sturgeon or other fishes in the BSA/action area for the project. In one study of 355 adult green sturgeon tagged with acoustic transmitters in rivers along the Pacific coast, a few individuals were detected in Humboldt Bay in summer and fall (June–October) (Lindley et al., 2011). They were detected in the deeper channels of North

Bay, however acoustic receivers in Eureka Slough and Freshwater Slough to the west and east of the bridge detected no sturgeon (W. Pinnix, USFWS, pers. comm. 11/21/22). Based on this information, it is possible that individual green sturgeon could occasionally occur and forage over the intertidal mudflats and deeper channel areas of the BSA/action area in summer and fall; however, their presence is unlikely.

Project Impacts

Potential stressors that could affect North American green sturgeon–Southern DPS and critical habitat during geotechnical exploration are the same as those described for Chinook salmon and include 1) noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, 2) noise disturbance from 3 seismic refraction surveys in salt marsh, and 3) temporary impairment of water quality from geotechnical drilling into the channel.

The potential effects of geotechnical drilling and seismic refraction noise on green sturgeon are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality impacts on green sturgeon are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Potential water quality impacts as described above could also affect North American green sturgeon–Southern DPS critical habitat. As described above, the potential exposure to this stressor is discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Under FESA, the project ***may affect, but is not likely to adversely affect***, North American green sturgeon–Southern DPS and its critical habitat. Caltrans would initiate informal Section 7 consultation with NMFS to evaluate potential effects on North American green sturgeon–Southern DPS and its critical habitat.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on North American green sturgeon–Southern DPS and its critical habitat.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect North American green sturgeon–Southern DPS or critical habitat, cumulative impacts are not anticipated.

4.3.10. Pacific Eulachon–Southern DPS

The Southern DPS of Pacific eulachon (*Thaleichthys pacificus*), which consists of populations in California, Oregon, and Washington, is federally listed as threatened. It is a small, anadromous fish that ranges in the eastern Pacific Ocean from the Bering Sea, Alaska, to Humboldt Bay, California. The southernmost known spawning run is in Mad River just north of Humboldt Bay, with the Klamath River the main spawning river in California. However, there is evidence of a few individuals spawning in Humboldt Bay tributaries from the 1970s (Jennings 1996).

Pacific eulachon spend the majority of their lives in nearshore ocean waters, returning to larger rivers during spring runoff to spawn. Larvae generally drift downstream and rear in estuaries for weeks to months, then juveniles move to nearshore ocean waters where they remain until they become sexually mature, at around 3 years of age.

Critical habitat was designated in October 2011 and includes the Klamath River, Redwood Creek, and Mad River in California, which is the known southern extent of the Southern DPS population (76 FR 65323). The BSA/action area is not within critical habitat for Pacific eulachon– Southern DPS.

Survey Results

No surveys were conducted for Pacific eulachon or other fishes in the project BSA/action area. Based on occasional reports of individuals over the past few decades, they are thought to be infrequent visitors in winter in Humboldt Bay (Gustafson et al., 2010). They have occasionally been captured in Jolly Giant Creek and Jacoby Creek (tributaries to Humboldt Bay) during spawning season, but not in Freshwater Creek (Gustafson et al., 2010). They have not been captured in Humboldt Bay or Eureka Slough during fish surveys conducted using various types of active and passive sampling gear (e.g., Chamberlain and Barnhart

1993; Pinnix et al., 2004; Pinnix et al. 2005; Cole 2004). Their presence in the BSA/action area is highly unlikely.

Project Impacts

The project is not expected to impact Pacific eulachon because their presence in the BSA/action area is unlikely.

Under FESA, the project would have ***no effect*** on Pacific eulachon–Southern DPS.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on Pacific eulachon–Southern DPS.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect Pacific eulachon–Southern DPS, cumulative impacts are not anticipated.

4.3.11. Pacific Lamprey

Pacific lamprey (*Entosphenus tridentatus*) is a SSC. Pacific lamprey occur along the Pacific coast from Japan, through Alaska, and south to Baja California (CDFW 2015). In California, they occur from Los Angeles to Del Norte counties, although are uncommon south of San Luis Obispo County. They are anadromous, living in marine waters for 1 to 3 years, then migrating to freshwater in spring to spawn, after which they die. The young hatch and then rear as ammocetes in fresh water for 3 to 7 years; they burrow tail-first into soft stream sediments and filter feed on organic matter, often drifting at night to new areas. They use estuaries for foraging, rearing, and holding prior to migration. They have similar habitat requirements and co-occur with salmonids.

Survey Results

No surveys were conducted for lamprey or other fishes within the project BSA. Pacific lamprey has been reported from multiple spawning surveys and outmigrant traps in

Freshwater Creek which flows into Eureka Slough, and are thought to be widely distributed throughout the Freshwater Creek watershed (Stillwater Sciences 2016; Allen et al., 2016; Wallace et al., 2018). Adults and ammocetes may use the Eureka Slough within the BSA for foraging, rearing of ammocetes, and holding before migrating upstream to spawn.

Project Impacts

Potential stressors that could affect Pacific lamprey during geotechnical exploration are the same as those described for CC Chinook salmon and include 1) noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, 2) noise disturbance from three seismic refraction surveys in salt marsh, and 3) temporary impairment of water quality from geotechnical drilling into the channel.

The potential effects of geotechnical drilling and seismic refraction noise on Pacific lamprey are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality impacts on Pacific lamprey are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on Pacific lamprey.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect Pacific lamprey, cumulative impacts are not anticipated.

4.3.12. Steelhead – Northern California DPS and Critical Habitat

The steelhead (*Oncorhynchus mykiss irideus)*–Northern California (NC) DPS was listed as threatened in 2006 (71 FR 834). The DPS includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in California coastal river basins from Redwood Creek southward to, and including, the Gualala River, as well as

some federal and state propagation programs. Critical habitat was designated in 2005 and includes the same streams reaches identified by the final listing rule (70 FR 52629). The BSA/action area occurs within critical habitat.

NC steelhead enter coastal streams between November and April and spawn shortly after arriving in spawning areas (Moyle 2002). Successful migration depends on rainfall or snowmelt and sufficient stream flow to provide suitable passage conditions to upstream spawning areas. Winter-run steelhead generally spawn between December and April. After spawning, they may return to the ocean in spring.

Juvenile steelhead prefer streams with cool, clear, fast-flowing riffles, ample riparian cover and undercut banks, and abundant food (Moyle 2002). Newly emerged fry generally occupy shallow waters along stream margins while larger juveniles maintain territories in faster and deeper water in pools or runs. They typically rear in streams or estuaries for 1 to 2 years before entering the ocean. Downstream movement typically peaks in April or May although young-of-the-year have been reported to migrate to estuaries as late as June or July (Moyle et al., 2008). Smolts typically emigrate to the ocean between March and June, although bar formation across the mouth of coastal streams may prevent exit from the estuary until the bar breaches in late fall or winter (Moyle et al., 2008).

NC steelhead critical habitat includes sites essential to support one or more life stages of the DPS. These include freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, and estuarine areas for rearing and transitions between freshwater and saltwater. Within these sites, essential physical or biological features include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, space, and safe passage conditions.

Survey Results

No surveys were conducted for steelhead or other fishes in the BSA/action area. Steelhead spawn and rear in Freshwater Creek and estuary upstream of the ESL, and adult steelhead pass through Eureka Slough and Humboldt Bay during spawning runs in winter and smolt ocean migrations in spring (Anderson and Ward 2016; Allen et al., 2016; Wallace et al., 2018).

Steelhead are likely uncommon within the BSA/action area, having rarely been collected in Humboldt Bay and Eureka Slough during fish surveys conducted using various types of

active and passive sampling gear (e.g., Chamberlain and Barnhart 1993; Pinnix et al., 2004; Pinnix et al. 2005; Cole 2004).

Project Impacts

Potential stressors that could affect NC steelhead and critical habitat during geotechnical exploration are the same as those described for Chinook salmon and include 1) noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, 2) noise disturbance from three seismic refraction surveys in salt marsh, and 3) temporary impairment of water quality from geotechnical drilling into the channel.

The potential effects of geotechnical drilling and seismic refraction noise on NC steelhead are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality impacts on NC steelhead are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Potential water quality impacts as described above could also affect NC steelhead critical habitat. As described above, the potential exposure to this stressor is discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Under FESA, the project ***may affect, but is not likely to adversely affect***, NC steelhead and critical habitat for NC steelhead. Caltrans would initiate informal Section 7 consultation with NMFS to evaluate potential effects on NC steelhead and critical habitat.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on NC steelhead and critical habitat.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect NC steelhead and critical habitat, cumulative impacts are not anticipated.

4.3.13. Tidewater Goby

The federally endangered tidewater goby (*Eucyclogobius newberryi*) is a small fish that is endemic to California, ranging from the Smith River to northern San Diego County. They occur in coastal lagoons, brackish marshes, and estuaries that are seasonally disconnected from tidal action when sand bars form at the ocean's edge (Swenson 1999; Moyle 2002), or when anthropogenic structures (e.g., perched culverts, tide gates) mute tidal action (Ritter et al., 2008). They prefer areas with flood refugia, such as off-channel sloughs, pockets of still water, and "perched" habitats, particularly for the egg and larval life stages. Substrate is generally bare (e.g., sand and mud), and they also use areas with dense emergent vegetation for cover, especially *Ruppia* spp. (Chamberlain 2006). Although adults and juveniles are known to occur in a wide range of salinity levels (0–51 parts per thousand [ppt]), they generally occur at low to moderate salinities (2-15 ppt) (Stillwater Sciences 2006).

In general, tidewater goby live for only 1 year (Swenson 1999), although some live longer (Hellmair and Kinziger 2014). Spawning occurs from April through November, with distinct peaks in spring and late summer (Swenson 1999).

While critical habitat has been designated for the tidewater goby, the BSA/action area is not within critical habitat for the species.

Survey Results

No surveys were conducted for tidewater goby or other fishes within the BSA/action area. Given their preference for areas with muted tidal action and flood refugia, their presence is unlikely within the ESL in the open channel under the bridge and most areas of the BSA/action area. The only area of the BSA/action area that contains potentially suitable habitat where they could occur is a side channel on the southeast side of U.S. 101 near Boring Location 5 (B-5) and Geophysical Survey Location 4 (SL-4).

Project Impacts

Potential stressors that could affect tidewater goby during geotechnical exploration are similar to those described for Chinook salmon and include 1) noise disturbance from geotechnical drilling in uplands at boring Location 5, and 2) noise disturbance from seismic refraction surveys in uplands at Geophysical Survey Location 4.

The potential effects of geotechnical drilling and seismic refraction noise on tidewater goby are insignificant because they are short-term and minor and not expected to result in injury or behavioral disturbance, as described in Section 4.3.5. The potential effects of water quality

impacts on tidewater goby are likely discountable with implementation of standard measures and BMPs including spill prevention measures as identified in Section 1.2.

Under FESA, the project ***may affect, but is not likely to adversely affect***, tidewater goby. The Programmatic Letter of Concurrence (PLOC) issued by the USFWS will be used for potential effects of the project on tidewater goby.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on tidewater goby.

Compensatory Mitigation

No compensatory mitigation is proposed because no impacts were identified that require mitigation.

Cumulative Impacts

Given that the project would not adversely affect tidewater goby, cumulative impacts are not anticipated.

4.4. Discussion of Migratory Birds / Migratory Bird Treaty Act

The Federal Migratory Bird Treaty Act (MBTA) (15 USC 703-711), Title 50 Code of Federal Regulations (CFR) Part 21 and 50 CFR Part 10, the California Fish and Game Code (CFGC) Sections 3503, 3513, 3800, and AB-2627 protect migratory birds, their occupied nests, and their eggs from disturbance or destruction. The MBTA provides protection in part by restricting the disturbance of nests during the bird nesting season.

Survey Results

No surveys were conducted for migratory birds.

Project Impacts

No nests would be removed or altered during project activities. A minor amount of coastal scrub vegetation would be trimmed for equipment access to some of the boring holes. Vegetation trimming or removal would likely occur during the bird breeding season (between February 1 and September 15) but would be delayed until at least August 15 which is after coastal scrub bird species are likely to have fledged young. In addition, a nesting bird survey

would be conducted by a qualified biologist within five days prior to removal. If an active nest is located, the biologist would coordinate with the CDFW to establish appropriate species-specific buffer(s) and any monitoring requirements. The appropriate buffer would be delineated around each active nest, and vegetation removal and project activities would be excluded from these areas.

Impacts to migratory birds are not anticipated given the minimal amount of vegetation to be removed, temporary nature of the project, and the standard measures to avoid disturbing active nests.

Avoidance and Minimization Efforts

Standard protection measures, as identified in Section 1.2, would be implemented to avoid and minimize impacts to migratory birds.

Compensatory Mitigation

No compensatory mitigation is proposed because no effects have been identified that require mitigation.

Cumulative Impacts

Given the project would not impact migratory birds or permanently affect potentially suitable habitat for migratory birds, cumulative impacts are not anticipated.

4.5. Discussion of Essential Fish Habitat

Essential Fish Habitat (EFH) is defined by the Magnuson-Stevens Fishery Conservation and Management Act for federally managed species as "those waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity".

Survey Results

No surveys of EFH were conducted. The BSA/action area is within EFH for Chinook salmon and coho salmon, Pacific Coast groundfish, and coastal pelagic species. Eelgrass, which also occurs within the BSA/action area, is considered a Habitat Area of Particular Concern (HAPC) for Pacific Coast groundfish.

Project Impacts

Temporary impairment of water quality from geotechnical drilling into the channel is a potential stressor that could affect EFH for Chinook salmon and coho salmon, Pacific Coast

Groundfish, and Coastal Pelagic Species. As described in Section 4.3, these potential effects are likely discountable with incorporation of the standard measures and BMPs designed to protect water quality.

Potential stressors on eelgrass habitat that could affect the Eelgrass HAPC for Pacific Coast groundfish are described in Section 4.1.4 Eelgrass. Based on those analyses, with incorporation of the standard measures and BMPs designed to protect water quality, potential effects on EFH for Chinook salmon and coho salmon, Pacific Coast groundfish (including Eelgrass HAPC), and coastal pelagic species are likely discountable.

The project ***may adversely affect*** EFH for Chinook salmon and coho salmon, Pacific Coast groundfish, and coastal pelagic species.

Avoidance and Minimization Efforts

Standard protection measures and BMPs to protect water quality and special status fish species, as identified in Section 1.2, would be implemented to avoid and minimize effects on EFH for Chinook salmon and coho salmon, Pacific Coast groundfish, and coastal pelagic species.

Compensatory Mitigation

No compensatory mitigation is proposed because no effects have been identified that require mitigation.

Cumulative Impacts

Given the project would not adversely affect EFH for Chinook salmon and coho salmon, Pacific Coast groundfish, and coastal pelagic species, cumulative impacts are not anticipated.

4.6. Discussion of Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) establishes a federal responsibility to conserve marine mammals, with management vested in the National Marine Fisheries Service (NMFS) for cetaceans and pinnipeds other than walrus. The Department of the Interior is responsible for all other marine mammals, including sea otter, walrus, polar bear, dugon, and manatee. The MMPA protects marine mammal species and their habitats in an effort to maintain sustainable populations. The statute outlines prohibitions, required permits, criminal and civil penalties, and international aspects in addressing marine mammals. The MMPA requires

consultation on any action that may adversely affect marine mammals and provides a mechanism for an "incidental" take of species not listed under FESA.

Survey Results

No surveys for marine mammals were conducted. California sea lion (*Zalophus californianus*), harbor porpoise (*Phocoena phocoena*), and harbor seal (*Phoca vitulina*) are known to occur in Humboldt Bay.

California sea lions do not breed in northern California; however, non-breeding or migrating individuals are known to occur in Humboldt Bay year-round.

Harbor porpoises have been observed throughout the year at the entrance to, and within, Humboldt Bay, usually as single individuals but sometimes in small groups (Goetz 1983).

Harbor seals range throughout the northern Atlantic and Pacific oceans, and occur in coastal waters, river mouths, and estuaries. They haul-out on tidal mudflats in Humboldt Bay for resting, molting, parturition, and rearing of young (Loughlin 1974; Sullivan 1979; Ougzin 2013). Numbers within the bay peak between May and October, during flood tides. There are no known haul-out areas for harbor seals within the vicinity of Eureka Slough Bridge. The nearest haul-outs to the ESL were reported on mudflats approximately 0.7 mile from the ESL where Eureka Slough joins Humboldt Bay (CDFW-CNDDB 2021).

Project Impacts

Noise disturbance from geotechnical drilling of up to 10 borings through the bridge deck into the tidal channel, and from three seismic refraction surveys in salt marsh, are potential stressors that could affect sea lions, harbor porpoise, and harbor seals within the BSA/action area. Underwater noise can result in behavioral disturbance or physical injury to marine mammals if injury thresholds are exceeded. The acoustic threshold for behavioral disruption of marine mammals from non-impulsive underwater sounds is 120 dB rms (root mean square) and for injury 199 dB and higher, depending on species (NMFS 2018). As described in Section 1.1, the underwater noise generated by geotechnical drilling and seismic refractions surveys are expected to be below thresholds.

California sea lions, harbor porpoise, and harbor seals could occur within the BSA/action area during geotechnical exploration. However, since noise disturbance is not expected to exceed the behavioral disruption or injury thresholds for marine mammals, potential effects on marine mammals are insignificant.

Under the MMPA, the project would not result in take or harassment of marine mammals.

Avoidance and Minimization Efforts

No avoidance or minimization measures are proposed.

Compensatory Mitigation

No compensatory mitigation is proposed because no effects have been identified that require mitigation.

Cumulative Impacts

Given the project would not affect marine mammals, cumulative impacts are not anticipated.

CHAPTER 5. CONCLUSIONS AND REGULATORY DETERMINATIONS

5.1. Federal Endangered Species Act Consultation

Caltrans has determined the project ***may affect, is not likely to adversely affect*** USFWS administered federally listed species. Consultation would be carried out through the USFWS Programmatic Letter of Concurrence (PLOC) for effects of the project on the federally threatened tidewater goby (*Eucyclogobius newberryi*).

Caltrans has determined the project ***may affect, is not likely to adversely affect*** NMFS-administered federally listed species. Section 7 Consultation with NMFS would be conducted for effects on the following federally listed species:

- Chinook salmon (*Oncorhynchus tshawytscha*)–California Coast ESU and critical habitat
- Coho salmon (*Oncorhynchus kisutch*)–Southern Oregon/Northern California Coast ESU and critical habitat
- North American green sturgeon (*Acipenser medirostris*)–Southern DPS and critical habitat
- Steelhead trout (*Oncorhynchus mykiss irideus*)–Northern California DPS and critical habitat

Caltrans has determined the project would have ***no effect*** on the following federally listed species or species proposed for listing:

- Beach layia (*Layia carnosa*)
- Menzies' wallflower (*Erysimum menziesii*)
- Western lily (*Lilium occidentale*)
- East Pacific green sea turtle (*Chelonia mydas*)
- Leatherback sea turtle (*Dermochelys coriacea*)
- Olive Ridley sea turtle (*Lepidochelys olivacea*)
- California ridgeway's rail (*Rallus obsoletus obsoletus*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- Short-tailed albatross (*Phoebastria albatrus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Yellow-billed cuckoo–Western DPS (*Coccyzus americanus*)
- Pacific eulachon–Southern DPS (*Thaleichthys pacificus*)
- Pacific marten–Coastal DPS (*Martes caurina humboldtensis*)

- Blue whale (*Balaenoptera musculus*)
- Fin whale (*Balaenoptera physalus*)
- Humpback whale (*Megaptera novaeangliae*)
- North Pacific right whale (*Eubalaena japonica*)
- Sei whale (*Balaenoptera borealis*)
- Sperm whale (*Physeter macrocephalus*)
- Southern resident killer whale (*Orcinus orca*)
- Monarch butterfly (*Danaus plexippus*)

5.2. Essential Fish Habitat Consultation

Caltrans has determined the project ***may adversely affect*** EFH for Chinook salmon and coho salmon, Pacific Coast groundfish, and coastal pelagic species.

5.3. California Endangered Species Act Consultation

Caltrans has determined the project would have no ***"take"*** of the following state-listed species, species proposed for listing, and fully protected species that may occur within the project area:

- Beach layia (*Layia carnosa*)
- Menzies' wallflower (*Erysimum menziesii*)
- Western lily (*Lilium occidentale*)
- American peregrine falcon (*Falco peregrinus anatum*)
- Bald eagle (*Haliaeetus leucocephalus*)
- Bank swallow (*Riparia riparia*)
- California brown pelican (*Pelecanus occidentalis californicus*)
- California ridgeway's rail (*Rallus obsoletus obsoletus*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- White-tailed kite (*Elanus leucurus*)
- Yellow-billed cuckoo (*Coccyzus americanus*)
- Coho salmon (*Oncorhynchus kisutch*)–SONCC ESU
- Longfin smelt (*Spirinchus thaleichthys*)
- Steelhead trout (*Oncorhynchus mykiss irideus*)–Northern California summer run
- Pacific marten–Coastal DPS (*Martes caurina humboldtensis*)
- Crotch bumble bee (*Bombus crotchii*)

- Western bumble bee (*Bombus occidentalis*)

5.4. California Species of Special Concern

The California Department of Fish and Wildlife (CDFW) maintains a list of plant and animal Species of Special Concern (SSC), most of which are species whose breeding populations in California may face extirpation. Although these species have no legal status, the CDFW recommends their consideration during analysis of the impacts of the proposed project to protect declining populations and avoid the need to list them as endangered in the future. This project could impact the following SSCs that may occur within the project area:

- Coastal cutthroat trout (*Oncorhynchus clarkii clarkii*)
- Pacific lamprey (*Entosphenus tridentatus*)
- Tidewater goby (*Eucyclogobius newberryi*)

Standard protection measures and BMPs to protect water quality and fish would be implemented to avoid and minimize impacts on these species.

This project would not impact the following SSCs:

- Foothill yellow-legged frog (*Rana boylii*)–North Coast DPS
- Northern red-legged frog (*Rana aurora*)
- Pacific tailed frog (*Ascaphus truei*)
- Southern torrent salamander (*Rhyactotriton variegatus*)
- Western pond turtle (*Emys marmorata*)
- Brant (*Branta bernicla*)
- Mountain plover (Charadrius montanus)
- Northern harrier (*Circus hudsonius*)
- Western snowy plover (*Charadrius nivosus nivosus*)
- Yellow rail (*Coturnicops noveboracensis*)
- Western brook lamprey (*Lampetra richardsoni*)
- Sonoma tree vole (*Arborimus pomo*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- White-footed vole (*Arborimus albipes*)

5.5. Wetlands and Other Waters Coordination

The project would require a USACE Section 404 Nationwide Permit 6 from U.S. Army Corps of Engineers and a Section 401 Water Quality Certification from the NCRWQCB for temporary and permanent impacts to wetlands and Waters of the U.S. and State.

5.6. Lake or Streambed Alteration Agreement

The project would require a CDFW 1602 Lake or Streambed Alteration Agreement from CDFW.

5.7. Migratory Bird Treaty Act

Federal and state laws protect migratory birds, their occupied nests, and their eggs from destruction. Migratory bird species are likely to be nesting in coastal scrub within the ESL. To avoid impacts on migratory birds, standard measures to protect nesting birds (Section 1.2) would be implemented.

5.8. Marine Mammal Protection Act

Marine mammals are protected under the Marine Mammal Protection Act. The following marine mammals could occur in the BSA: California sea lion (*Zalophus californianus*), harbor porpoise (*Phocoena Phocoena*), and harbor seal (*Phoca vitulina*). Effects on these species from the project are not anticipated.

5.9. Invasive Species

Under Executive Order 13112, 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, including spores, in the United States or elsewhere unless all reasonable measures to minimize risk of harm have been analyzed and considered. The project would avoid the spread of known and potentially occurring invasive species and plant pathogens.

5.10. Native Plant Protection Act

California's Native Plant Protection Act requires all state agencies to utilize their authority to carry out programs to conserve endangered and rare native plants (CFGC Sections 1900–1913). The following rare plant species occur within the BSA:

- Humboldt Bay owl's-clover (*Castilleja ambigua* var. *humboldtiensis*)

- Point Reyes bird's beak (*Chloropyron maritimum* ssp. *palustre*)

Standard measures would be implemented to avoid impacts on these plant species.

5.11. Coastal Zone Management Act / California Coastal Act

The BSA is within the Coastal Zone regulated under the Coastal Zone Management Act and California Coastal Act. There are several ESHAs within the BSA that would be temporarily impacted by the project. Caltrans would coordinate with the California Coastal Commission to obtain a Coastal Development Permit or waiver for the project.

CHAPTER 6. REFERENCES

Allen, S, E. Ojerholm, and M. Wallace. 2016. Juvenile Salmonid Use and Restoration Assessment of the Tidal Portions of Selected Tributaries to Humboldt Bay, California, 2013-2015. Fisheries Restoration Grant Program Final Report Contract P1110524.

Anderson C. W., and D. Ward. 2016. Results of Freshwater Creek salmonid life cycle monitoring station 2015-2016. Humboldt State University, Department of Fisheries Biology.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken (eds 2012). The Jepson Manual: Vascular Plants of California, 2nd edition. University of California Press, Berkeley, CA.

Barnhart, R. A., M. J. Boyd, and J. E. Pequegnat. 1992. The Ecology of Humboldt Bay, California: An Estuarine Profile. U.S. Fish and Wildlife Service. Biological Report 1.

Bell, E., and W. G. Duffy. 2007. Previously undocumented two-year freshwater residency of juvenile coho salmon in Prairie Creek, California. Transactions of the American Fisheries Society 136(4):966-970.

CalFlora. 2021. https://www.calflora.org/. Accessed April 2021.

California Department of Fish and Wildlife (CDFW). 2015. Pacific Lamprey. FSSC Account. 2015 Fish Species of Special Concern. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=104360. Accessed July 1, 2021.

_____. 2018. Protocols for Surveying and Evaluating Special Status Native Plant Populations and Natural Communities. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline. Accessed September 9, 2022.

_____. 2023. California Natural Community List. Vegetation Classification and Mapping Program. Prepared by the Wildlife and Habitat Data Analysis Branch. Sacramento, California. https://www.wildlife.ca.gov/Data/VegCAMP/Natural-Communities. Accessed between November 2021, May 2022, and January 26, 2023.

CDFW- CNDDB. 2021. California Natural Diversity Database. 2021. Bios Version 5. https://apps.wildlife.ca.gov/bios6/?tool=cnddbqv Accessed November 11, 2021.

_____. 2023. RareFind 5. California Department of Fish and Wildlife. https://www.wildlife.ca.gov/Data/CNDDB. Accessed November 15, 2022, and January 26, 2023.

California Native Plant Society (CPNS). 2022. A Manual of California Vegetation, Online Edition. http://www.cnps.org/cnps/vegetation/. Accessed November 15, 2022.

_____. 2023. Inventory of Rare, Threatened, and Endangered Plants of California. http://www.rareplants.cnps.org/. Accessed November 15, 2022, and January 26, 2023.

California Department of Transportation (Caltrans). 2015. Technical Guidance for Assessment of the Hydroacoustic Effects of Pile Driving on Fish. Prepared by ICF International and Illingworth and Rodkin, Inc. November 2015.

_____. 2019a. Caltrans Drilling Services Quality Management Plan.

_____. 2019b. Caltrans Engineering Technical Brief Draft Hydroacoustic Analysis for Geotechnical Drilling and Sampling. TAN-19-01. Prepared by ICF and Caltrans May 2019.

_____. 2022. Eureka Slough Bridges Project Preliminary Eelgrass Report. January 2022.

Chamberlain, C. D. 2006. Environmental Variables of Northern California Lagoons and Estuaries and the Distribution of Tidewater Goby (*Eucyclogobius newberryi*). Arcata Fisheries Technical Report Number TR 2006-04. U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata, California.

Chamberlain, R. H., and R. A. Barnhart. 1993. Early use by fish of a mitigation salt marsh, Humboldt Bay, California. Estuaries 16(4):769-783.

Cole, M. E. 2004. Distribution of Fish Species in Humboldt Bay, Humboldt County, California, USA: A GIS Perspective. Master's Thesis. Humboldt State University, Arcata, California.

Consortium of California Herbaria. 2021. https://ucjeps.berkeley.edu/consortium/. Accessed April 2021.

EBird. 2021. https://ebird.org/explore. Accessed August 5, 2021.

Davis, J. N., and B. E. Deuel. 2008. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Shuford, W. D., and Gardali, T., editors. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Vicksburg, MS: USACE Waterways Experiment Station.

Fisheries Hydroacoustic Working Group (FHWG). 2008. Memorandum: Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities.

Fritzsche, R. A., and J. W. Cavanagh. 1995. A Guide to the Fishes of Humboldt Bay. Arcata, California: Humboldt State University Press.

Garwood, R. S. 2017. Historic and contemporary distribution of Longfin Smelt (*Spirinchus thaleichthys*) along the California coast. California Fish and Game 103:96-117.

Goetz, B. J. 1983. Harbor Porpoise *(Phocoena phocoena, L.)* Movements in Humboldt Bay, California and Adjacent Ocean Waters. Master's thesis. Humboldt State University, Arcata, California.

Gotshall, D. W., G. H. Allen, and R. A. Barnhart. 1980. An Annotated Checklist of Fishes from Humboldt Bay, California. California Fish and Game. 66(4):220-232.

Gustafson, R. G., M. J. Ford, D. Teel, and J. S. Drake. 2010. Status Review of Eulachon (*Thaleichthys pacificus*) in Washington, Oregon, and California. NOAA-Fisheries Tech. Memo. NMFSNWFSC-105.

Hamer, T. E., and S. K. Nelson. 1995. Nesting Chronology of the Marbled Murrelet. Pp. 49-56 In: Ecology and Conservation of the Marbled Murrelet (C. J. Ralph, G. L. Hunt, Jr., M. G. Raphael, and J. F. Piatt, eds.). U.S. Forest Service, Gen. Tech. Rep. PSW-GTR-152, Pacific Southwest Research Station, Albany, CA.

Healey, M. C. 1991. Life History of Chinook salmon (*Oncorhynchus tshawytscha*). Pp. 311-393 in: Pacific Salmon Life Histories. (C. Groot and L. Margolis, eds.). University of British Columbia Press, Vancouver, Canada.

Hébert, P. N., and R. T. Golightly. 2006. Movements, Nesting, and Response to Anthropogenic Disturbance of Marbled Murrelets (*Brachyramphus marmoratus*) in Redwood National and State Parks, California. Unpublished report. Department of Wildlife, Humboldt State University, Arcata, California and California Department of Fish and Game Report 2006-02, Sacramento, California.

Hellmair M., and A. P. Kinziger. 2014. Increased Extinction Potential of Insular Fish Populations with Reduced Life History Variation and Low Genetic Diversity. PLoS ONE 9(11): e113139. https://doi.org/10.1371/journal.pone.0113139

Jaques, D. L., H. R. Carter, and P. J. Capitolo. 2008. A Brown Pelican Roost Site Atlas for Northern and Central California. Unpublished report, Pacific Eco Logic, Astoria, Oregon; and Carter Biological Consulting, Victoria, British Columbia.

Jennings, M. R. 1996. Past Occurrence of Eulachon, *Thaleichthys pacificus*, in Streams Tributary to Humboldt Bay, California. California Fish and Game 82:147-148.

Jepson Flora Project. 2023. The Jepson Herbarium. University of California, Berkeley. https://ucjeps.berkeley.edu/jepsonflora/. Accessed January 6, 2023.

Johnson, O. W., M. H. Ruckelshaus, W. S. Grant, F. W. Waknitz, A. M. Garrett, G. J. Bryant, K. Neely, and J. J. Hard. 1999. Status Review of Coastal Cutthroat Trout from Washington, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-37.

Kelly, J. T., A. P. Klimley, and C. E. Crocker. 2007. Movements of green sturgeon, *Acipenser medirostris*, in the San Francisco Bay estuary, California. Environmental Biology of Fishes 79:281-295.

Lindley, S. T., M. L. Moser, D. L. Erickson, M. Belchik, D. W. Welch, E. Rechisky, J. T. Kelly, J. Heublein, and A. P. Klimley. 2008. Marine migration of North American green sturgeon. Transactions of the American Fisheries Society 137:182-194.

Lindley, S. T., D. L. Erickson, M. L. Moser, G. Williams, O. P. Langness, B. McCovey, Jr., D. Vogel, W. Pinnix, J. T. Kelly, J. C. Heublein, and A. P. Klimley. 2011. Electronic tagging of green sturgeon reveals population structure and movement among estuaries. Transactions of the American Fisheries Society 140:108-122.

Loughlin, T. R. 1974. The Distribution and Ecology of the Harbor Seal in Humboldt Bay, California. Master's Thesis, Humboldt State University, Arcata, California.

Mersel, M. K. and R. W. Lichvar. 2014. A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States. U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory.

Monroe, G. W., S. J. Thompson, P. G. Swartzell, B. M. Browning, and J. W. Speth. 1973. The Natural Resources of Humboldt Bay. California Department of Fish and Game. Coastal Wetland Series #6.

Moore, J. E., M. A. Colwell, R. L. Mathis, and J. M. Black. 2004. Staging of Pacific Flyway Brant in Relation to Eelgrass Abundance and Site Isolation, with Special Consideration of Humboldt Bay, California. Biological Conservation 115:475–486.

Moser, M. L., and S. T. Lindley. 2007. Use of Washington Estuaries by Subadult and Adult Green Sturgeon. Environmental Biology of Fishes 79:243-253.

Moyle, P. B. 2002. Inland Fishes of California. University of California Press, Berkeley.

Moyle, P. B., P. J. Foley, and R. M. Yoshiyama. 1992. Status of Green Sturgeon, *Acipenser medirostris*, in California. Final Report submitted to National Marine Fisheries Service. 11 pp. University of California, Davis, California.

Moyle, P. B., J. A. Israel, and S. E. Purdy. 2008. Salmon, Steelhead and Trout in California: Status of an Emblematic Fauna. Prepared for California Trout by University of California, Davis, Center for Watershed Science. 316 pp.

Naslund, N. L. 1993. Why do marbled murrelets attend old-growth forest nesting areas year round? Auk 110:594-602.

National Marine Fisheries Service (NMFS). 2013. Programmatic Biological Opinion and Essential Fish Habitat Consultation for Caltrans' Routine Maintenance and Repair Activities in Districts 1, 2, and 4. October 18, 2013. Southwest Region, Long Beach, CA. NMFS No. 2013/9731.

_____. 2018. 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commerce, NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 p

_____. 2023. NMFS California Species List Tool. http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html. Accessed September 9, 2022 and January 26, 2023.

Ougzin, A. M. 2013. Foraging Behavior of the Pacific Harbor Seal (*Phoca vitulina richardsi*) in Humboldt Bay, California. Master's Thesis. Humboldt State University, Arcata, California.

Pacific Fishery Management Council. 2014. Identification and Description of Essential Fish Habitat, Adverse Impacts, and Recommended Conservation Measures for Salmon. Appendix A to the Pacific Coast Salmon Fishery Management Plan.

Pinnix, W. D., T. A. Shaw, K. C. Acker and N. J. Hetrick. 2004. Fish Communities in Eelgrass, Oyster Culture, and Mudflat Habitats of North Humboldt Bay, California. Progress Report. U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata Fisheries Technical Report Number AFWO-F-07-04, Arcata, California.

_____. 2005. Fish Communities in Eelgrass, Oyster Culture, and Mudflat Habitats of North Humboldt Bay, California. Final Report. U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata Fisheries Technical Report Number TR2005-02, Arcata, California.

Pinnix, W. D., P. A. Nelson, G. Stutzer, and K. A. Wright. 2013. Residence time and habitat use of coho salmon in Humboldt Bay, California: an acoustic telemetry study. Environmental Biology of Fishes 96:315-323.

Ralph, C. J., G. L. Hunt, Jr., M. G. Raphael, and J. F. Piatt. 1995. Ecology and Conservation of the Marbled Murrelet in North America: An Overview. Pp. 3-23 In: Ecology and conservation of the Marbled Murrelet (C.J. Ralph, G.L. Hunt, Jr., M.G. Raphael, and J.F. Piatt, eds.). U.S. Forest Service, Gen. Tech. Rep. PSW-GTR-152, Pacific Southwest Research Station, Albany, CA.

Rebenack, J. J., S. Ricker, C. Anderson, M. Wallace, and D. Ward. 2015. Early emigration of juvenile coho salmon: implications for population monitoring. Transactions of the American Fisheries Society 144(1):163-172.

Ritter, A.F., K. Wasson, S. I. Lonhart, R. K. Preisler, A, Woolfolk, K. A. Griffith, S. Connors, and K. W. Heiman. 2008. Ecological Signatures of Anthropogenically Altered Tidal Exchange in Estuarine Ecosystems. Estuaries and Coasts 31:554–571. https://doi.org/10.1007/s12237-008-9044-9

Sawyer, J. O., T. Keeler-Wolf, J. M. Evens. 2009. A Manual of California Vegetation. Second Edition. California Plant Native Society Press, Sacramento, CA.

Schlosser, S. C. and A. Eicher. 2012. Humboldt Bay and Eel River Estuary Benthic Habitat Project. California Sea Grant College Program, Scripps Institution of Oceanography, University of California San Diego.

Shapovalov, L., and A. C. Taft. 1954. The Life Histories of the Steelhead Rainbow Trout (*Salmo gairdneri gairdneri*) and Silver Salmon (*Oncorhynchus kisutch*). California Department Fish and Game, Fish Bulletin 98.

Stillwater Sciences. 2006. Guidelines to Evaluate, Modify and Develop Estuarine Restoration Projects for Tidewater Goby Habitat. Final report. Arcata, California. Prepared for U.S. Fish and Wildlife Service, Arcata, California.

———. 2016. Pacific Lamprey in Humboldt Bay Tributaries: A Summary of Information and Identification of Research Needs. Prepared by Stillwater Sciences, Arcata, California for Wiyot Tribe, Loleta, California.

Sullivan, R. M. 1979. Behavior and Ecology of Harbor Seals, *Phoca vitulina*, Along the Open Coast of Northern California. Master's Thesis, Humboldt State University, CA. 115 pp.

Swenson, R. O. 1999. The ecology, behavior, and conservation of the tidewater goby, *Eucyclogobius newberryi*. Environmental Biology of Fishes 55:99–119.

Teachout, E. 2012. Evaluating the Effects of Underwater Sound from Pile Driving on the Marbled Murrelet and the Bull Trout. Washington Fish and Wildlife Office, Lacey, Washington.

U.S. Army Corps of Engineers (USACE). 2005. Ordinary High Water Mark Identification. Regulatory Guidance Letter No. 05-05.

_____. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). Eds. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U.S. Fish and Wildlife Service (USFWS). 2022a. National Wetlands Inventory Mapper. https://www.fws.gov/program/national-wetlands-inventory/wetlands-mapper. Accessed November 15, 2022.

_____. 2022b. Reinitiation of Informal Consultation for the California Department of Transportation's Routine Maintenance and Repair Activities, and Small Projects Program for Districts 1 and 2. Project Code 2022-0062929. Arcata Fish and Wildlife Office.

_____. 2023. Information for Planning and Consultation. https://ecos.fws.gov/ipac/ Accessed May 15 and September 9, 2022, and January 26, 2023.

Wallace, M. 2006. Juvenile Salmonid Use of Freshwater Slough and Tidal Portion of Freshwater Creek, Humboldt Bay, California. 2003 Annual Report. Inland Fisheries Administrative Report 2006-04. California Department of Fish and Game, Sacramento.

Wallace, M., and S. Allen. 2007. Juvenile Salmonid Use of the Tidal Portions of Selected Tributaries to Humboldt Bay, California. June 2007. California Department of Fish and Game and Pacific States Marine Fisheries Commission. Contract P0410504.

Wallace, M., and S. Allen. 2012. Juvenile Salmonid Use of the Tidal Portions of Selected Tributaries to Humboldt Bay, California, 2009-2011. Prepared by the Natural Stocks

Assessment Project, California Department of Fish and Game and Pacific States Marine Fisheries Commission. 45 p.

Wallace, M., S. Ricker, J. Garwood, A. Frimodig, and S. Allen. 2015. Importance of the stream-estuary ecotone to juvenile coho salmon (*Oncorhynchus kisutch*) in Humboldt Bay, California. California Fish and Game 101(4):241-266.

Wallace, M., E. Ojerholm, A. Scheiff, and S. Allen. 2018. Juvenile Salmonid Use and Restoration Assessment of the Tidal Portions of Selected Tributaries to Humboldt Bay, California, 2015-2017. Fisheries Restoration Grant Program Final Report Contract P1310520.

White, C. M., N. J. Clum, T. J. Cade, and W. G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus).* In A. Poole and F. Gill (eds.), The Birds of North America, No. 660. The Academy of Natural Sciences, Philadelphia, PA and the American Ornithologists' Union, Washington, DC. U.S.

PERSONAL COMMUNICATIONS

W. Pinnix, USFWS, personal communication. November 21, 2022

R. Pommerenck, Caltrans Office of Engineering South, personal communication. February 15, 2023

APPENDIX A. Project Plans/Layouts

Memorandum

To: JEFFREY PIMENTEL
Project Manager
District 1

Date: February 15, 2022

File: 01-HUM-101-79.5/80.2
01-0F200
0115000088
Eureka Slough Bridges

Attention: Jason Meyer

(Replace)

From: GEOTECHNICAL SERVICES
Office of Geotechnical Design West
Branch F

Subject: **PRELIMINARY SITE INVESTIGATION PLAN FOR THE EUREKA SLOUGH BRIDGES (REPLACE)**

Introduction

The Office of Geotechnical Design West (OGDW) has prepared this memorandum summarizing the proposed geotechnical investigation to support the design and construction of two to three bridges, to replace the existing northbound and southbound bridges crossing Eureka Slough, between PM 79.5 and 80.2 of Highway 101 in Humboldt County, California. This memo shall serve as a request for environmental clearance to drill and perform geophysical surveys at the proposed boring and geophysical line locations.

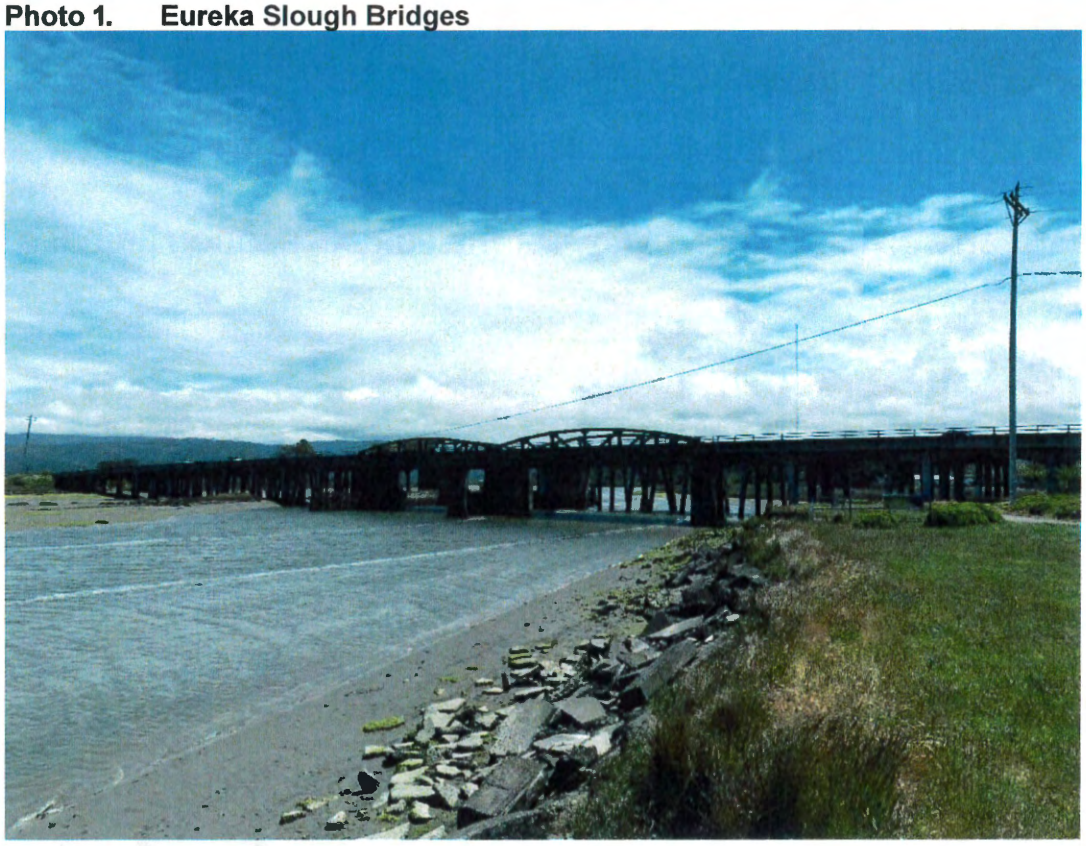
The purpose of this project is to address seismic deficiencies as well as improve the function and geometrics of the Eureka Slough Bridges to ensure uninterrupted traffic movement in the event of a collision or emergency incident, earthquake or any other catastrophic event. Replacement structures built to current standards with separated pedestrian pathways would promote and enhance mobility for all modes of transportation. The southbound structure, built in 1943, has seismic deficiencies, is fracture critical and has a non-standard profile which contributes to a collision rate at the bridge departure that is double the statewide average for similar facilities. The northbound structure, built in 1956, also has seismic deficiencies and has non-standard bridge rails built on raised concrete curbs within the shoulders. Both structures have exceeded their design life and have narrow shoulders that impede multimodal transportation.

OGDW proposes to conduct a geotechnical investigation of subsurface conditions to support the design and construction of the proposed bridges. The information from the

subsurface data will used to generate a "Log of Test Borings" (LOTB). The LOTB is a contractual document that provides the subsurface and geological information for the project site. The LOTB sheets are signed by a State of California Registered Civil Engineer or Registered Geologist and are included in Caltrans Contract Plans.

This preliminary site investigation plan outlines the procedures to obtain the subsurface information at the proposed replacement bridge locations. Drilling will be performed on the proposed bridge alignments at or near the proposed foundation locations. The exact number and locations of the borings will be determined once the General and Foundation Plans are received from Structure Design, indicating the proposed foundation locations.

Photo 1. Eureka Slough Bridges



Exploration Stages

Based on previous explorations in the vicinity of the project, we anticipate the subsurface conditions to include near surface groundwater, and soft, compressible bay mud overlying unconsolidated alluvium and Late Pleistocene to middle Miocene sandstone at depth. To adequately characterize and evaluate these conditions in the area of the proposed structure foundations, we propose to perform a staged investigation in the following order: 1) geophysical surveys, 2) geotechnical drilling, and 3) PS suspension logging. The approximate locations of the proposed borings and

geophysical surveys have been included in the attached Layout Plan Sheets.

1. Geophysical Surveys

To help characterize the subsurface conditions, estimate the depth of soft mud, and evaluate geologic variability, we propose to perform up to 6 geophysical surveys at the locations shown on the attached Layout Plan Sheets. Each of these survey lines will be between approximately 200 and 500 feet in length.

Caltrans Geophysical Branch or an appropriate consultant will perform seismic refraction and electrical resistivity surveys at the proposed line locations. We anticipate the geophysical survey of each of the seismic lines will take approximately two days to complete. The total geophysical exploration time is estimated to take approximately 12 working days. We anticipate that traffic control will not be required to conduct geophysical surveys and anticipate performing these surveys ahead of the drilling to support refinement of the drilling layout.

We anticipate that minor brushing may be required for lines SL-4 and SL-5, sufficient to provide unobstructed access to the ground to layout the cables connecting the geophones and copper probes. This will likely consist of an approximately 3-foot-wide strip cut back to a height of 6-inches above the ground to promote regrowth. We anticipate that no earthwork will be required to access or perform the proposed surveys.

Additional mitigation measures for geotechnical work developed by Caltrans North Region Environmental will be followed. These additional measures are included as Appendix I.

Geophysical Equipment

Seismic Refraction Surveys

Seismic survey equipment consists of an array of 24 geophones (seismic sensors) connected by a specialized cable to a battery powered seismograph unit, a seismic source. Seismic sources typically consist of either a hammer and striker plate, a down-hole shotgun, or explosives. This equipment can be transported to the site in a single crew cab and transported for short distances around the site on foot.

The hammer and striker plate source consists of a 12- to 16-lb sledgehammer struck against a small metal or HDPE plate placed on the ground. This creates the least ground disturbance (a dent or divot in ground in the shape of the plate). Contrary to expectation, when a metal striker plate is used, this source creates the greatest noise of the three available sources. The "ping" from the hammer striking the metal plate may exceed 110 dB within 1 meter of the source, so hearing protection is normally required when operating with the metal plate. Sound pressure fall-off with distance from the source is significant and approaches background within 120-140 feet of the source.

Additional noise abatement may be achieved using the HDPE striker plate where stricter noise control is required.

The down-hole shotgun uses an industrial shell fired in a minimum 1.5-foot-deep water-filled hole. The hole is created using a hand auger. The industrial shell is an 8-gauge 350- to 500-grain blank shotgun cartridge. Shells are typically triggered approximately 20 minutes apart. Shotgun detonations may leave an area of disturbed earth up to 2 feet in diameter. An effort is made to tamp down the soil to return it to its original condition. There are no appreciable effects on flora or fauna outside that diameter. Detonation of the shells occurs below ground and usually does not pose a fire hazard, but fire suppression equipment is kept on hand when working during wildfire season. With well-prepared shot holes, the highest anticipated noise generated consists of a muffled "thump" of approximately 80 dB. More often than not, the fired shells are barely audible.

Small explosive charges may also be employed where deep imaging is required and high seismic impedance is anticipated. All work related to explosives is conducted by a licensed blaster following state and federal safety mandates. When used the charges are placed below the ground surface in a 1.5- to 3-foot-deep hole excavated by hand auger or by manually driving 2.5-inch diameter gad bar. The charge is placed, the hole backfilled and the charge detonated using an electric cap. With well-prepared shot holes, the highest anticipated noise generated during detonation is an approximately 80 dB muffled "thump". Ground disturbance is limited to an area of raised ground around the detonation site. Any holes are filled after completion of the work and the ground surface returned to its original condition to the extent possible.

Electrical Resistivity Surveys

Surface resistivity is another non-destructive geophysical survey method used to investigate subsurface conditions. Low ground resistivity is associated with clay soils, moist soils, buried metal, and other conductive materials. High ground resistivity is common in sandy soils, dry soils, and other relatively non-conductive materials.

Caltrans Geophysics and Geology Branch uses an Automatic Resistivity System II (ARES II) manufactured by GF Instruments, multi-electrode cables, copper stakes, and a 12-volt battery, with up to 40 channels to acquire data. This instrumentation uses low current and has minimal to no potential impact on the environment or persons.

Geophysical Procedures

Seismic Refraction Surveys

The seismic refraction surveys involve the placing of 24 small geophones on the ground in a more or less straight line at equal spacing. The geophones have a one-inch-long prong that is forced into the ground (usually by pushing with one's boot) to hold the

geophone firmly. This allows good contact with the ground so that shock waves travelling through the ground are transmitted efficiently from the ground to the potentiometers inside the geophone. The geophones are connected to a specialized cable that carries the geophone signal to a seismograph unit. Shock waves are created by slamming (human powered) a 12- to 16-pound sledge-hammer against an 8 inch square, ¾ inch thick steel plate placed on at least seven different locations along the refraction line. A small triggering device attached to the side of the hammer head registers the moment of impact with the plate and transmits a signal that is sent along a small "shot" wire to the seismograph unit, which begins recording. If the hammer and plate prove insufficient energy to cover the entire survey line, a shock-producing device involving a 350- to 500-grain blank shotgun shell or small explosive charge is inserted up to two feet into the ground and tamped.

Electrical Resistivity Surveys

At regularly spaced intervals along the survey line, copper stakes are driven into the ground at the proper electrode spacing and connected to the multi-electrode cables. The cables are then connected to the ARES II unit in preparation for collecting and recording data. A contrast resistance test is performed for each array before collecting resistivity measurements and adjustments made to the connections as needed. A low current is then applied to the ground across the line and voltage measured at each of the copper stakes.

Post Geophysical Exploration Clean-Up Operations

Only very minimal disturbance is anticipated to result from the proposed geophysical surveys. After the completion of each geophysical survey line any ground disturbance resulting from the placement of geophones or copper stakes, the striking of refraction hammer plates or hand augering for downhole shotgun or explosive sources will be backfilled sufficient to minimize visual impact and create an even walking surface where appropriate. Any vegetative debris generated by brushing will be laid back onto the ground surface in the cleared area to minimize any visual impacts and erosion potential as appropriate.

2. Geotechnical Drilling

To characterize the geotechnical subsurface conditions in the vicinity of project structures, we propose to drill up to twenty-two (22) borings (see Table 1). Mud-rotary drilling methods will be utilized for the geotechnical borings to support geotechnical sampling and the installation of instrumentation. We estimate the maximum depth for the 4.75-inch diameter, vertical borings will be approximately 200 feet below ground surface (bgs). Solid PVC casings will be installed in two of the borings to support PS suspension logging before being destroyed in accordance with Humboldt County Environmental Health agency requirements.

Caltrans Drilling Services or an approved drilling subcontractor will perform drilling

operations at all geotechnical boring locations. We anticipate that the advancement, sampling, and geophysical casing installations for each of the borings will take an average of approximately 4 days to complete. The total drilling time for this phase of the exploration is estimated to take approximately 88 working days (approximately 18 weeks).

Depending on location, the proposed borings will be advanced through the existing bridge deck, highway pavement surface, median strip, or vegetated area adjacent to the approach embankments. We anticipate that most borings will require traffic control, either continuously or to support entrance and exit from the drill locations.

Additional mitigation measures for geotechnical work developed by Caltrans North Region Environmental will be followed. These additional measures are included as Appendix I.

Table 1 – Borehole Summary List

Boring #	Location	Approximate Coordinates	Design Purpose	Target Depth (feet)	Drilling Method
B-1	Grassy Target Landscaping Area West of Southern Approach Embankment	40.805187°/-124.142723°	Bike Path Embankment	100	Mud-Rotary
B-2	Grassy Area Adjacent to Trail, Between Bridges	40.805037°/-124.141929°	Bridge Foundation	200	Mud-Rotary
B-3	Grassy Area Adjacent to Trail, South of Bridges	40.804683°/-124.142261°	Bridge Foundation	200	Mud-Rotary
B-4	Grassy Median Adjacent to North Abutment	40.805693°/ -124.138974°	Bridge Foundation	200	Mud-Rotary
B-5	Coastal Brushy Area South of Northern Approach	40.805491°/-124.138343°	Bridge Foundation	200	Mud-Rotary
B-6	Grassy Median Adjacent to South Abutment	40.804936° /-124.142455°	Bridge Foundation	200	Mud-Rotary
B-7	Through Outer Lane Northbound Bridge Deck	40.805043°/-124.141347°	Bridge Foundation	200	Mud-Rotary
B-8	Through Outer Lane, Southbound Bridge Deck	40.805376°/-124.140987°	Bridge Foundation	200	Mud-Rotary
B-9	Through Outer Lane Northbound Bridge Deck	40.805232°/-124.140423°	Bride Foundation	200	Mud-Rotary
B-10	Through Outer Lane, Southbound Bridge Deck	40.805571°/-124.140041°	Bridge Foundation	200	Mud-Rotary
B-11	Through Outer Lane Northbound Bridge Deck	40.805433°/-124.139474°	Bridge Foundation	200	Mud-Rotary

B-12	Through Outer Lane Northbound Bridge Deck	40.805132°/-124.140879°	Bridge Foundation	200	Mud-Rotary
B-13	Through Outer Lane, Southbound Bridge Deck	40.805277°/-124.141441°	Bridge Foundation	200	Mud-Rotary
B-14	Grassy Area Adjacent to Trail, North of Bridges	40.805221°/ -124.141936°	Bridge Foundation	200	Mud-Rotary
B-15	Through Outer Lane, Southbound Bridge Deck	40.805486°/ -124.140502°	Bridge Foundation	200	Mud-Rotary
B-16	Through Outer Lane Northbound Bridge Deck	40.805343°/ -124.139946°	Bridge Foundation	200	Mud-Rotary
B-17	Through Outer Lane, Southbound Bridge Deck	40.805694°/-124.139551°	Bridge Foundation	200	Mud-Rotary
B-18	Northbound 101 Shoulder South of 6th Street Exit	40.804032°/-124.145214°	Box Culvert/ Bridge	100	Mud-Rotary
B-19	6th Street, Southbound Lane	40.803848°/-124.145130°	Box Culvert/ Bridge	100	Mud-Rotary
B-20	Northbound 101 Shoulder North of 6th Street Exit	40.804226°/-124.144403°	Retaining Wall	100	Mud-Rotary
B-21	Northbound 101 Shoulder North of 6th Street Exit	40.804397°/-124.143654°	Retaining Wall	100	Mud-Rotary
B-22	Northbound 101 Shoulder North of 6th Street Exit	40.804564°/-124.142894°	Retaining Wall	100	Mud-Rotary

Drilling Equipment

The following equipment will be required to support the geotechnical drilling operations: a track or truck-mounted drill rig equipped with a Standard Penetration Test (SPT) hammer, a water truck, crew cab, and a geologist/engineer's vehicle. In addition, the following equipment may be utilized on an as needed basis, to protect ground surfaces: portable ground protection mats to aid vehicular access and protect soft ground surfaces, visqueen and straw wattle to construct appropriate BMP structures to contain any drilling fluid or impacted water for clean-up.

The SPT is an in-situ dynamic penetration test designed to provide geotechnical engineering properties of the soil. The test uses a thick-walled spilt-spoon sample tube with an outside diameter of two inches, and inside diameter of 1.4 inches and a length of approximately 25.6 inches. This tube is driven into the ground at the desired sampling interval in the borehole by blows from a 140-pound slide hammer, free falling a distance of 30-inches. The tube is driven 18-inches into the ground or until refusal is achieved with the hammer.

The Caltrans District 4 Environmental Engineering Branch has performed a study to characterize the noise impacts typically produced by a Mobile B-47 drill rig, equipped with an SPT hammer. The table below summarizes, the results of the noise study, presenting noise levels at given distances measured during both drilling and SPT

sampling operations.

Table 2 – SPT Noise Impacts

Distance From Rig (ft)	Duration (minutes)	Drilling Noise Levels (dBA)	Duration (minutes)	SPT Hammer (dBA)
5	2:28	82.1	1:00	93.4
25	2:30	73.3	1:00	79.9
50	2:53	69.0	1:00	72.8
75	2:38	65.5	1:00	69.3
100	3:00	64.2	1:00	No Data

Drilling Procedures

To obtain quality soil and rock samples at the depths needed, advancement of the geotechnical test borings will require the use of the mud rotary drilling system. The system requires the use of drilling fluid to keep the borehole open, bring cuttings to the surface, and lubricate and cool the drill bit.

Drilling fluid is made up of water alone, or water mixed with a thickening agent such as bentonite clay and/or a liquid polymer. The drilling fluid is fully contained and recirculated through a closed system using an 8-inch outer steel casing, 94-mm drill rod, and mud tank. The mud tank will be positioned on the ground surface adjacent to the drill rig and will serve as a settlement tank for soil cuttings. The cuttings are periodically removed and placed in 55-gallon steel drums. The steel drums will be removed from the job site and transferred to an appropriate fenced staging area. From the staging area, the drums will be tested and taken to an appropriate landfill site as specified through the Mud Disposal Contract managed by the Office of Drilling Services. Holes designated to receive geophysical casings will have a solid, 4-inch diameter PVC pipe installed and the annular space filled with bentonite/cement grout placed by tremmy methods. Traffic-proof well covers will be installed at the top of boreholes in which geophysical casing will be installed with quick setting Portland cement to allow access.

Eleven of the proposed borings will be drilled into vegetated areas in the median, shoulder or at the base of the existing approach embankments. Access of equipment to and drilling at these locations is expected to generate some level of ground and vegetation disturbance. The proposed access paths and drilling work area have been included in the Layout Plan Sheets. We anticipate that access to and establishment of a work area at B-3, B-5, B-21, and B-22 will require some level of brushing of coastal scrub.

Ten of the proposed borings will be drilled through the existing northbound and southbound Eureka Slough Bridge decks. In general, the same type of equipment and equipment set-up discussed in the onshore drilling section of this plan will be required for the bridge deck drilling.

Drilling through the bridge deck within the slough channel will be done using the self-casing wire line rotary wash system exclusively. To facilitate drilling, first the bridge deck will be core drilled utilizing a 5-inch diameter drill bit, taking care to first identify and avoid all critical bridge structures and reinforcing (with assistance from the Area Bridge Maintenance Engineer). Second, a 5-inch outer casing will be installed through the deck and extended to below the ground surface within the estuary channel sufficiently (approximately 10 to 15-feet) to insure containment and recirculation of the drilling fluids. Once the casing is in place, drill pipe will be installed inside the outer casing and the drilling will proceed to the planned boring depth.

Precautions during drilling will be employed using Best Management Practices (BMP) to mitigate excessive noise, possible equipment leaks, or drilling fluid spillage. These may include plastic tarps, absorption mats, and jute waddles. When drilling within the slough channel, potential leakage at the casing mud-line contact will be monitored. If leakage is detected the wet drilling will be stopped and the casing will be advanced by dry drilling to a depth at which leakage has stopped (adequately sealed off).

In the event of a spill or leak, the District 1 Spill Communication Plan will be followed, which outlines the process of spill response and notifications to appropriate Agencies & Entities. The District 1 Spill Communication Plan is included as Appendix II.

After completion of drilling, the drilled hole in the bridge deck will be back filled with concrete. The procedure involves placing a steel plate with wires attached under the bridge deck to cover the drilled hole. The wires are brough up through the drilled hole and attached to two short pieces of rebar that lay on the bridge deck beside the drill hole. A concrete mix is then poured/placed in the drilled hole to bring the level of the concrete to the elevation of the bridge deck. After the concrete cures, the wires are cut off at the bridge deck surface. The steel place is essentially permanently secured to the underside of the bridge deck.

Photo 2 & 3. Drilling though a bridge deck into an actively flowing river

Post-Drilling Clean-up Operations

After the completion of each geotechnical boring, soil cuttings and drilling fluid generated by the operation will be pumped and/or shoveled into 55-gallon drums for hazwaste characterization and disposal. Any cuttings and/or drilling fluid inadvertently spilled onto the ground during drilling operations will similarly be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean pavement surfaces to prevent contamination of future storm-water or impacts to public safety, a minimal amount will be used and as much of the impacted water captured as practical. Any areas of ground disturbance created during off-road drilling activities will be mitigated with appropriate BMPs to prevent erosion and storm-water pollution.

Borings not designated to receive a geophysical casing will be backfilled using neat cement grout placed at the base of the excavation by tremmy in accordance with LEA requirements. Any holes in the road surface will be patched with fast setting cement. Any holes in the bridge deck will be back filled as previously described.

3. PS Suspension Logging

Downhole P-S suspension logging will be potentially conducted on two borings, B-2 and

B-4. This will allow direct measurement of the compression wave (P) and shear wave (S) velocities of the surrounding rock and soils units in the subsurface to support a site-specific dynamic ground response analysis, as well as refinement of seismic refraction surveys and liquefaction analysis.

Additional mitigation measures for geotechnical work developed by Caltrans North Region Environmental will be followed. These additional measures are included as Appendix I.

Equipment

Logging equipment will consist of an approximately 19-foot-long probe, aluminum tripod with pully, winch, armored conductor cable, and logger/recorder. The probe can be disassembled into sections and all equipment can be transported to and from the site by conventional vehicles and around the site by foot.

Procedures

The probe is lowered to the bottom of the fluid filled casing using the tripod, pully and winch system and returned to the surface, stopping at set intervals to collect data. The data will be recorded on the data logger and returned to the office for further processing and analysis

Clean-Up Procedures

No disturbance to ground or vegetation is anticipated as part of the downhole P-S suspension logging. When analysis of the collected data confirms that no additional downhole geophysics are required, the geophysical casing and borehole will be destroyed in accordance with Humboldt County Environmental Health Department guidelines.

Right of Way

Most of the proposed drilling and geophysical sites are located within the Caltrans Right of Way. We anticipate that access to or work on Borings B-1, B-2, B-5, B-14 and B-19 as well as geophysics lines SL-1, SL-2, and SL-4 will enter into private and public lands outside the Caltrans Right of Way. We anticipate that access agreements will need to be obtained from lands owners and county parks prior to access improvements and exploration.

Permitting

We anticipate the proposed exploration work will, at a minimum, require LEA Boring

Permits, but that other environmental permits as well as cultural and archeologic clearances may be required.

Season & Hours of Work

As indicated above, we anticipate the geotechnical phase of the exploration work to take approximately 20 weeks. This length of time may be reduced by utilizing multiple drill rigs and by conducting portions of the geophysical and drilling activities concurrently. Based on input from District 1 Work Zone Operations, the borings requiring a lane closure (i.e. the 10 borings conducted within the bridge deck) will need to be conducted at night.

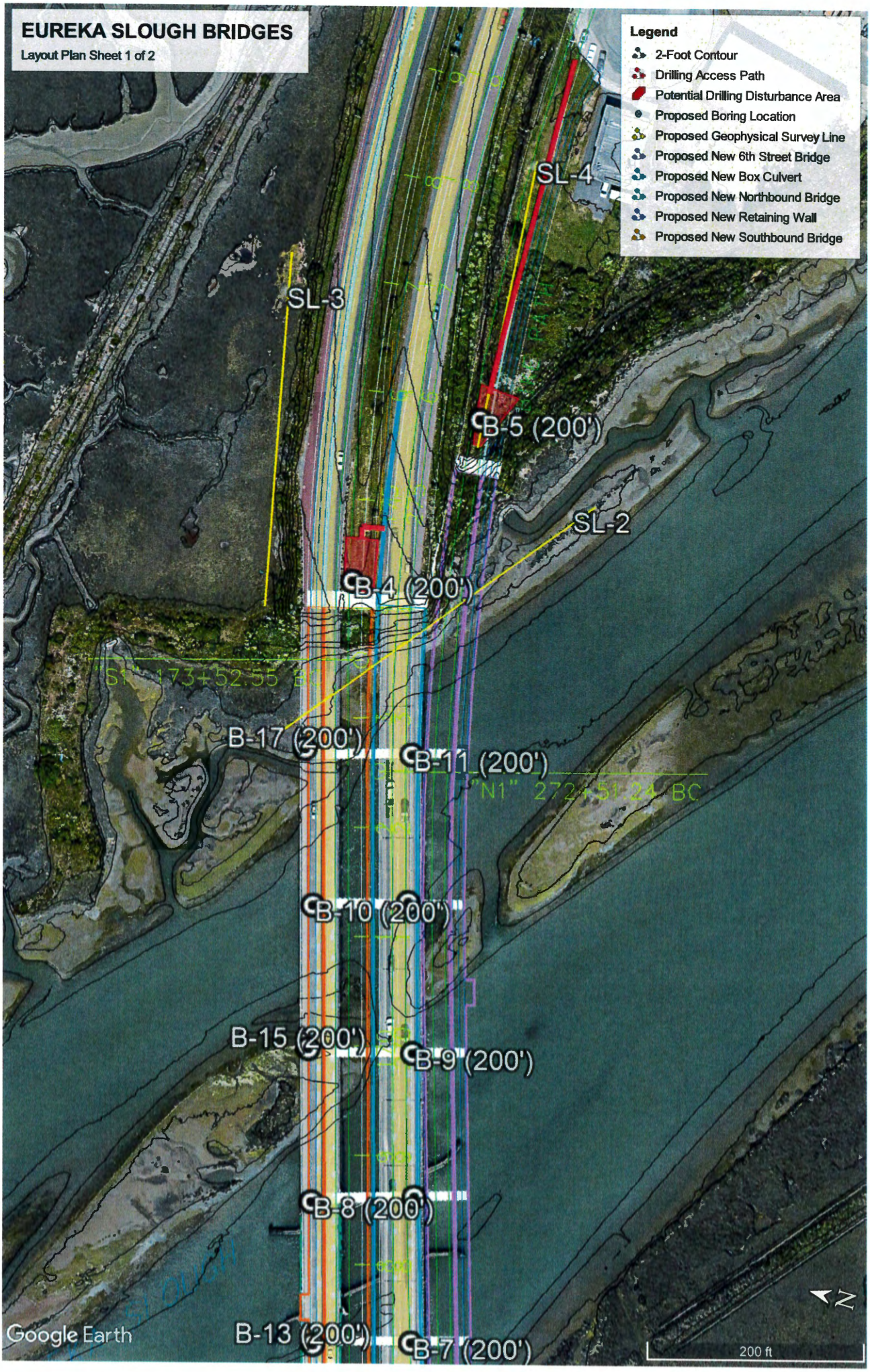
Work window restrictions developed by Caltrans North Region Environmental (see Appendix III) will be followed for all exploration locations.

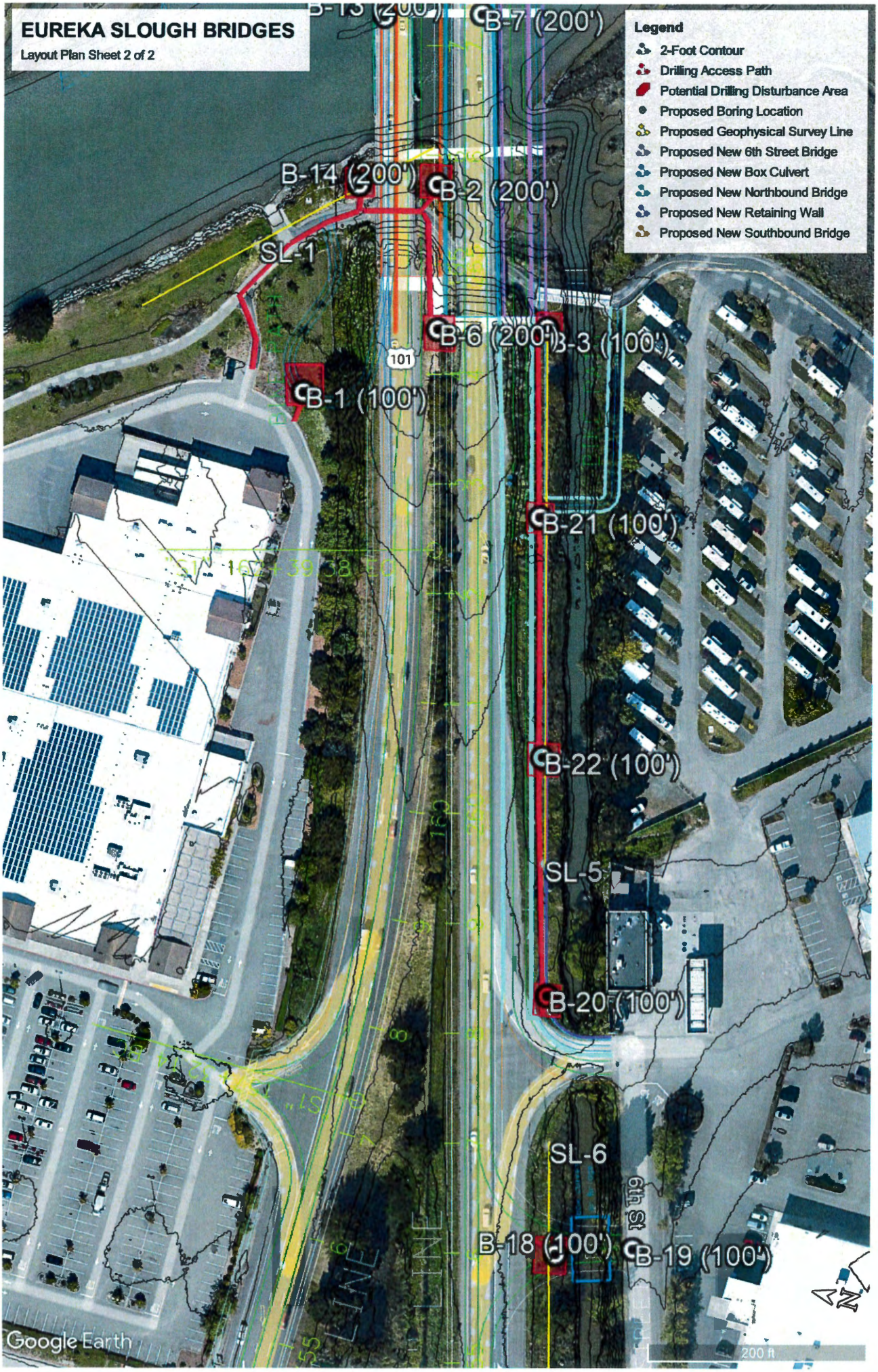
Questions relating this report should be directed to Eric Wilson at 916-215-9572 or Lianna Winkler-Prins at 916-952-9140.

Attachment: Layout Plan Sheets

Appendices:

I. Additional Mitigation Measures for Geotechnical Work
II. District 1 Spill Communication Plan
III. Geotechnical Work Window Restrictions


EUREKA SLOUGH BRIDGES
Layout Plan Sheet 1 of 2
Legend
2-Foot Contour
Drilling Access Path
Potential Drilling Disturbance Area
Proposed Boring Location
Proposed Geophysical Survey Line
Proposed New 6th Street Bridge
Proposed New Box Culvert
Proposed New Northbound Bridge
Proposed New Retaining Wall
Proposed New Southbound Bridge
SL-4
SL-3
SL-2
B-5 (200')
B-4 (200')
B-17 (200')
B-11 (200')
B-10 (200')
B-15 (200')
B-9 (200')
B-8 (200')
B-13 (200')
B-7 (200')
Google Earth
200 ft


EUREKA SLOUGH BRIDGES
Layout Plan Sheet 2 of 2
Legend
2-Foot Contour
Drilling Access Path
Potential Drilling Disturbance Area
Proposed Boring Location
Proposed Geophysical Survey Line
Proposed New 6th Street Bridge
Proposed New Box Culvert
Proposed New Northbound Bridge
Proposed New Retaining Wall
Proposed New Southbound Bridge
B-7 (200')
B-14 (200')
B-2 (200')
SL-1
B-6 (200')
B-3 (100')
101
B-1 (100')
B-21 (100')
B-22 (100')
SL-5
B-20 (100')
SL-6
6th St
B-18 (100')
B-19 (100')
Google Earth
200 ft

Appendix I. Standard Measures and Best Management Practices

Biological Resources

BR-1: General

Before start of work, as required by permit or consultation conditions, a Caltrans biologist or ECL would meet with the site investigation team to brief them on environmental permit conditions and requirements relative to each stage of the proposed project, including, but not limited to, work windows, drilling site management, and how to identify and report regulated species within the project areas.

BR-2: Animal Species

- To protect migratory and nongame birds (occupied nests and eggs), if possible, vegetation removal would be limited to the period outside of the bird breeding season (removal would occur between September 16 and January 31). If vegetation removal is required during the bird breeding season, a nesting bird survey would be conducted by a qualified biologist within one week prior to vegetation removal. If an active nest is located, the biologist would coordinate with CDFW to establish appropriate species-specific buffer(s) and any monitoring requirements. The buffer(s) would be delineated around each active nest and construction activities would be excluded from these areas until birds have fledged, or the nest is determined to be unoccupied.

- Artificial night lighting may be required. To reduce potential disturbance to sensitive resources, lighting would be temporary, and directed specifically on the portion of the work area actively under construction. Use of artificial lighting would be limited to Cal/OSHA work area lighting requirements.

- A Limited Operating Period would be observed, whereby all in-stream work below ordinary high water (OHW) would be restricted to the period between June 15 and October 15 to protect water quality and vulnerable life stages of sensitive fish species.

BR-3: Invasive Species

All equipment would be thoroughly cleaned of all dirt and vegetation prior to entering the job site to prevent importing invasive non-native species. Project personnel would adhere to the latest version of the *California Department of Fish and Wildlife Aquatic Invasive Species Cleaning/Decontamination Protocol (Northern Region)* for all field gear and equipment in contact with water.

BR-4: Rare Plant Species

Prior to the start of work, flagging would be installed around Humboldt Bay owl's clover and Point Reyes bird's-beak occurrences that are within the ESL and no drilling or heavy equipment would occur in these areas. Geophysical surveys consisting of foot traffic to lay cables, geophones, and strike plates would be allowed in or adjacent to occurrences.

Additional Measures to Protect Aquatic Resources

- Before geotechnical activities begin, the project environmental coordinator or biologist would discuss the implementation of the required BMPs with the site investigation team and identify and document environmentally sensitive areas and potential occurrence of listed species.
- In-stream geotechnical drilling would be restricted to the period between June 15 and October 15 to protect water quality and vulnerable life stages of sensitive fish species. Geotechnical drilling restricted to this period includes drilling through the bridge deck into the slough channel.
- When geotechnical drilling takes place, drilling fluid would be made up of water, or water mixed with bentonite clay without additives. Drilling would be conducted inside a casing so that all spoils are recoverable in a collection structure. All drilling fluids and materials would be self-contained and removed from the site after use, in accordance with Caltrans Drilling Services Quality Management Plan (Caltrans 2019).
- The boring holes would be backfilled with cement. To prevent contamination of sensitive areas with cement, for those boring holes in the slough channel, the top 20 feet would be filled with a non-toxic bentonite clay mixture. For those boring holes on land or in wetlands, the top 5 feet would be filled with native soils retained from the holes.

- The only equipment that would be parked or driven in wetlands would be a track-mounted drill rig. Temporary wetland protection mats would be used to prevent permanent damage and minimize temporary damage to wetlands from the track-mounted drill rig.
- With the exception of the track-mounted drill rig, no equipment parking or storage would occur within wetlands or special status plant communities.
- BMPs will be implemented as appropriate to control on-site and offsite releases from geotechnical drilling operations. In the event of a fluid spill, drilling will cease immediately to allow for containment and clean-up. The District 1 Spill Communication Plan will be followed, which outlines the process of spill response and notification of appropriate agencies and entities.
- Precautions during drilling will be employed to mitigate any possible equipment leaks or drilling fluid spillage. These may include, plastic tarps, absorption mats, and straw wattles where appropriate. Where risk exists of drilling fluid being sprayed or otherwise ejected beyond the controlled work zone, into an adjacent wetland area, removable barriers, such as plastic sheeting would be deployed.
- When drilling within the slough channel, potential leakage at the casing mud-line contact will be monitored. If leakage is detected, wet drilling will be stopped and the casing will be advanced by dry drilling to a depth at which leakage has stopped (adequately sealed off).
- Equipment would be inspected on a daily basis for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other deleterious materials prior to operating equipment.
- Maintenance and fueling of equipment and vehicles would occur at least 15 meters from the Ordinary High-Water Line (OHWL) or the edge of sensitive habitats (*e.g.*, wetlands).
- Vegetation would be mowed or trimmed to a height greater than 4 inches. Existing vegetated areas would be maintained to the maximum extent practicable.

Appendix II

Spill Communication Plan

Caltrans Construction-District 1

A. Introduction:

The purpose of this Plan is to ensure prompt notifications are made to appropriate **Agencies & Entities** who oversee Jurisdictional Waters, in the event of an unpermitted release of a deleterious substance to Jurisdictional Waters.

This Plan applies to Caltrans and its agents who perform construction project work in District 1 and illustrates how spills and leaks of potential pollutants are to be reported. On an annual basis, this Plan will be utilized to educate and train all project related personnel via the following mechanisms: specific tail-gate safety meetings; onsite project related meetings; and other relevant training opportunities.

If an unpermitted discharge of a substance deleterious to aquatic life or other natural resources enters or could potentially enter Jurisdictional Waters, immediately after ensuring all safety topics are addressed, staff at the project site shall notify the appropriate **Agencies & Entities** listed in this document as soon as possible. Additional reporting requirements may be necessary, as described and defined by project-specific permits. If it is unknown whether a discharge is permitted, onsite field staff shall conservatively assume that it is not. Likewise, if it is unknown whether a substance is deleterious, it shall be conservatively assumed that it is, and correspondingly reported as such. The response, notification procedures and requirements set forth in this Plan, along with directions set forth under Section 13-4, "Job Site Management," of the Standard Specifications shall apply to all spills, including ones initially considered *de minimus*.

B. Spill Response:

The primary focus during the initial phase of any spill response is to ensure the safety of all, including the traveling public; any first responders; and all onsite Contractor and Caltrans staff. If a significant or hazardous spill occurs, it may be necessary to stop all work and evacuate the area near the spill during the initial response, prior to performing notifications.

After ensuring appropriate safety precautions have been implemented, field staff at the project site shall immediately collect the information under Section "D" below and ensure notifications are made to the following: **Resident Engineer, Water Pollution Control Manager**, **Environmental Construction Liaison**, and that all appropriate **Agencies & Entities** (*see other side of this document for contact information*).

If safe to do so, all available onsite Caltrans and Contractor personnel shall immediately begin working to contain and minimize impacts. Staff are to cordon off the affected spill area and clear everyone except for those who are necessary to assist with the response, cleanup and notification process. Once determined safe to do so, onsite staff are to immediately mobilize all available project staff, materials, and equipment necessary to begin and assist in the cleanup efforts.

Under certain situations, when a significant or hazardous spill occurs in critical or unique locations, other agencies may take over responsibility for directing the subsequent response and cleanup, such as for most oil spills within navigable waters where the United States Coast Guard would take over directing the response and cleanup efforts. Such unique situations will be clearly outlined in project specific permits, with appropriate contacts and directions.

C. Notification of Agencies & Entities:

As outlined in Section "B" above, if a spill occurs and all safety precautions have been evaluated, onsite field staff shall notify appropriate Agencies & Entities as soon as possible. Additionally, the Caltrans Resident Engineer or their delegated representative will follow up with all Agencies & Entities to ensure proper processes are being implemented. If there is no cell-phone service or other means of quickly notifying all appropriate contacts at the project site, all practical attempts to make such notifications shall be required, including sending non-critical staff who aren't necessary for the initial response, to a nearby location to make all required notifications.

Notifications should be provided to:

- 911 **(For Significant or Hazardous spills only)**
- California Office of Emergency Services (CalOES) (800) 852-7550
- Department of Fish and Wildlife (DFW) Cal-TIP (888) 334-2258
- North Coast Regional Water Quality Control Board (707) 576-2200 **(DN, HUM, MEN)**
- Central Valley Regional Water Quality Control Board (916) 464-3291 **(LAK)**

Additional notifications may be required based on location and type of spill:

- Yurok Tribe (707) 482-1822 **(DN-101 PM 2.07/8.76, DN-169, HUM-96 PM 22.75/25.1, HUM-169)**
- Hoopa Tribe (530) 625-4211 **(HUM-96 PM 7.8/22.75)**
- Resighini Tribe (707) 482-2431 **(DN-101 PM 1 to 2.07)**
- National Marine Fisheries Service (NMFS) - Santa Rosa Office (707) 575-6057
- United States Coast Guard (800) 424-8802
- National Response Center at (800) 424-8802 regarding spills of Federal-reportable quantities, as outlined under 40 CFR 110, 117, and 302
- California Highway Patrol – if appropriate or per VC Section 23112.5 **(Arcata 707-822-5981; Garberville 707-923-2155; Ukiah 707-467-4420; Clearlake 707-279-0103; Williams 530-473-2821; Crescent City 707-464-3117)**

Every attempt should be made to speak to a person instead of leaving a voicemail. Documentation of the following shall be performed: who was spoken to; when the notification was performed; and the contents if a message was required. All documentation relating to the incident and notifications shall be retained and become part of the Project Files.

D. Information to provide

1. The type of substance/material released and the initial assumption relating to the cause or trigger of the release-
2. The estimated volume/amount of substance/material released-
3. The estimated potential harm to aquatic life and/or known natural resources in the project area-
4. The estimated time relating to the duration of the release, along with estimated extend of potential impacts -
5. The location and physical extent of the release occurred (include State Route number, County, Mile Marker; adjacent known landmarks; adjacent waterbody/watershed names; and physical address if practical-
6. The current and planned response to contain and cleanup the release, along with other relevant information.

Spill Communication Plan

Caltrans Construction-District 1

Effective January 28, 2019

If Spill Occurs: Onsite Staff Shall Immediately Initiate Containment, Cleanup & Perform Notifications

(See Section 13 of Std. Specs. for spill definitions)

Is there cell-phone signal onsite?

No

Send Non-critical person to call Agencies & Entities, RE, WPC Manager, and ECL

Yes

Agencies & Entities

(Contact Information)

- 911 (for significant and hazardous spills)
- CalOES (800) 852-7550
- DFW CAL-TIP (888) 334-2258
- National Response Center (800) 424-8802

See other side (based on location)

- NCRWQCB (707) 576-2220
- CVRWQCB (916) 464-3291
- Yurok Tribe (707) 482-1822
- Hoopa Tribe (530) 625-4211
- Resighini Tribe (707) 482-2431
- NMFS (707) 575-6057
- United States Coast Guard (800) 424-8802
- California Highway Patrol (see other side for phone #)
- Cal OES (see other side for phone #)

Information to Provide Agencies & Entities (Section "D"):

- The nature of substance/material released-
- Estimated volume/amount released-
- Estimated potential harm to aquatic life & natural resources-
- The duration of the release-
- The exact location and extent of the release -
- Potential cause of the release-
- Current and planned response efforts-
- Any other relevant information -

Onsite Field Staff to Immediately Notify the RE, WPC Manager, ECL, and all appropriate Agencies & Entities

RE or delegate to follow up with Agencies & Entities, After Initial Notifications Were Made

Appendix III. Geotechnical Investigations Restrictions

LOCATION	Habitat type	JAN	FEB	MAR	APR	MAY	JUNE 1-15	Permits Received Target Date 6/23 JUNE 16-30	JULY	AUG 1-15	AUG 16-31	SEPT	OCT	NOV	DEC	RESTRICTION NOTES
SL-3	wetland															CT biologist will flag rare plants prior, avoid trampling
B-5	upland															Nesting bird survey prior to vegetation clearing
SL-4	upland															Nesting bird survey prior to vegetation clearing
B-4	upland															
SL-2	mud flat															
B-17	mud flat															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-11	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-10	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-15	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-16	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-9	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-8	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-13	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-7	tidal channel															Boring June 15-Oct 15 to avoid impacts to sensitive fish species
B-14	upland															
B-2	upland															
SL-1	upland															
B-6	upland															
B-1	upland															
B-3	wetland															Avoid rare plants, CT biologist will flag prior. Use mats to protect wetlands
B-21	wetland															Avoid rare plants, CT biologist will flag prior. Use mats to protect wetlands
B-22	wetland															Avoid rare plants, CT biologist will flag prior. Use mats to protect wetlands
SL-5	wetland															Avoid rare plants, CT biologist will flag prior. Use mats to protect wetlands
B-20	upland															
SL-6	upland															
B-18	wetland															Avoid rare plants, CT biologist will flag prior. Use mats to protect wetlands
B-19	upland															

	No Restrictions
	No Restriction with Measures
	Restricted

APPENDIX B. USFWS Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
Phone: (707) 822-7201 Fax: (707) 822-8411

In Reply Refer To:
Project Code: 2023-0016031
Project Name: Eureka Slough Bridge 01-0F200

January 26, 2023

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
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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".

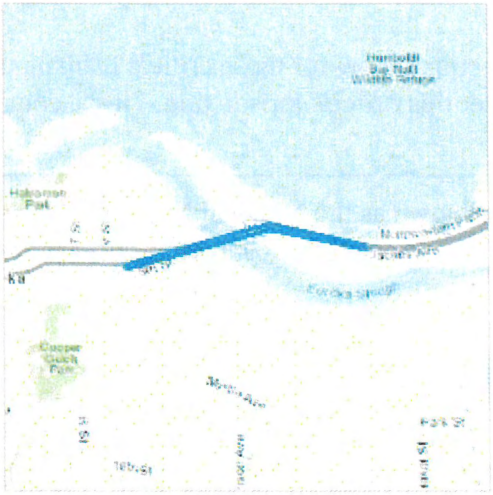
This species list is provided by:

Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
(707) 822-7201

Project Summary

Project Code: 2023-0016031
Project Name: Eureka Slough Bridge 01-0F200
Project Type: Subsurface Exploration - Non Energy Materials
Project Description: Geotechnical exploration for ESB
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.80484415123496,-124.14250373840332,14z



Counties: Humboldt County, California

Endangered Species Act Species

There is a total of 9 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
Pacific Marten, Coastal Distinct Population Segment *Martes caurina* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9081	Threatened

Birds

NAME	STATUS
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	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

Fishes

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

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

Flowering Plants

NAME	STATUS
Western Lily *Lilium occidentale*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/998

Critical habitats

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

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

The following FWS National Wildlife Refuge Lands and Fish Hatcheries lie fully or partially within your project area:

FACILITY NAME	ACRES
HUMBOLDT BAY NATIONAL WILDLIFE REFUGE https://www.fws.gov/refuges/profiles/index.cfm?id=81590	3,349.154

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Allen's Hummingbird *Selasphorus sasin* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9637	Breeds Feb 1 to Jul 15
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Jan 1 to Sep 30

NAME	BREEDING SEASON
Black Oystercatcher *Haematopus bachmani* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9591	Breeds Apr 15 to Oct 31
Black Swift *Cypseloides niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8878	Breeds Jun 15 to Sep 10
Black Turnstone *Arenaria melanocephala* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Evening Grosbeak *Coccothraustes vespertinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Olive-sided Flycatcher *Contopus cooperi* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds Apr 15 to Jul 15

NAME	BREEDING SEASON
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds Jun 1 to Aug 10
Western Grebe *aechmophorus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wrentit *Chamaea fasciata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 10

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (▒)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.

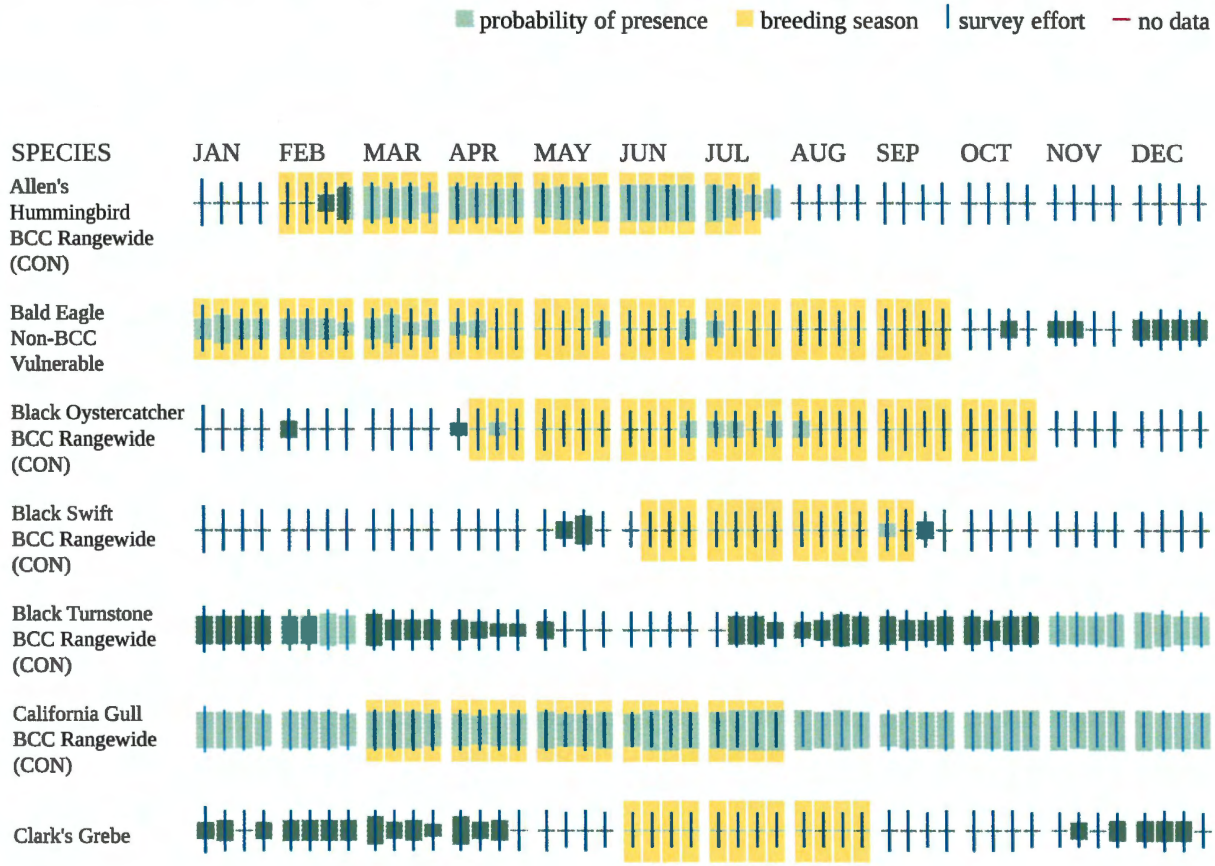
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPaC User Contact Information

Agency: California Department of Transportation District 1
Name: Christine Hamilton
Address: 1656 Union St
City: Eureka
State: CA
Zip: 95501
Email christine.hamilton@dot.ca.gov
Phone: 7078155917

APPENDIX C. NMFS Species List

Quad Name **Eureka**
Quad Number **40124-G2**

ESA Anadromous Fish

SONCC Coho ESU (T) - **X**
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) - **X**
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) - **X**
CCC Steelhead DPS (T) -
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 - **X**
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat - **X**
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat - **X**
CCC Steelhead Critical Habitat -
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) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

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

ESA Whales

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

ESA Pinnipeds

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

Essential Fish Habitat

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

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans - X

MMPA Pinnipeds - X

APPENDIX D. CDFW/CNDDB Species List

Selected Elements by Element Code

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Eureka (4012472) OR Tyee City (4012482) OR Arcata North (4012481) OR Arcata South (4012471) OR Fields Landing (4012462) OR Cannibal Island (4012463))

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAJ01020	***Rhyacotriton variegatus*** southern torrent salamander	None	None	G3G4	S2S3	SSC
AAABA01010	***Ascaphus truei*** Pacific tailed frog	None	None	G4	S3S4	SSC
AAABH01021	***Rana aurora*** northern red-legged frog	None	None	G4	S3	SSC
AAABH01051	***Rana boylii pop. 1*** foothill yellow-legged frog - north coast DPS	None	None	G3TNRQ	S4	SSC
ABNFD01020	***Nannopterum auritum*** double-crested cormorant	None	None	G5	S4	WL
ABNGA04010	***Ardea herodias*** great blue heron	None	None	G5	S4	
ABNGA04040	***Ardea alba*** great egret	None	None	G5	S4	
ABNGA06030	***Egretta thula*** snowy egret	None	None	G5	S4	
ABNGA11010	***Nycticorax nycticorax*** black-crowned night heron	None	None	G5	S4	
ABNKC01010	***Pandion haliaetus*** osprey	None	None	G5	S4	WL
ABNKC06010	***Elanus leucurus*** white-tailed kite	None	None	G5	S3S4	FP
ABNKC10010	***Haliaeetus leucocephalus*** bald eagle	Delisted	Endangered	G5	S3	FP
ABNKC11011	***Circus hudsonius*** northern harrier	None	None	G5	S3	SSC
ABNKC12020	***Accipiter striatus*** sharp-shinned hawk	None	None	G5	S4	WL
ABNKD06071	***Falco peregrinus anatum*** American peregrine falcon	Delisted	Delisted	G4T4	S3S4	FP
ABNME01010	***Coturnicops noveboracensis*** yellow rail	None	None	G4	S1S2	SSC
ABNME05011	***Rallus obsoletus obsoletus*** California Ridgway's rail	Endangered	Endangered	G3T1	S1	FP
ABNNB03031	***Charadrius nivosus nivosus*** western snowy plover	Threatened	None	G3T3	S3	SSC
ABNNB03100	***Charadrius montanus*** mountain plover	None	None	G3	S2S3	SSC

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ABPAU08010	***Riparia riparia*** bank swallow	None	Threatened	G5	S2	
AFBAA02100	***Entosphenus tridentatus*** Pacific lamprey	None	None	G4	S3	SSC
AFBAA02180	***Lampetra richardsoni*** western brook lamprey	None	None	G4G5	S3S4	SSC
AFCAA01031	***Acipenser medirostris pop. 1*** green sturgeon - southern DPS	Threatened	None	G2T1	S1	
AFCHA02032	***Oncorhynchus kisutch pop. 2*** coho salmon - southern Oregon / northern California ESU	Threatened	Threatened	G5T2Q	S2	
AFCHA0208A	***Oncorhynchus clarkii clarkii*** coast cutthroat trout	None	None	G5T4	S3	SSC
AFCHA0209Q	***Oncorhynchus mykiss irideus pop. 16*** steelhead - northern California DPS	Threatened	None	G5T2T3Q	S1	
AFCHA0213P	***Oncorhynchus mykiss irideus pop. 48*** steelhead - northern California DPS summer-run	Threatened	Endangered	G5TNRQ	S2	
AFCHB03010	***Spirinchus thaleichthys*** longfin smelt	Candidate	Threatened	G5	S1	
AFCHB04010	***Thaleichthys pacificus*** eulachon	Threatened	None	G5	S1	
AFCQN04010	***Eucyclogobius newberryi*** tidewater goby	Endangered	None	G3	S3	
AMACC01070	***Myotis evotis*** long-eared myotis	None	None	G5	S3	
AMACC08010	***Corynorhinus townsendii*** Townsend's big-eared bat	None	None	G4	S2	SSC
AMAFA01017	***Aplodontia rufa humboldtiana*** Humboldt mountain beaver	None	None	G5TNR	SNR	
AMAFF23010	***Arborimus albipes*** white-footed vole	None	None	G3G4	S2	SSC
AMAFF23030	***Arborimus pomo*** Sonoma tree vole	None	None	G3	S3	SSC
AMAFJ01010	***Erethizon dorsatum*** North American porcupine	None	None	G5	S3	
AMAJF01020	***Pekania pennanti*** Fisher	None	None	G5	S2S3	SSC
ARAAD02030	***Emys marmorata*** western pond turtle	None	None	G3G4	S3	SSC
CTT21211CA	***Northern Foredune Grassland*** Northern Foredune Grassland	None	None	G1	S1.1	
CTT41100CA	***Coastal Terrace Prairie*** Coastal Terrace Prairie	None	None	G2	S2.1	

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
CTT52110CA	***Northern Coastal Salt Marsh*** Northern Coastal Salt Marsh	None	None	G3	S3.2	
CTT82110CA	***Sitka Spruce Forest*** Sitka Spruce Forest	None	None	G1	S1.1	
IICOL02101	***Cicindela hirticollis gravida*** sandy beach tiger beetle	None	None	G5T2	S2	
IICOL4L070	***Scaphinotus behrensi*** Behrens' snail-eating beetle	None	None	G2G4	S2S4	
IIHYM24252	***Bombus occidentalis*** western bumble bee	None	Candidate Endangered	G3	S1	
IIHYM24380	***Bombus caliginosus*** obscure bumble bee	None	None	G2G3	S1S2	
IIHYM24480	***Bombus crotchii*** Crotch bumble bee	None	Candidate Endangered	G2	S2	
IMBIV04220	***Anodonta californiensis*** California floater	None	None	G3Q	S2?	
IMBIV27020	***Margaritifera falcata*** western pearlshell	None	None	G4G5	S1S2	
NBMUS2W0U0	***Fissidens pauperculus*** minute pocket moss	None	None	G3?	S2	1B.2
NBMUS7N020	***Trichodon cylindricus*** cylindrical trichodon	None	None	G4G5	S2	2B.2
NLLEC5P420	***Usnea longissima*** Methuselah's beard lichen	None	None	G4	S4	4.2
NLT0042560	***Sulcaria spiralifera*** twisted horsehair lichen	None	None	G3G4	S2	1B.2
PDAST5L0C5	***Lasthenia californica ssp. macrantha*** perennial goldfields	None	None	G3T2	S2	1B.2
PDAST5N010	***Layia carnosa*** beach layia	Threatened	Endangered	G2	S2	1B.1
PDASTE5011	***Hesperevax sparsiflora var. brevifolia*** short-leaved evax	None	None	G4T3	S3	1B.2
PDBRA0K010	***Cardamine angulata*** seaside bittercress	None	None	G4G5	S3	2B.1
PDBRA160R0	***Erysimum menziesii*** Menzies' wallflower	Endangered	Endangered	G1	S1	1B.1
PDCAR0U1MC	***Silene scouleri ssp. scouleri*** Scouler's catchfly	None	None	G5T4T5	S2S3	2B.2
PDCAR0W032	***Spergularia canadensis var. occidentalis*** western sand-spurrey	None	None	G5T4	S1	2B.1
PDFAB0F7B2	***Astragalus pycnostachyus var. pycnostachyus*** coastal marsh milk-vetch	None	None	G2T2	S2	1B.2

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PDFAB250C0	***Lathyrus japonicus*** seaside pea	None	None	G5	S2	2B.1
PDFAB250P0	***Lathyrus palustris*** marsh pea	None	None	G5	S2	2B.2
PDMAL110E0	***Sidalcea malachroides*** maple-leaved checkerbloom	None	None	G3	S3	4.2
PDMAL110F9	***Sidalcea malviflora ssp. patula*** Siskiyou checkerbloom	None	None	G5T2	S2	1B.2
PDMAL110K9	***Sidalcea oregana ssp. eximia*** coast checkerbloom	None	None	G5T1	S1	1B.2
PDMON03030	***Monotropa uniflora*** ghost-pipe	None	None	G5	S2	2B.2
PDNYC010N4	***Abronia umbellata var. breviflora*** pink sand-verbena	None	None	G4G5T2	S2	1B.1
PDONA0C1K0	***Oenothera wolfii*** Wolf's evening-primrose	None	None	G2	S1	1B.1
PDPLM040B6	***Gilia capitata ssp. pacifica*** Pacific gilia	None	None	G5T3	S2	1B.2
PDPLM04130	***Gilia millefoliata*** dark-eyed gilia	None	None	G2	S2	1B.2
PDPOR05070	***Montia howellii*** Howell's montia	None	None	G3G4	S2	2B.2
PDSAX0N020	***Mitellastra caulescens*** leafy-stemmed mitrewort	None	None	G5	S4	4.2
PDSCR0D012	***Castilleja litoralis*** Oregon coast paintbrush	None	None	G3	S3	2B.2
PDSCR0D402	***Castilleja ambigua var. humboldtiensis*** Humboldt Bay owl's-clover	None	None	G4T2	S2	1B.2
PDSCR0H060	***Collinsia corymbosa*** round-headed collinsia	None	None	G1	S1	1B.2
PDSCR0J0C3	***Chloropyron maritimum ssp. palustre*** Point Reyes salty bird's-beak	None	None	G4?T2	S2	1B.2
PDVIO041G0	***Viola palustris*** alpine marsh violet	None	None	G5	S1S2	2B.2
PMCYP030X0	***Carex arcta*** northern clustered sedge	None	None	G5	S1	2B.2
PMCYP037E0	***Carex leptalea*** bristle-stalked sedge	None	None	G5	S1	2B.2
PMCYP037Y0	***Carex lyngbyei*** Lyngbye's sedge	None	None	G5	S3	2B.2
PMCYP03B20	***Carex praticola*** northern meadow sedge	None	None	G5	S2	2B.2

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
PMLIL0U0F0	***Erythronium revolutum*** coast fawn lily	None	None	G4G5	S3	2B.2
PMLIL1A0G0	***Lilium occidentale*** western lily	Endangered	Endangered	G1G2	S1	1B.1
PMPOA531L0	***Puccinellia pumila*** dwarf alkali grass	None	None	G5	SH	2B.2
PPLYC01080	***Lycopodium clavatum*** running-pine	None	None	G5	S3	4.1

Record Count: 86

APPENDIX E. CNPS Species List

CNPS Rare Plant Inventory

Search Results

49 matches found. Click on scientific name for details

Search Criteria: Quad is one of **[4012472:4012482:4012481:4012471:4012462:4012463]**

▲ COMMON NAME	SCIENTIFIC NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK
alpine marsh violet	*Viola palustris*	Violaceae	perennial rhizomatous herb	Mar-Aug	None	None	G5	S1S2	2B.2
American glehnia	*Glehnia littoralis* ssp. *leiocarpa*	Apiaceae	perennial herb	May-Aug	None	None	G5T5	S2S3	4.2
beach layia	*Layia carnosa*	Asteraceae	annual herb	Mar-Jul	FT	CE	G2	S2	1B.1
bristle-stalked sedge	*Carex leptalea*	Cyperaceae	perennial rhizomatous herb	Mar-Jul	None	None	G5	S1	2B.2
California pinefoot	*Pityopus californicus*	Ericaceae	perennial herb (achlorophyllous)	(Mar-Apr)May-Aug	None	None	G4G5	S4	4.2
coast checkerbloom	*Sidalcea oregana* ssp. *eximia*	Malvaceae	perennial herb	Jun-Aug	None	None	G5T1	S1	1B.2
coast fawn lily	*Erythronium revolutum*	Liliaceae	perennial bulbiferous herb	Mar-Jul(Aug)	None	None	G4G5	S3	2B.2
coastal marsh milk-vetch	*Astragalus pycnostachyus* var. *pycnostachyus*	Fabaceae	perennial herb	(Apr)Jun-Oct	None	None	G2T2	S2	1B.2
cylindrical trichodon	*Trichodon cylindricus*	Ditrichaceae	moss		None	None	G4G5	S2	2B.2
dark-eyed gilia	*Gilia millefoliata*	Polemoniaceae	annual herb	Apr-Jul	None	None	G2	S2	1B.2
dwarf alkali grass	*Puccinellia pumila*	Poaceae	perennial herb	Jul	None	None	G5	SH	2B.2
ghost-pipe	*Monotropa uniflora*	Ericaceae	perennial herb (achlorophyllous)	Jun-Aug(Sep)	None	None	G5	S2	2B.2
harlequin lotus	*Hosackia gracilis*	Fabaceae	perennial rhizomatous herb	Mar-Jul	None	None	G3G4	S3	4.2
heart-leaved twayblade	*Listera cordata*	Orchidaceae	perennial herb	Feb-Jul	None	None	G5	S4	4.2
Howell's montia	*Montia howellii*	Montiaceae	annual herb	(Feb)Mar-May	None	None	G3G4	S2	2B.2
Humboldt Bay owl's-clover	*Castilleja ambigua* var. *humboldtiensis*	Orobanchaceae	annual herb (hemiparasitic)	Apr-Aug	None	None	G4T2	S2	1B.2
Kellogg's lily	*Lilium kelloggii*	Liliaceae	perennial bulbiferous herb	(Feb)May-Aug	None	None	G3	S3	4.3
leafy-stemmed mitrewort	*Mitellastra caulescens*	Saxifragaceae	perennial rhizomatous herb	(Mar)Apr-Oct	None	None	G5	S4	4.2
Lyngbye's sedge	*Carex lyngbyei*	Cyperaceae	perennial rhizomatous herb	Apr-Aug	None	None	G5	S3	2B.2
maple-leaved checkerbloom	*Sidalcea malachroides*	Malvaceae	perennial herb	(Mar)Apr-Aug	None	None	G3	S3	4.2

checkerbloom									
marsh pea	*Lathyrus palustris*	Fabaceae	perennial herb	Mar-Aug	None	None	G5	S2	2B.2
Menzies' wallflower	*Erysimum menziesii*	Brassicaceae	perennial herb	Mar-Sep	FE	CE	G1	S1	1B.1
Methuselah's beard lichen	*Usnea longissima*	Parmeliaceae	fruticose lichen (epiphytic)		None	None	G4	S4	4.2
minute pocket moss	*Fissidens pauperculus*	Fissidentaceae	moss		None	None	G3?	S2	1B.2
nodding semaphore grass	*Pleuropogon refractus*	Poaceae	perennial rhizomatous herb	(Feb-Mar)Apr-Aug	None	None	G4	S4	4.2
northern clustered sedge	*Carex arcta*	Cyperaceae	perennial herb	Jun-Sep	None	None	G5	S1	2B.2
northern meadow sedge	*Carex praticola*	Cyperaceae	perennial herb	May-Jul	None	None	G5	S2	2B.2
Oregon coast paintbrush	*Castilleja litoralis*	Orobanchaceae	perennial herb (hemiparasitic)	Jun	None	None	G3	S3	2B.2
Pacific gilia	*Gilia capitata* ssp. *pacifica*	Polemoniaceae	annual herb	Apr-Aug	None	None	G5T3	S2	1B.2
Pacific golden saxifrage	*Chrysosplenium glechomifolium*	Saxifragaceae	perennial herb	Feb-Jun	None	None	G5?	S3	4.3
perennial goldfields	*Lasthenia californica* ssp. *macrantha*	Asteraceae	perennial herb	Jan-Nov	None	None	G3T2	S2	1B.2
pink sand-verbena	*Abronia umbellata* var. *breviflora*	Nyctaginaceae	annual herb	Jun-Oct	None	None	G4G5T2	S2	1B.1
Point Reyes salty bird's-beak	*Chloropyron maritimum* ssp. *palustre*	Orobanchaceae	annual herb (hemiparasitic)	Jun-Oct	None	None	G4?T2	S2	1B.2
Rattan's milk-vetch	*Astragalus rattanii* var. *rattanii*	Fabaceae	perennial herb	Apr-Jul	None	None	G4T4	S4	4.3
round-headed collinsia	*Collinsia corymbosa*	Plantaginaceae	annual herb	Apr-Jun	None	None	G1	S1	1B.2
running-pine	*Lycopodium clavatum*	Lycopodiaceae	perennial rhizomatous herb	Jun-Aug(Sep)	None	None	G5	S3	4.1
Scouler's catchfly	*Silene scouleri* ssp. *scouleri*	Caryophyllaceae	perennial herb	(Mar-May)Jun-Aug(Sep)	None	None	G5T4T5	S2S3	2B.2
sea-watch	*Angelica lucida*	Apiaceae	perennial herb	Apr-Sep	None	None	G5	S3	4.2
seaside bittercress	*Cardamine angulata*	Brassicaceae	perennial herb	(Jan)Mar-Jul	None	None	G4G5	S3	2B.2
seaside pea	*Lathyrus japonicus*	Fabaceae	perennial rhizomatous herb	May-Aug	None	None	G5	S2	2B.1
short-leaved evax	*Hesperevax sparsiflora* var. *brevifolia*	Asteraceae	annual herb	Mar-Jun	None	None	G4T3	S3	1B.2
Siskiyou checkerbloom	*Sidalcea malviflora* ssp. *patula*	Malvaceae	perennial rhizomatous herb	(Mar)May-Aug	None	None	G5T2	S2	1B.2
small spikerush	*Eleocharis parvula*	Cyperaceae	perennial herb	(Apr)Jun-Aug(Sep)	None	None	G5	S3	4.3
sticky pea	*Lathyrus glandulosus*	Fabaceae	perennial	Apr-Jun	None	None	G3	S3	4.3

			rhizomatous herb						
trailing black currant	*Ribes laxiflorum*	Grossulariaceae	perennial deciduous shrub	Mar-Jul(Aug)	None	None	G5?	S3	4.3
twisted horsehair lichen	*Sulcaria spiralifera*	Parmeliaceae	fruticose lichen (epiphytic)		None	None	G3G4	S2	1B.2
western lily	*Lilium occidentale*	Liliaceae	perennial bulbiferous herb	Jun-Jul	FE	CE	G1G2	S1	1B.1
western sand-spurrey	*Spergularia canadensis* var. *occidentalis*	Caryophyllaceae	annual herb	Jun-Aug	None	None	G5T4	S1	2B.1
Wolf's evening-primrose	*Oenothera wolfii*	Onagraceae	perennial herb	May-Oct	None	None	G2	S1	1B.1

Showing 1 to 49 of 49 entries

Suggested Citation:

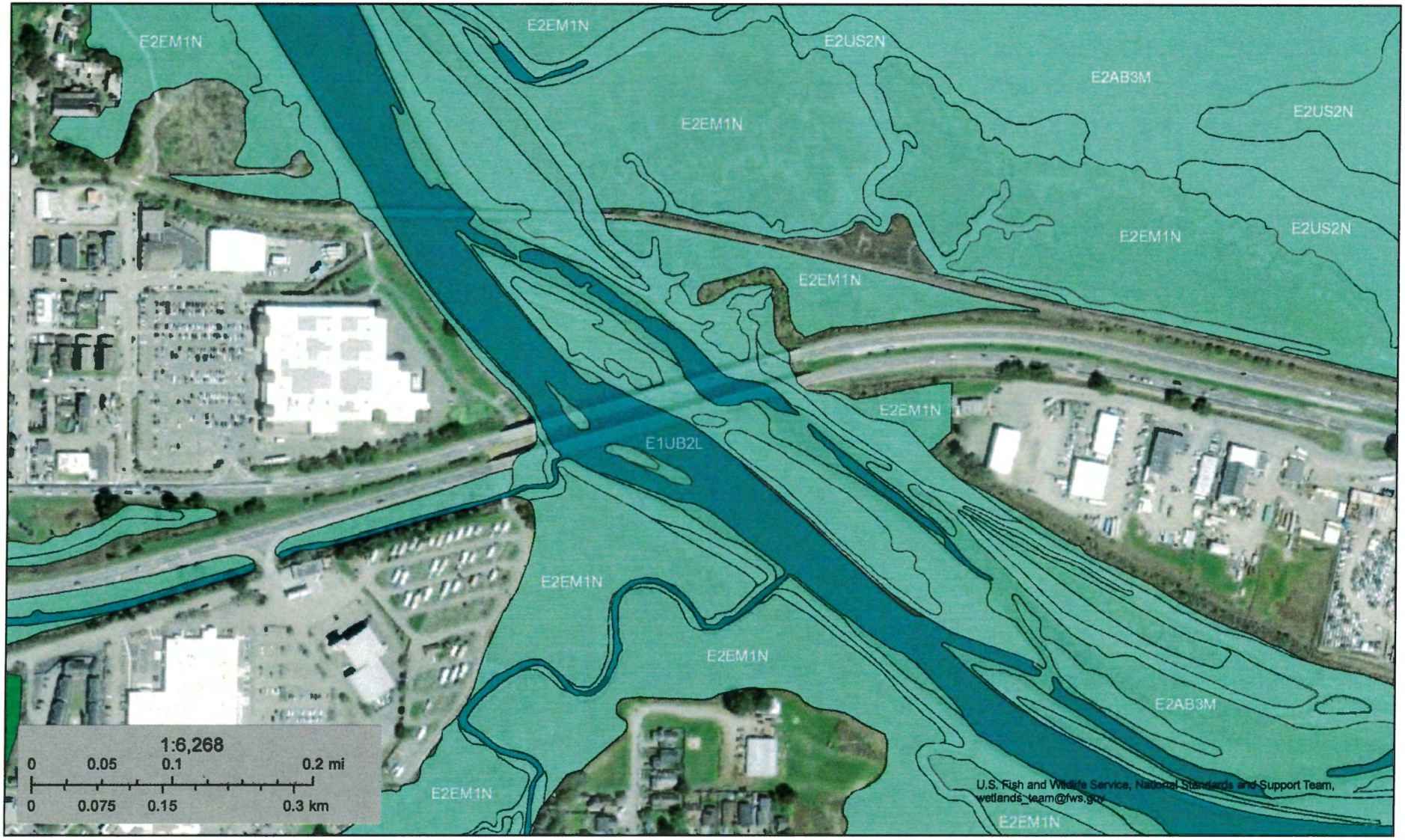
California Native Plant Society, Rare Plant Program. 2023. Rare Plant Inventory (online edition, v9.5). Website https://www.rareplants.cnps.org [accessed 26 January 2023].

APPENDIX F. National Wetlands Inventory Map

U.S. Fish and Wildlife Service

National Wetlands Inventory

0F200 Geotech



November 16, 2022

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

APPENDIX G. Botanical Inventory and Rare Plants Map

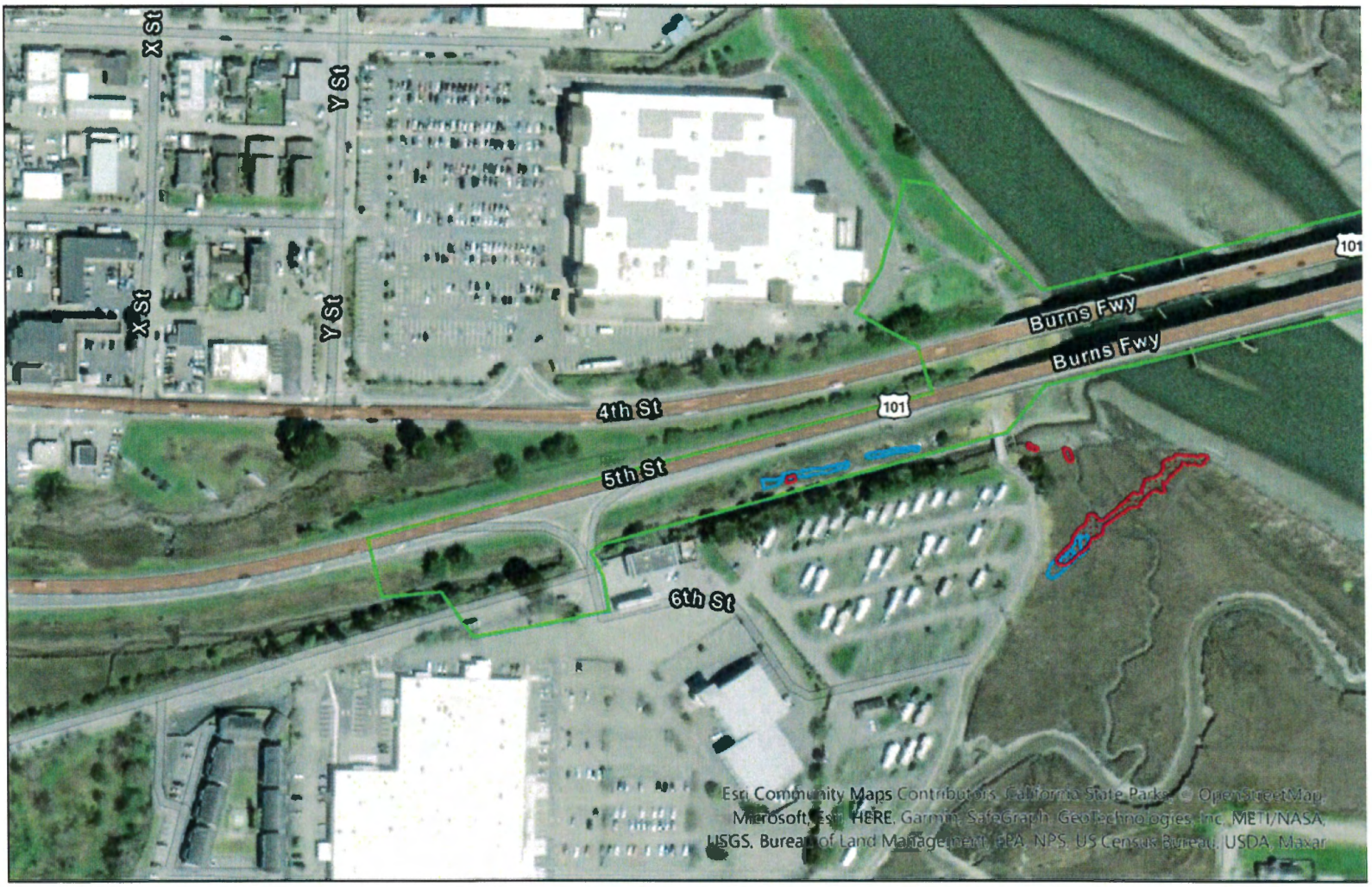
EUREKA SLOUGH BOTANICAL SPECIES LIST	
Acer macrophyllum	bigleaf maple
Achillea millefolium	yarrow
Acmispon americanus var. americanus	Spanish lotus
Agrostis exarata	spike bentgrass
Agrostis stolonifera	creeping bentgrass
Aira caryophyllea	silver European hairgrass
Alnus rubra	red alder
Anagallis arvensis	scarlet pimpernel
Anaphalis margaritacea	pearly everlasting
Angelica sp.	Angelica
Anthoxanthum odoratum	sweet vernal grass
Arrhenatherum elatius	tall oat grass
Aster chilensis	California aster
Athyrium filix-femina	lady fern
Atriplex prostrata	fat-hen
Avena barbata	slender wild oat
Baccharis pilularis	coyote brush
Baccharis salicifolia	mule fat
Bellis perennis	English daisy
Briza maxima	rattlesnake grass
Briza minor	annual quacking grass
Bromus carinatus	California brome
Bromus diandrus	ripgut brome
Bromus hordeaceus	soft chess brome
Bromus madritensis	foxtail chess
Carex obnupta	slough sedge
Castilleja ambigua ssp. humboldtiensis (CRPR List 1B.2)	Humboldt Bay owl's clover
Ceanothus thyrsiflorus var. thyrsiflorus	blue blossom
Chloropyron maritimum ssp. palustre (CRPR List 1B.2)	Point Reyes salty bird's-beak
Cirsium arvense	Canada thistle
Cirsium vulgare	bull thistle
Conium maculatum	poison hemlock
Convolvulus arvensis	field bindweed
Cortaderia jubata	pampas grass
Cotoneaster franchetii	cotoneaster
Cotula coronopifolia	brass buttons
Cuscuta sp.	dodder
Cynosurus echinatus	bristly dogtail grass
Cyperus eragrostis	tall nutsedge
Cytisus scoparius	scotch broom

EUREKA SLOUGH BOTANICAL SPECIES LIST	
Dactylis glomerata	orchard grass
Daucus carota	Queen Anne's lace
Deschampsia cespitosa	tufted hair grass
Dipsacus fullonum	wild teasel
Distichlis spicata	salt grass
Epilobium brachycarpum	willow herb
Equisetum arvense	common horsetail
Equisetum telmateia var. braunii	giant horsetail
Euphorbia peplus	spurge
Festuca arundinacea	tall fescue
Festuca myuros	rattail grass
Festuca myuros	rattail sixweeks grass
Festuca perennis	perennial rye grass
Foeniculum vulgare	fennel
Fragaria chiloensis	beach strawberry
Galium aparine	common bedstraw
Gaultheria shallon	salal
Genista monspessulana	French broom
Geranium dissectum	cranesbill
Geranium molle	doves-foot geranium
Hedera helix	English ivy
Helminthotheca echioides	bristly ox-tongue
Heracleum maximum	cow parsnip
Hesperocyparis macrocarpa	Monterey cypress
Holcus lanatus	velvet grass
Hordeum brachyantherum	meadow barley
Hypericum perforatum	St. John's wort
Hypochaeris radicata	rough cats-ear
Ilex aquifolium	English holly
Iris douglasiana	Douglas iris
Jaumea carnosa	jaumea
Juncus bufonius	toad rush
Juncus effusus	common rush
Juncus lescurii	San Francisco rush
Juncus patens	spreading rush
Lathyrus latifolius	everlasting sweet pea
Leucanthemum vulgare	ox-eye daisy
Limonium californicum	western marsh-rosemary
Linum bienne	flax
Lonicera hispidula	honeysuckle

EUREKA SLOUGH BOTANICAL SPECIES LIST	
Lonicera involucrata	twinberry
Lotus corniculatus	bird's-foot trefoil
Lupinus arboreus	yellow bush lupine
Lupinus latifolius var. latifolius	broad leaf lupine
Matricaria discoidea	pineapple weed
Medicago polymorpha	California burclover
Melilotus officinalis	yellow sweetclover
Mentha pulegium	pennyroyal
Morella californica	wax myrtle
Nerium oleander	oleander
Oxalis incarnata	oxalis
Parentucellia viscosa	yellow glandweed
Picea sitchensis	Sitka spruce
Pinus contorta subsp. contorta	shore pine
Pinus muricata	Bishop pine
Pinus radiata	Monterey pine
Plantago coronopus	Buckhorn plantain
Plantago erecta	California plantain
Plantago lanceolata	English plantain
Plantago major	common plantain
Poa annua	annual rye grass
Polygonum aviculare	knotweed
Polypogon monspeliensis	rabbitsfoot grass
Polystichum munitum	sword fern
Populus trichocarpa	black cottonwood
Potentilla anserina ssp. pacifica	Pacific silverweed
Prunella vulgaris	self-heal
Prunus laurocerasus	(cultivar) cherry laurel
Pteridium aquilinum var. pubescens	bracken fern
Ranunculus repens	creeping buttercup
Raphanus sativus	radish
Ribes sanguineum	red-flowering currant
Rosa nutkana	Nootka rose
Rosa sp.	(cultivar) garden rose
Rubus armeniacus	Himalayan blackberry
Rubus parviflorus	thimbleberry
Rubus spectabilis	salmonberry
Rubus ursinus	California blackberry
Rumex acetosella	common sheep sorrel
Rumex crispus	curly dock

EUREKA SLOUGH BOTANICAL SPECIES LIST	
Salicornia pacifica	pickleweed
Salix hookeriana	coastal willow
Salix lasiandra ssp. lasiandra	Pacific willow
Salix lasiolepis	arroyo willow
Sambucus racemosa	red elderberry
Scrophularia californica	California figwort
Senecio sylvaticus	woodland ragwort
Sequoia sempervirens	redwood
Sisyrinchium californicum	golden-eyed grass
Sonchus oleraceus	common sow thistle
Spartina densiflora	dense-flowered cord grass
Spergularia rubra	sand-spurrey
Spiraea douglasii	Douglas' spirea
Stachys ajugoides	rigid hedge-nettle
Stachys chamissonis	hedge nettle
Symphyotrichum chilensis	Pacific aster
Taraxacum officinale	dandelion
Thuja plicata	western red cedar
Toxicodendron diversilobum	poison oak
Tragopogon porrifolius	oyster plant
Trifolium dubium	little hop clover
Trifolium pratense	red clover
Trifolium repens	white clover
Triglochin maritima	common arrow-grass
Triticum aestivum	wheat
Typha sp.	cattail
Vaccinium ovatum	evergreen huckleberry
Vicia hirsuta	hairy vetch
Vicia sativa ssp. sativa	common vetch
Vinca major	greater periwinkle

Rare Plant Communities
Map 1



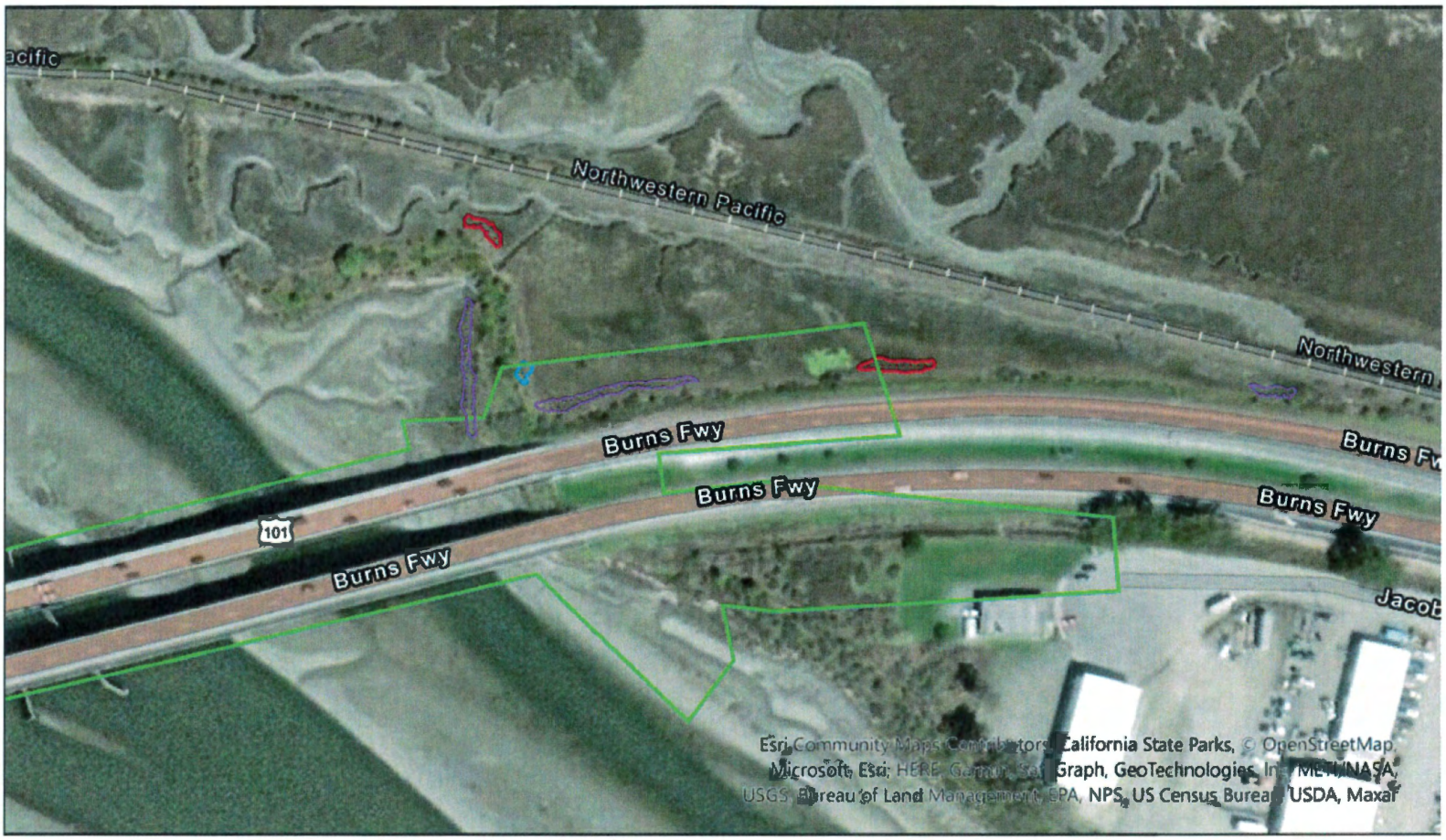
Geotech ESL
Point Reyes Birds Beak (PRBB)
Humboldt Bay Owl Clover (HBOC)
PRBB and HBOC

0 125 250 500 Feet

01-0F200 Eureka Slough Bridges Rare Plant Communities
Humboldt County US 101
Lat: 40.8040, Long: -124.1415

Caltrans

Rare Plant Communities
Map 2



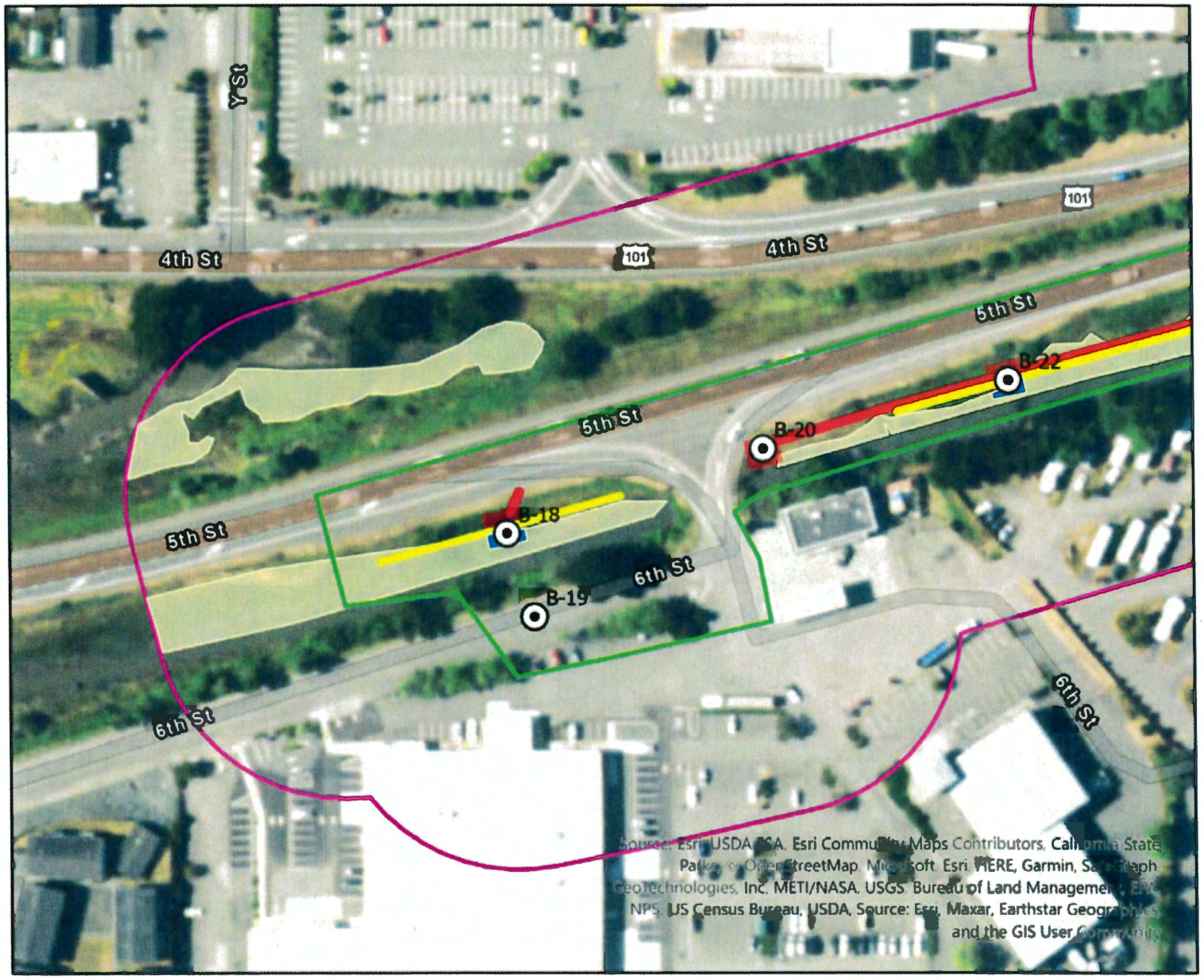
- Geotech ESL
- Point Reyes Birds Beak (PRBB)
- Humboldt Bay Owl Clover (HBOC)
- PRBB and HBOC

0 80 160 320 Feet

01-0F200 Eureka Slough Bridges Rare Plant Communities
Humboldt County US 101
Lat: 40.8060, Long: -124.1389

Caltrans

Sensitive Natural Communities
Map 1



- Geotech Buffer
- GeotechESL
- Pickleweed Mats Herbaceous Alliance
- Pickleweed Temporary Impacts
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line
- Salal - Berry Brambles Alliance

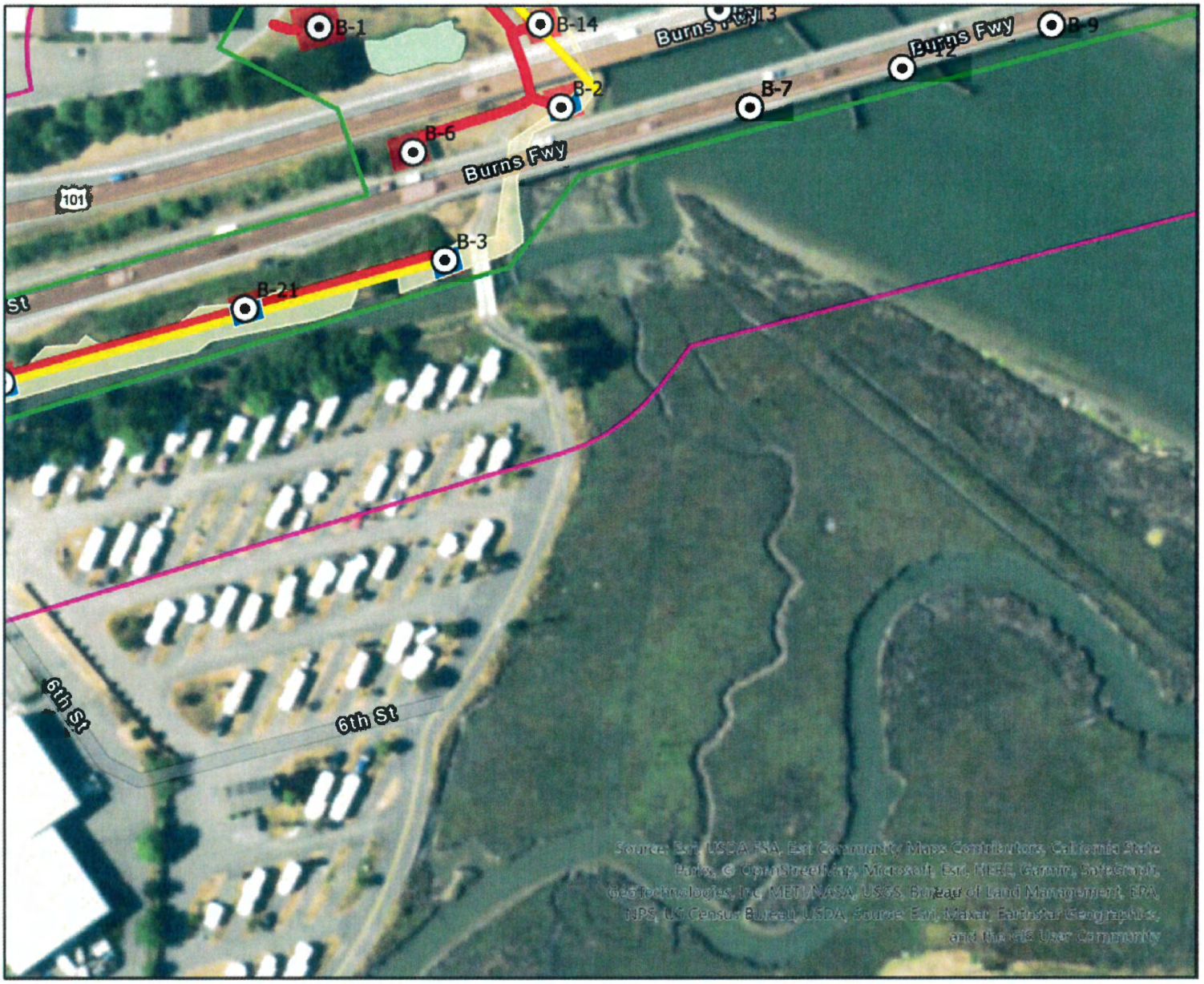
0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Sensitive Natural Communities
Map 2



- Geotech Buffer
- GeotechESL
- Pickleweed Mats Herbaceous Allience
- Pickleweed Temporary Impacts
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line
- Salal - Berry Brambles Allience

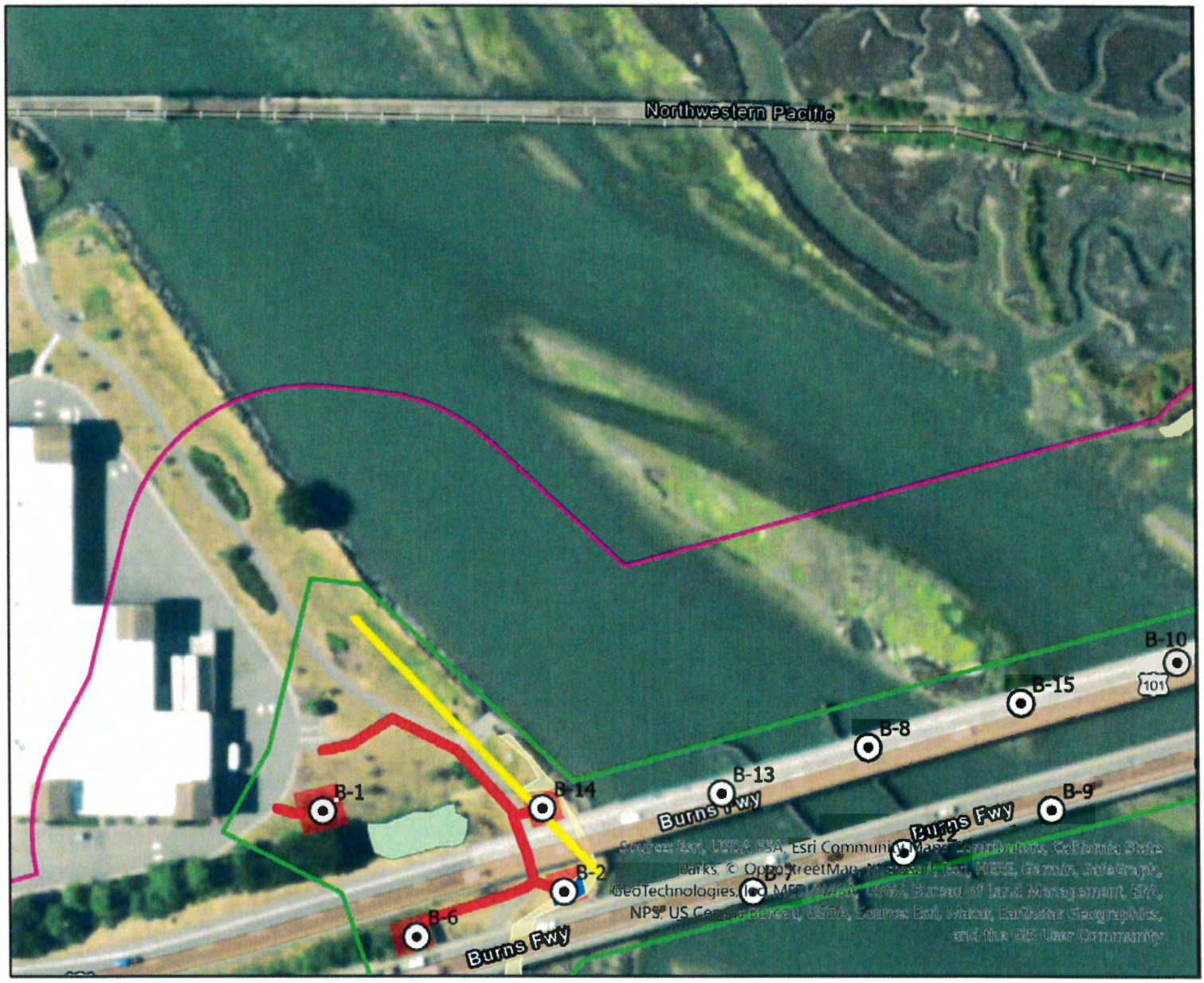
0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Sensitive Natural Communities
Map 3



Geotech Buffer
GeotechESL
Pickleweed Mats Herbaceous Allience
Pickleweed Temporary Impacts
Work Area
Access Path
Bore Hole
Seismic Refraction Line
Salal - Berry Brambles Allience

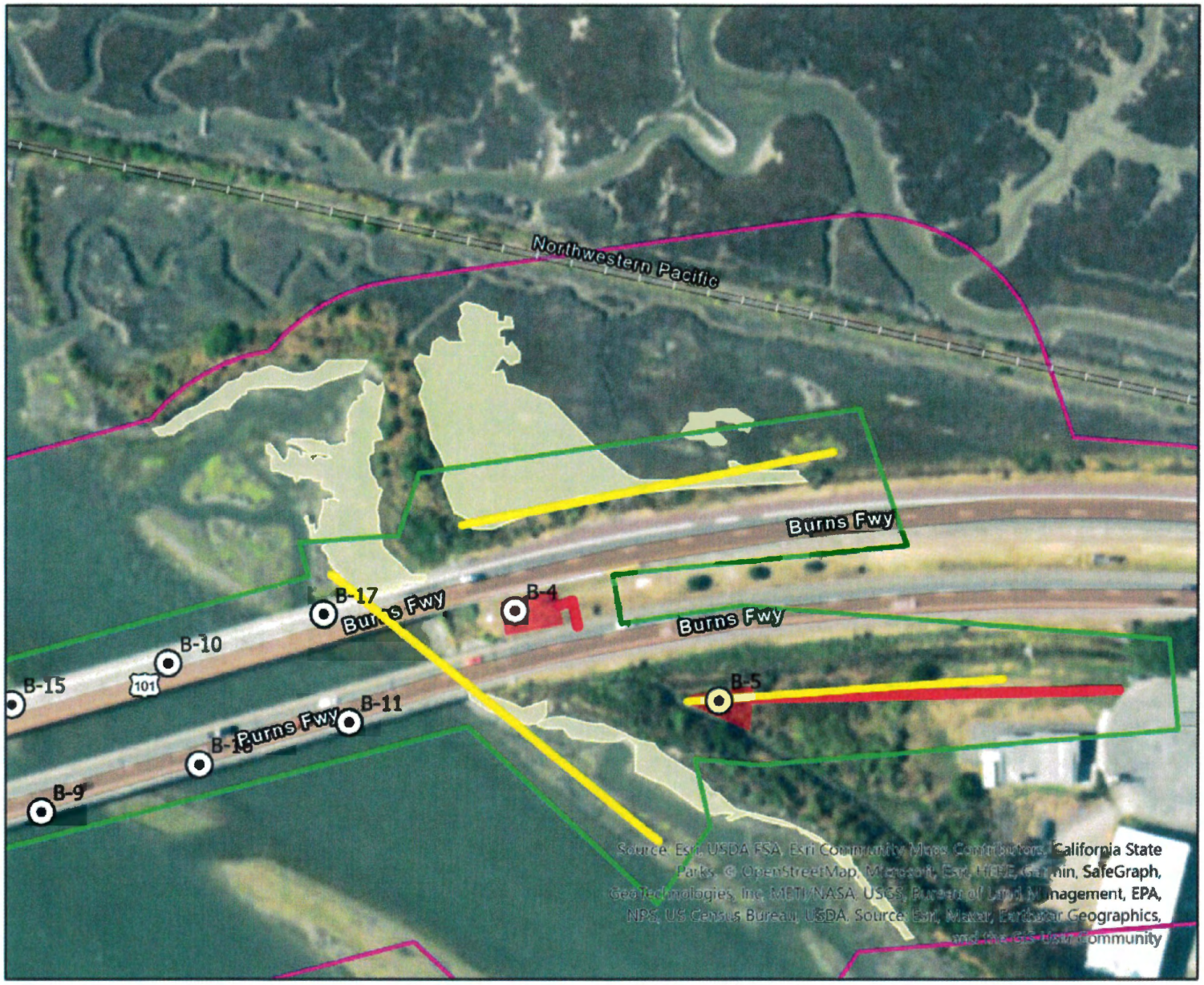
0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Sensitive Natural Communities
Map 4



- Geotech Buffer
- GeotechESL
- Pickleweed Mats Herbaceous Allience
- Pickleweed Temporary Impacts
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line
- Salal - Berry Brambles Allience

0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Photos of Sensitive Plant Species and Sensitive Natural Communities for Eureka Slough

Photo 1: (CRPR List 1B.2) Humboldt Bay owl's clover (*Castilleja ambigua ssp. humboldtiensis*) located in the BSA

Photo 2: (CRPR List 1B.2) Point Reyes salty bird's-beak(*Chloropyron maritimum ssp. palustre*) located in the BSA

Photo 3: Representative photo of Pickleweed – seaside arrowgrass (*Triglochin maritima*) Association

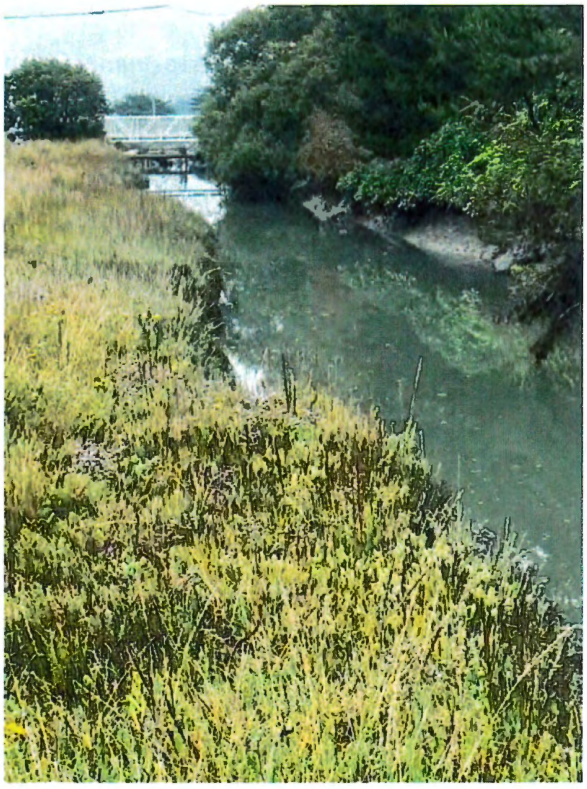
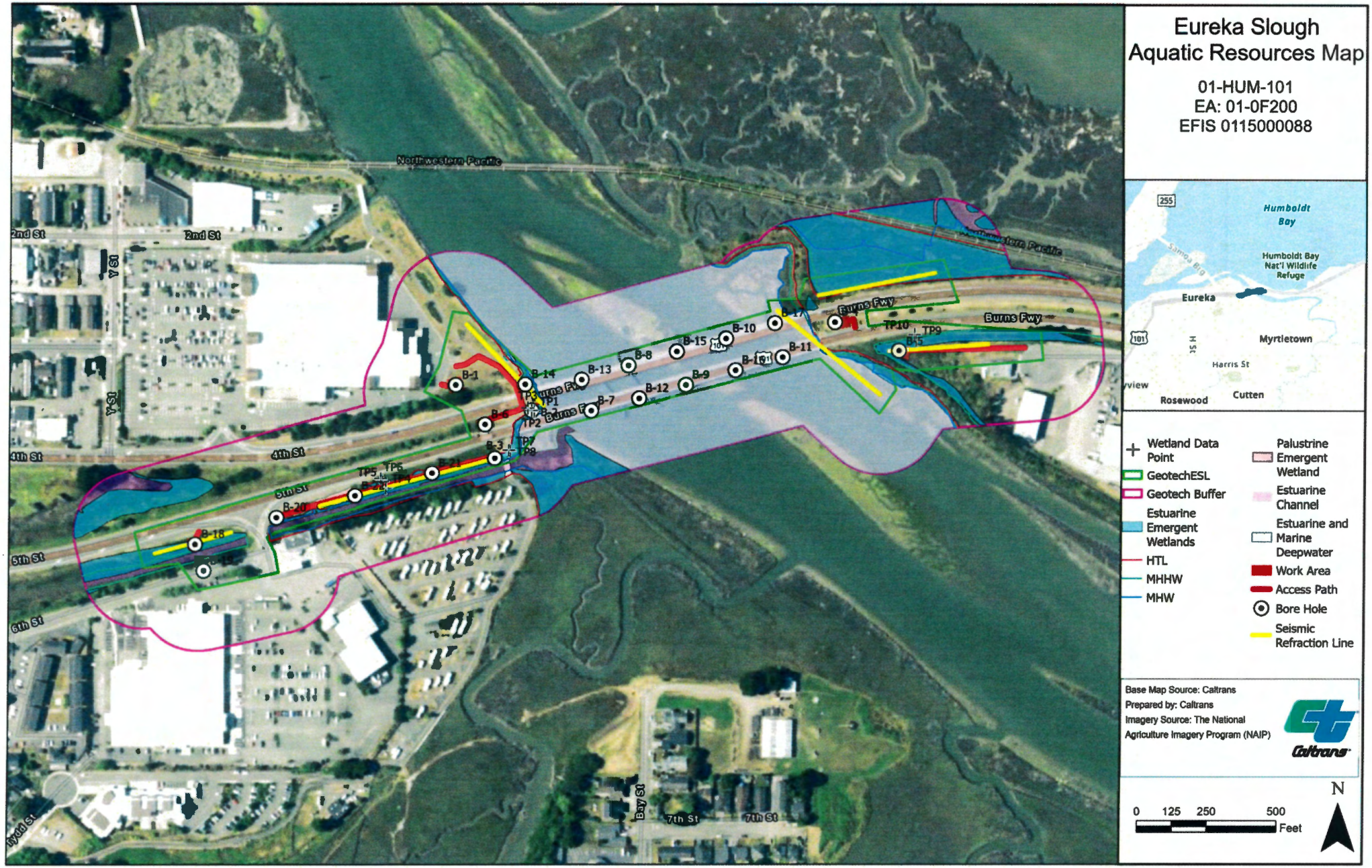
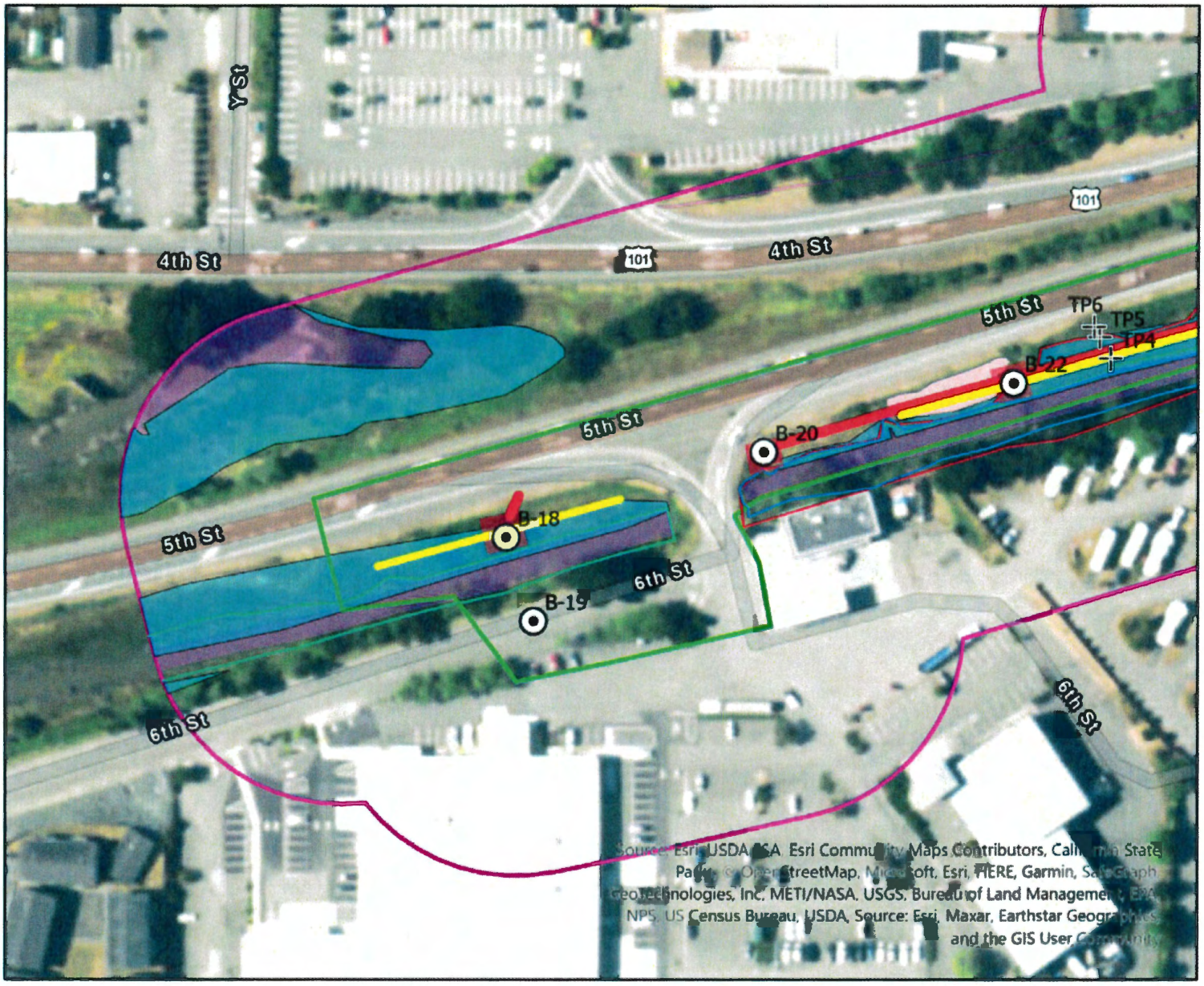


Photo 4: Representative photo of Pickleweed – saltmarsh dodder (*Cuscuta saline*) – dense-flowered cordgrass (*Spartina densiflorus*) Association

APPENDIX H. Aquatic Resources Delineation


Eureka Slough
Aquatic Resources Map
01-HUM-101
EA: 01-0F200
EFIS 0115000088
Humboldt Bay
Humboldt Bay Nat'l Wildlife Refuge
Eureka
Myrtletown
Harris St
Rosewood
Cutten
Wetland Data Point
GeotechESL
Geotech Buffer
Estuarine Emergent Wetlands
HTL
MHHW
MHW
Palustrine Emergent Wetland
Estuarine Channel
Estuarine and Marine Deepwater
Work Area
Access Path
Bore Hole
Seismic Refraction Line
Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: The National Agriculture Imagery Program (NAIP)
Caltrans
0 125 250 500
Feet
N
Northwestern Pacific
Burns Fwy
2nd St
Y St
4th St
5th St
6th St
7th St
Bay St
B-1
B-3
B-5
B-6
B-7
B-8
B-9
B-10
B-11
B-12
B-13
B-14
B-15
B-16
B-17
B-20
B-21
TP1
TP2
TP5
TP6
TP9
TP10

Aquatic Resources Delineation
Map 1



- Geotech Buffer
- GeotechESL
- Wetland Data Point
- HTL
- MHHW
- MHW
- Palustrine Emergent Wetland
- Estuarine Emergent Wetlands
- Estuarine Channel
- Estuarine and Marine Deepwater
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line

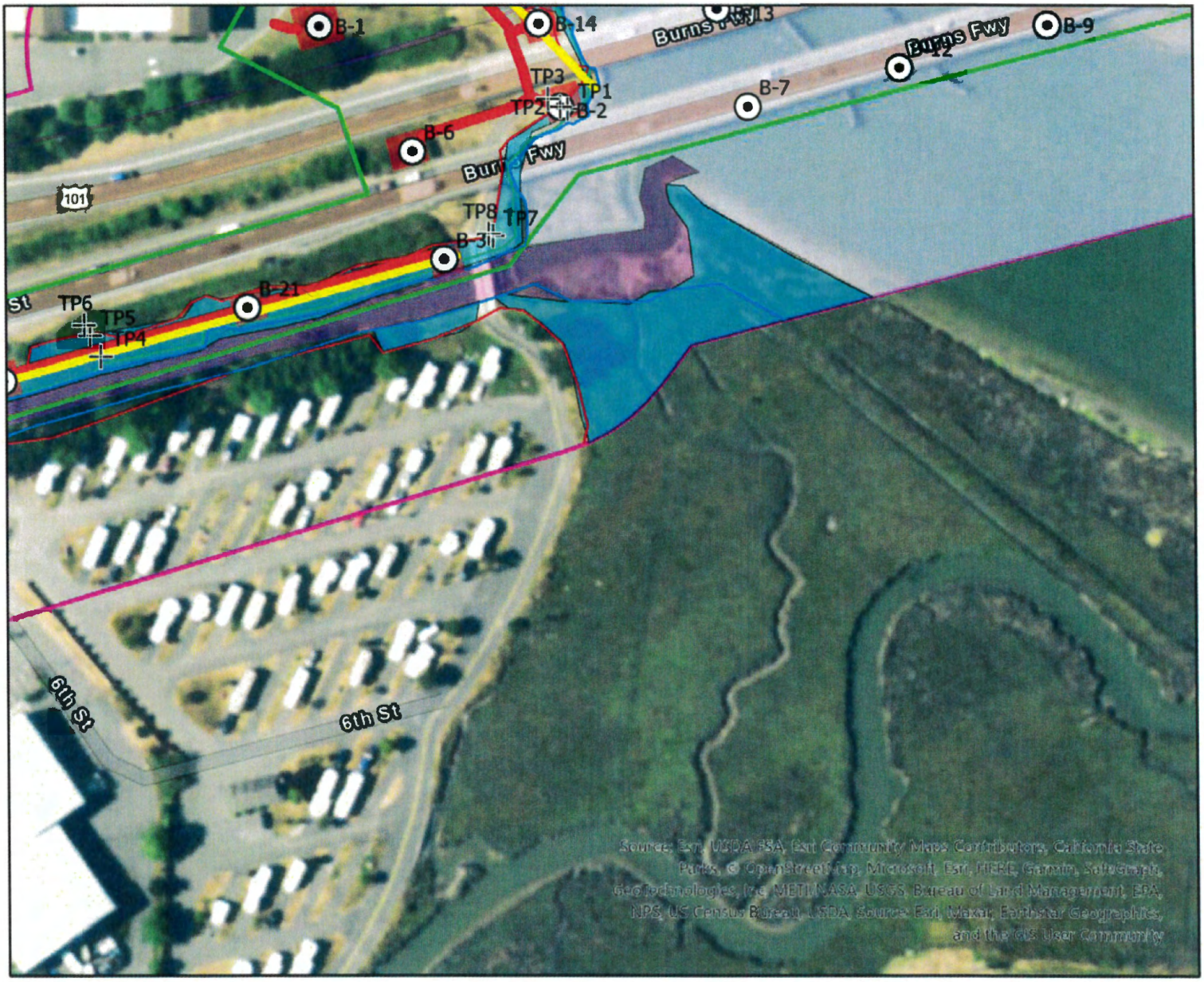
0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Aquatic Resources Delineation
Map 2



Geotech Buffer
GeotechESL
Wetland Data Point
HTL
MHHW
MHW
Palustrine Emergent Wetland
Estuarine Emergent Wetlands
Estuarine Channel
Estuarine and Marine Deepwater
Work Area
Access Path
Bore Hole
Seismic Refraction Line

0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Aquatic Resources Delineation
Map 3

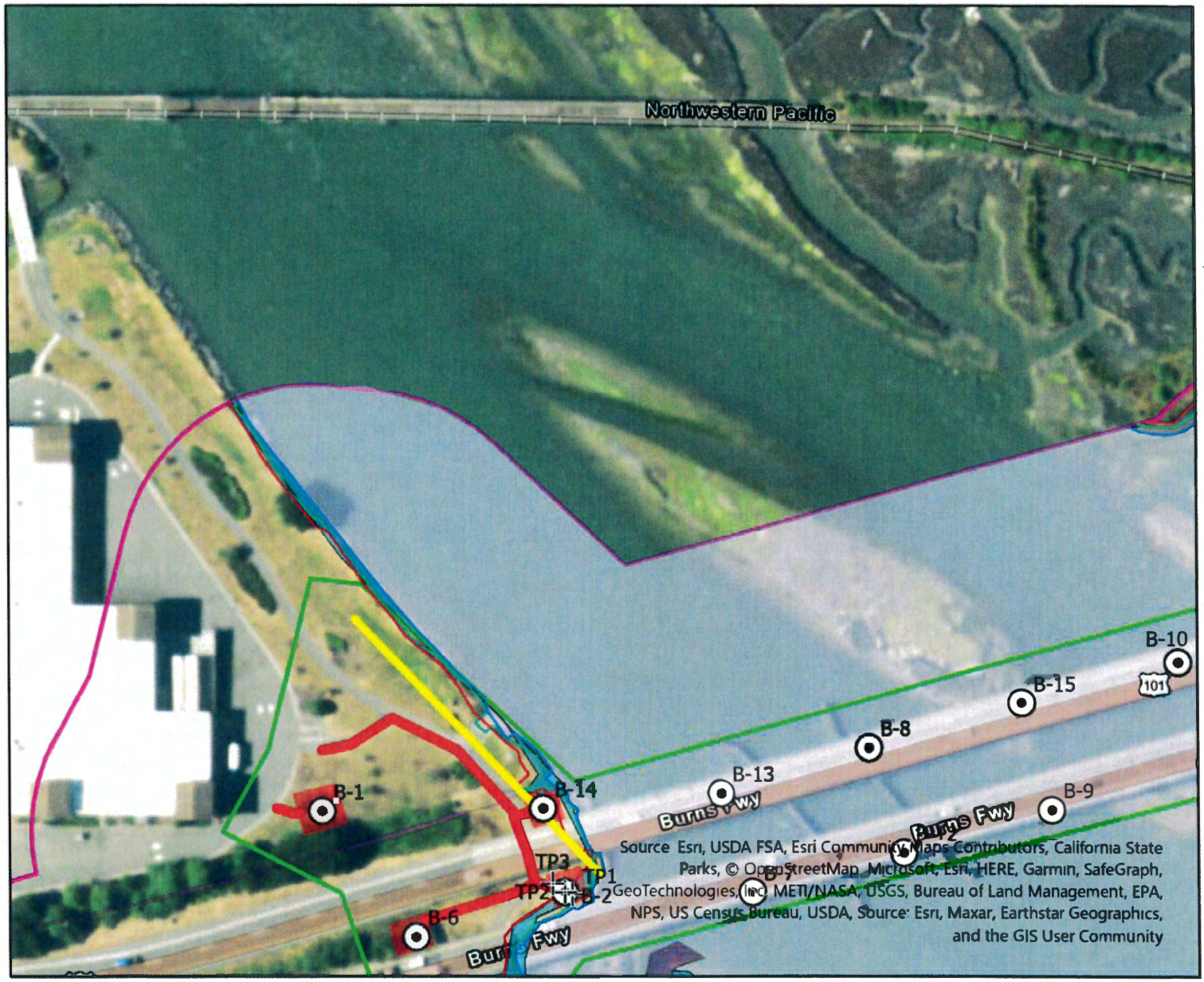
- Geotech Buffer
- GeotechESL
- Wetland Data Point
- HTL
- MHHW
- MHW
- Palustrine Emergent Wetland
- Estuarine Emergent Wetlands
- Estuarine Channel
- Estuarine and Marine Deepwater
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line

0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Aquatic Resources Delineation
Map 4



- Geotech Buffer
- GeotechESL
- Wetland Data Point
- HTL
- MHHW
- MHW
- Palustrine Emergent Wetland
- Estuarine Emergent Wetlands
- Estuarine Channel
- Estuarine and Marine Deepwater
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line

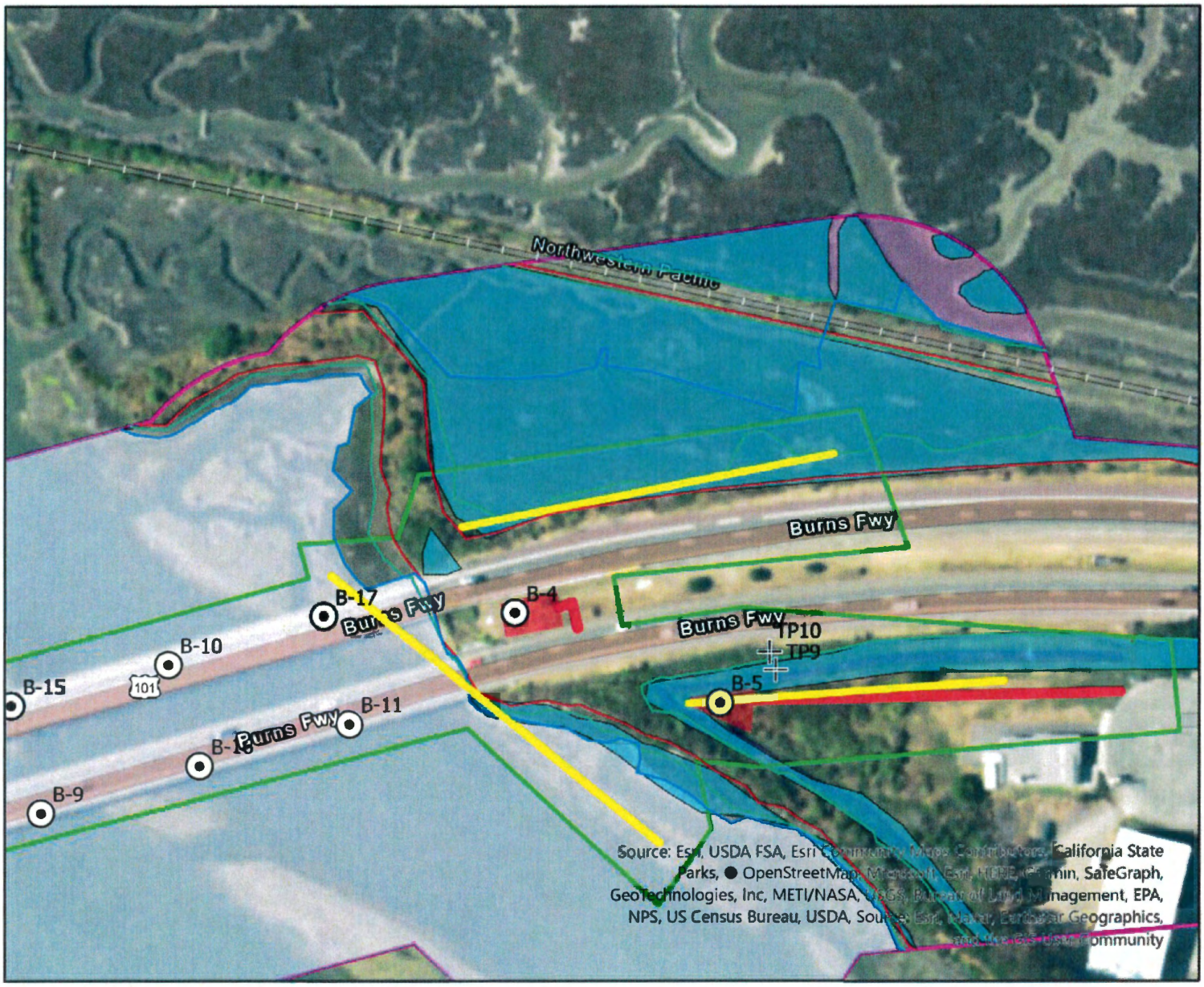
0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Aquatic Resources Delineation
Map 5



- Geotech Buffer
- GeotechESL
- Wetland Data Point
- HTL
- MHHW
- MHW
- Palustrine Emergent Wetland
- Estuarine Emergent Wetlands
- Estuarine Channel
- Estuarine and Marine Deepwater
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line

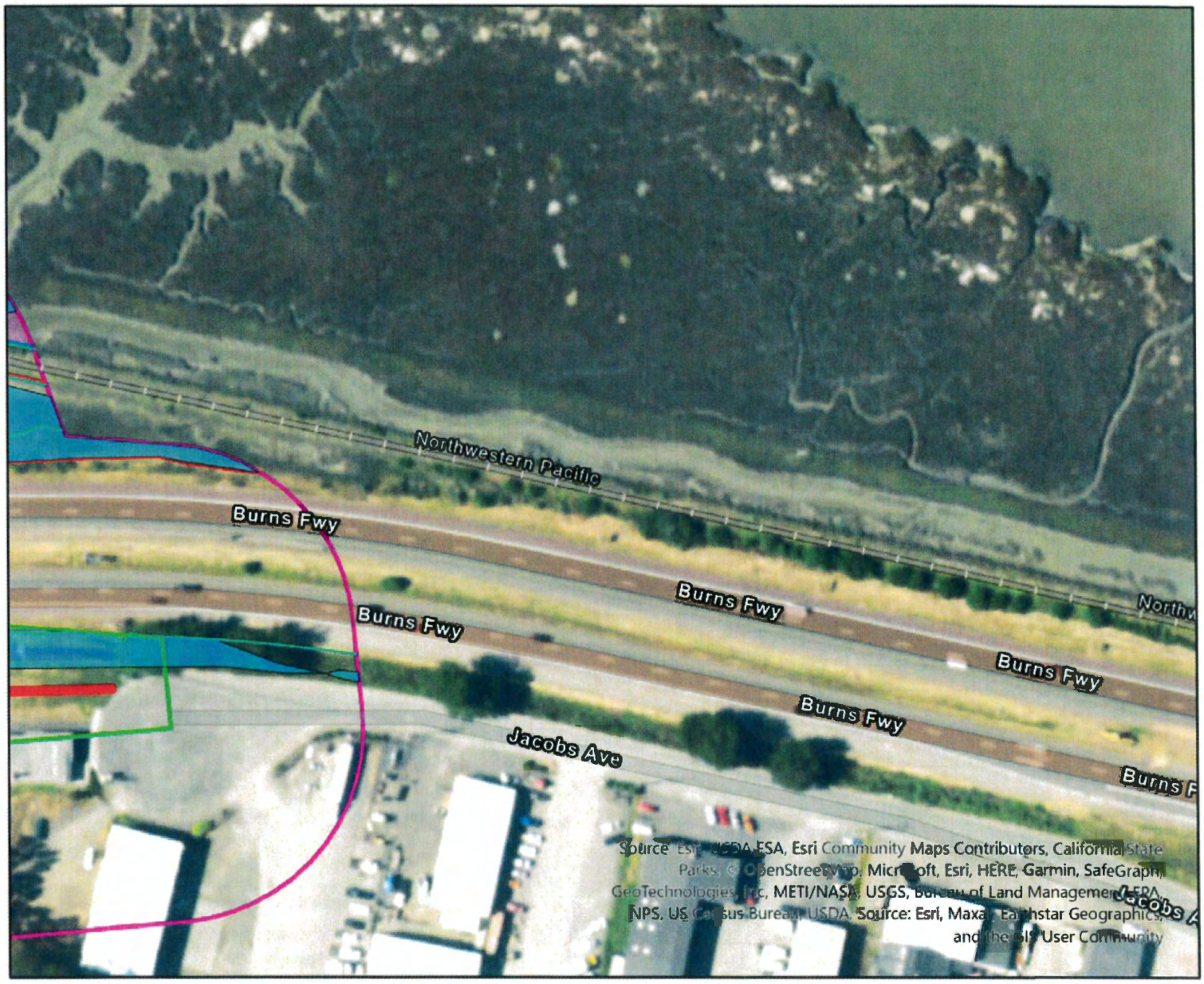
0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

Aquatic Resources Delineation
Map 6



- Geotech Buffer
- GeotechESL
- Wetland Data Point
- HTL
- MHHW
- MHW
- Palustrine Emergent Wetland
- Estuarine Emergent Wetlands
- Estuarine Channel
- Estuarine and Marine Deepwater
- Work Area
- Access Path
- Bore Hole
- Seismic Refraction Line

0 62.5 125 250 375 500 US Feet

N

Base Map Source: Caltrans
Prepared by: Caltrans
Imagery Source: National Agriculture Imagery Program (NAIP)

Caltrans

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 20, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-1
Investigator(s): HH SF CH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 10
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes X No ___**
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: this transect of test pits is located on a sloping hillside between the N/B and S/B bridges.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5x5)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Salicornia pacifica	60	x	OBL
2. Distichlis spicata	8		FACW
3. Atriplex prostrata	12		FAC
4. Hordeum brachytherum	10		FACW
5. Festuca rubra	10		FAC
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	Organic Layer	100						
4-7	10yr 3/1	100					SCL	
7-14	10 yr 4/1		7.5 yr 4/4	40	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** x **No** ____

Remarks: redox observed at 7 inches. .

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes x No ___ Depth (inches): 14'

Saturation Present? (includes capillary fringe) Yes x No ___ Depth (inches): 12

Wetland Hydrology Present? **Yes** x **No** ____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 20, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-2
Investigator(s): HH SF CH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 10
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?**	**Yes X No ___**
Hydric Soil Present?	Yes X	No ___		
Wetland Hydrology Present?	Yes X	No ___		

Remarks: this transect of test pits is located on a sloping hillside between the N/B and S/B bridges.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Elochaeris palustris	55		OBL
2. Spergularia	5		FAC
3. Lotus corniculatus	8		FAC
4. Deschampsia	10		NL
5. Festuca rubra	15		FAC
6. Plantago coronopus. .	2		FAC
7. Festuca arundineace	2		NL
8. Agrostis exarata	2		FACW
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 8 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0.75 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	Organic Layer							
3-12	10yr 3/2	75	7.5 yr 4/6	15	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- x Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks: Presence of reduced iron at 3 inches

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): 9

Saturation Present? (includes capillary fringe) Yes X No 10 Depth (inches): ___

Wetland Hydrology Present? Yes x No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 20, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-3
Investigator(s): HH SF CH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 10
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: this transect of test pits is located on a sloping hillside between the N/B and S/B bridges.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Lotus corniculatus	3		FAC
2. Plantago lanceolata	20	x	FACU
3. Cynosurus echinatus	20	x	NL
4. Festuca myuros	10		NL
5. Avena barbata	8		UPL
6. Dactylus glomerata	8		FACU
7. Aira caryolhyllea	8		FACU
8. Festuca arundinaceae	4		NL
9. Bromus hordaceous	7		FACU
10. Foeniculum vulgare	3		NL
11. Spergularia	1		NL
	92 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-10	10yr 4/2	100					SL	Unconsolidated fill material

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (If present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No x

Remarks: Soil pit dug in the fill with restrictive layer at 10"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): _____

Water Table Present? Yes ___ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): _____

Wetland Hydrology Present? Yes ___ No x

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 27, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-4
Investigator(s): HH RO Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 15
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes X No ___**
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks: this transect of test pits is located on a sloping hillside alongside Target Slough. Care was taken to not disturb sensitive plant species.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Salicornia pacifica	30	x	OBL
2. Chloropyron maritimum	15		FACW
3. Triglochin marina	3		OBL
4. Distchlis spicata	1		FACW
5. Limonium	12		FACW
6. Junea carnosa	25	x	OBL
7. Festuca rubra	5		FAC
8. Spartina	5		OBL
9. Grindellia	2		FACW
10. Atriplex	1		FAC
11. Cuscuta	1		OBL
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ___**

Remarks:

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	Organic Layer	100						
3-14	10yr 4/1	80	5yr 5/8	20	C	M/PL	CL	Patches of sandy soil

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- x Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks: redox observed at three inches. Redox observed along pore lining.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- x Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes x No ___ Depth (inches): 4

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes x No ___

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

Remarks: Strong hydrogen sulphide smell observed while digging the pit.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 27, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-5
Investigator(s): HH RO Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 15
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes X No ___
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes X	No ___	

Remarks: this transect of test pits is located on a sloping hillside alongside Target Slough.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Salicornia pacifica	75	x	OBL
2. Festuca rubra	11		FAC
3. Atriaplex prostrata	2		OBL
4. Spartina	6		OBL
5. Symphyotrichum chilense	2		FAC
6. Distichlis spicata	3		FACW
7. Unidentified grass	1		NL
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	Organic Layer	100						
2-16	10yr 4/1	80	5yr 5/8	20	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- x Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks: redox observed throughout the pit after 2 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- x High Water Table (A2)
- x Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes x No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes x No ___ Depth (inches): 7

Wetland Hydrology Present? Yes x No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 27, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-6
Investigator(s): HH RO Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 15
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?**	**Yes ___ No X**
Hydric Soil Present?	Yes ___	No X		
Wetland Hydrology Present?	Yes ___	No X		

Remarks: this transect of test pits is located on a sloping hillside alongside Target Slough.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Festuca arundinaceae	20	x	NL
2. Lathyrus latifolius	18	x	NL
3. Foeniculum vulgare	13		NL
4. Juncus balticus	3		FACW
5. Festuca rubra	2		FAC
6. Raphanus sativa	10		NL
7. Holcus lanatum	3		FAC
8. Achillea millefolium	7		FACU
9. Sympotricum chillense	10		FAC
10.			
11.			
	85 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1. Rubus armeniacus	15	x	FAC
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	Organic Layer	100						
2-12	10yr 3/2	100					SCL	Unconsolidated fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks: Sil pit dug in unconsolidated fill material

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 20, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-7
Investigator(s): HH SF CH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 10
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X No ___	**Is the Sampled Area within a Wetland?** **Yes X No ___**
Hydric Soil Present?	Yes X No ___	
Wetland Hydrology Present?	Yes X No ___	

Remarks:.Pit is in a fill slope above dominated by salt grass

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Distichlis spicata	60	x	FACW
2. Anthoxanthum odoratum	6		FACU
3. Achillea millifolium	8		FACU
4. Rumex crispus	8		FAC
5. Brommus hordaceous	10		FACU
6. Salicornia	2		OBL
7. Festuca rubra	2		FACW
8. Cynosaurus echinatus	2		FACU
9. Cirsium vulgare	1		FACU
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ___**

Remarks:Salt grass roots extend to 14 inches

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	Organic Layer	100						
2-14	10yr 3/1	60	7.5 yr 5/8	40	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes x No ___

Remarks: redox observed at 7 inches. .

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- x Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- x Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): _____

Water Table Present? Yes ___ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): _____

Wetland Hydrology Present? Yes x No ___

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

Remarks: Saturation observed at 8 inches

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: July 20, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-8
Investigator(s): HH SF CH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 12
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks:.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: ___)			
1. Festuca myuros	30	x	NL
2. Distichlis spicata	25	x	FACW
3. Anthoxanthum odoratum	7		FACU
4. Avena sativa	2		UPL
5. Lotus corniculatus	5		FACW
6. Baccharis pilularis	3		NL
7. Melilotus alba	1		NL
8. Bromus hordeaceous	7		FACU
9. Rumex crispus	10		FAC
10. Elymus glaucus	2		FACU
11. Hypocharis radicata	1		FACU
Cynosaurus echinatus 1/NL	100	= Total Cover	
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	30	x 2 =	60
FAC species	11	x 3 =	33
FACU species	17	x 4 =	68
UPL species	37	x 5 =	185
Column Totals:	95 (A)		346 (B)

Prevalence Index = B/A = 3.46

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:5' upslope from TP4

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	N/A							Gravel fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** x

Remarks: Compacted fill >16". See TP7 did not reach native soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No x Depth (inches): _____

Water Table Present? Yes ___ No x Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** x

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

Remarks: No hydrologic connection to estuarine waters

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: November 12, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-9
Investigator(s): HH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 12
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No ___ Hydric Soil Present? Yes X No ___ Wetland Hydrology Present? Yes X No ___	**Is the Sampled Area within a Wetland?**	**Yes X No ___**

Remarks:. Site behind Ayers Crematorium

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	___ = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Agrostis exarata	80	x	FACW
2. Holcus lanatus	15		FAC
3. Rumex crispus	2		FAC
4. Conium maculatum	1		FAC
5. Rumex salicifolius	1		FACW
6. Spartina	1		OBL
7.			
8.			
9.			
10.			
11.			
	98 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ___

Remarks:5'

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	Organic Layer							
3-16	10yr 4/1	75	7.5 yr 5/8	15	C	M		SCL

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No X Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10"

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eureka Slough City/County: Eureka Sampling Date: November 12, 2021
Applicant/Owner: Caltrans State: CA Sampling Point: TP-10
Investigator(s): HH Section, Township, Range:
Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Slope (%): 12
Subregion (LRR): SLRA Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Site behind Ayers Crematorium

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	___ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5x5)			
1.	x		
2.			
3.			
4.			
5.			
	13 = Total Cover		
Herb Stratum (Plot size: 5x5)			
1. Anthoxanthum odoratum	80	x	FACU
2. Hypochaeris radicata	15		FACU
3. Conium maculatum	2		FACW
4. Lathyrus latifolius	2		NL
5. Holcus lanatus	1		FAC
6.			
7.			
8.			
9.			
10.			
11.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	___ = Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	___	x 1 =	___
FACW species	___	x 2 =	___
FAC species	___	x 3 =	___
FACU species	___	x 4 =	___
UPL species	___	x 5 =	___
Column Totals:	___ (A)		___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:5' Site behind Ayers Crematorium

SOIL

Sampling Point:

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-18	7.5 yr 3/2	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** X

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

Remarks:

APPENDIX I. Eelgrass Map

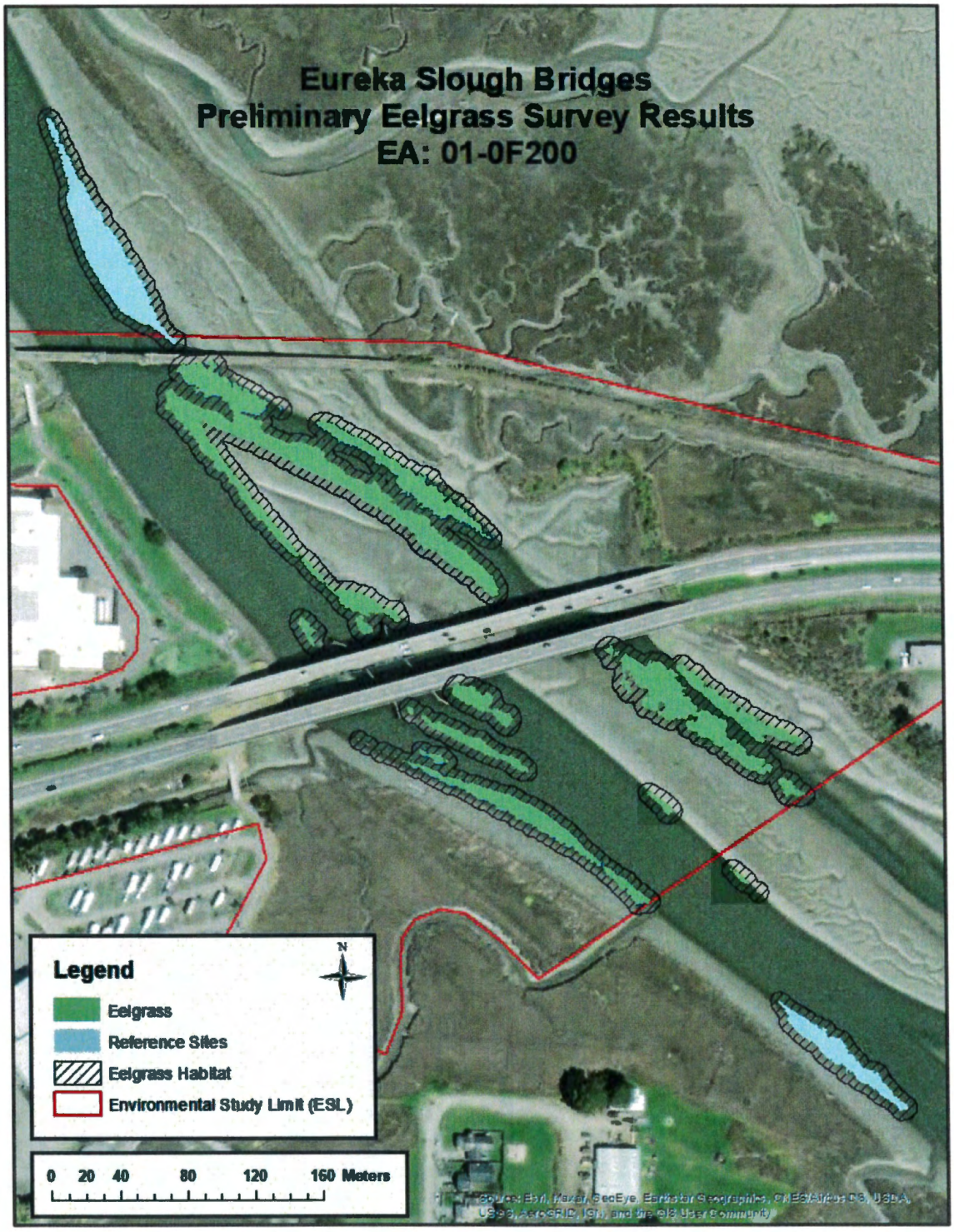


Figure 2. Spatial Distribution. The spatial distribution of eelgrass within the ESL. Vegetated cover is displayed in green with surrounding eelgrass habitat displayed with black hatch lines. The surveyed potential reference sites are displayed in blue. The ESL boundary is displayed in red.

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Making Conservation a California Way of Life

To: Felicia Zimmerman
Associate Environmental Planner
North Region Environmental

Date: March 10, 2023

File: Eureka Slough Bridges
Geotechnical Exploration
01-HUM-101 / PMs 79.5 / 80.2
01-0F200 / 0115000088

From: Christine Hamilton
Environmental Scientist
North Region Environmental

SUBJECT: ADDENDUM TO EUREKA SLOUGH BRIDGES GEOTECHNICAL EXPLORATION NATURAL ENVIRONMENT STUDY

The California Department of Transportation (Caltrans) proposes to conduct a geotechnical investigation to support the design and construction of two to three bridges to replace the existing northbound and southbound bridges crossing Eureka Slough. The project is located in Humboldt County, U.S. Highway 101, between post miles (PMs) 79.5 and 80.2.

The impacts on wetlands and Waters of the U.S. and State from the geotechnical exploration are re-analyzed herein to align better with the permitting requirements and information needs for the required permits. This impacts evaluation supersedes the one included in the Eureka Slough Bridges Geotechnical Exploration Natural Environment Study (NES). Because coastal wetlands are considered an Environmentally Sensitive Habitat Area (ESHA) by the California Coastal Commission, these impact estimates apply to the ESHA impacts analysis as well.

No new mapping or delineations beyond those that were done for the NES were conducted for this analysis. We re-interpreted the project actions that would potentially result in temporary and permanent impacts. We considered access routes in wetlands to be a temporary impact (despite use of wetland protection mats), and determined that backfilling the boring holes would not be considered a permanent impact because they would be capped with native soils (top 5 feet) in wetlands, and with clay mixture in the estuarine/marine deepwater channel, and as such there would be no meaningful loss of wetlands or waters.

The project would require a Section 404 Nationwide Permit 6 from U.S. Army Corps of Engineers, a Section 401 Water Quality Certification from the North Coast Regional Water Quality Control Board, a 1602 Lake or Streambed Alteration Agreement from California Department of Fish and Wildlife, and a Coastal Development Permit (CDP) or CDP waiver from the California Coastal Commission.

WETLANDS AND WATERS IMPACTS

Temporary impacts of up to approximately 0.158 acre of wetlands would occur during the geotechnical drilling from the access pathways using a track-mounted drill rig to drive to three of

the boring holes (8-foot wide wetland protection mats would be placed under the rig), and from disturbance around each of the four boring holes (0.02 acre per boring hole) that are within or adjacent to wetlands (Table 1). Potential temporary impacts include minor compaction or disturbance of wetland vegetation and soils. No excavation, grubbing, or vegetation removal would occur, except for minor trimming of bushes or limbs. No access roads or platforms would be graded or built, no gravel or soils would be imported. The only equipment that would be driven or operated within the wetlands is the 7-foot-wide track-mounted drill rig, using 8-foot-wide wetland protection mats underneath the rig to protect the wetlands. Staging areas and all other vehicles and equipment required for work within wetlands would be placed on the adjacent highway or shoulders. A minor amount of trimming of bushes or limbs may occur for the access pathways as needed. It is anticipated that minor impacts to wetland vegetation and soils would not be visible by the following year.

Table 1. Temporary Impacts to Wetlands and Waters from Geotechnical Exploration

Site ID	Aquatic Resource Type	Access Disturbance (Linear Feet)	Access Disturbance (Acres)	Boring Hole Disturbance (Acres)
B-3	Estuarine Emergent Wetland	137	0.026	0.02
B-21	Estuarine Emergent Wetland	137	0.026	0.02
B-22	Estuarine Emergent Wetland/ Palustrine Emergent Wetland	137	0.026	0.02
B-18	Estuarine Emergent Wetland	0	0	0.02
Total		**411**	**0.078**	**0.08**
Total Area of Temporary Wetland Impacts			**0.158 acre**	

No permanent impacts would occur from backfilling 14, 5-inch-diameter boring holes upon completion of geotechnical drilling. The four boring holes within wetlands would be filled with cement grout, with the top 5 feet filled with native soils. The 10 boring holes in the estuarine/marine deepwater channel (drilled though the bridge deck) would be backfilled with concrete, with the top 20 feet of the hole filled with a non-toxic bentonite clay mixture.

Memorandum

Making Conservation a California Way of Life

To: Felicia Zimmerman
Associate Environmental Planner
North Region Environmental

Date: February 15, 2023

File: Eureka Slough Bridges
HUM-101 / PMs 79.50-80.20
EA 01-0F200 / EFIS 0115000088

From: Caity Bishop
Associate Environmental Planner (Archaeology)
Cultural Resources North 03-4313
North Region Environmental

SUBJECT: 01-0F200 EUREKA SLOUGH BRIDGES, GEOTECHNICAL INVESTIGATION

PROJECT DESCRIPTION

The California Department of Transportation (Caltrans) is proposing geotechnical investigations to support the design and construction of two to three bridges. These proposed bridges would replace the existing northbound and southbound bridges crossing Eureka Slough, between PMs 79.50 and 80.20 on U.S. Highway 101 in Humboldt County. This geotechnical investigation would include geophysical surveys, geotechnical drilling, and compression (P) and shear wave (S) or PS suspension logging. At most, six geophysical surveys would be conducted with each survey line spanning approximately 200 to 500 feet in length. Geotechnical drilling will be used to assess the geotechnical subsurface conditions in the vicinity of the project structures, such as the bridge alignments or the proposed foundation locations. For this investigation, twenty-two borings are proposed using mud-rotary drilling methods. The estimated maximum depth for the 4.75"-diameter vertical borings would be around 200 feet below ground surface. Following this drilling, downhole PS suspension logging would be potentially conducted on two borings which would enable direct measurement of compression wave (P) and shear wave (S) velocities of the surrounding rock and soils until in the subsurface.

Regulatory Setting

The studies for this undertaking were carried out in a manner consistent with Caltrans' regulatory responsibilities under Section 106 of the National Historic Preservation Act (36 CFR Part 800) and pursuant to the *January 2014 First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding*

Compliance with Section 106 of the National Historic Preservation Act (Section 106 PA), and under Public Resources Code Section 5024 and Governor's Executive Order W-26-92 and pursuant to the *Memorandum of Understanding between the California Department of Transportation and the California State Historic Preservation Office Regarding Compliance with Public Resources Code Section 5024 and Governor's Executive Order W-26-92* (January 1, 2015) (MOU) and executed by FHWA and Caltrans. In addition, the project is subject to state historic preservation laws and regulations set forth in the California Environmental Quality Act (PRC § 21000 et seq.).

In accordance with Stipulation VII and Attachment 2 of the PA, I have conducted a review of the proposed project to assess its potential to affect historic resources and have determined this project is exempt from further review or consultation.

Screening Methods

The cultural resources review was conducted by Caity Bishop (PQS To be Determined). Research included, but was not limited to, the following sources and databases:

- Archaeological Survey Report for the Eureka Slough Bridges Project, U.S. Highway 101 101, Humboldt County, California
- 01-0F200 Eureka Slough Bridges Replacement Project APE Map
- Results of Extended Phase I Geoarchaeological Exploration for the Eureka Slough Bridges Replacement Project, U.S. Highway 101, Humboldt County, California
- Eureka Slough Bridges Replacement Project Geotech Layout
- 0F200 Eureka Slough Bridges Replacement Project, Geotech Project Description 11-17-22
- Caltrans Cultural Resource Database

Study Findings

There are no cultural resources in the project area for the geotechnical investigation. The Caltrans right of way has been previously surveyed and subjected to Extended Phase I archaeological investigations. There are no historical built-environment elements in the project area. Geoarchaeological data indicated there is a moderate to high sensitivity for surface and buried resources in the geotechnical investigation area. If the proposed investigation plans are

changed to include new areas or additional test holes, new cultural studies will be required, and archaeological monitoring may be required.

Screened Undertaking Classification

This project falls under Stipulation VII of the PA and is a "*screened undertaking*," as identified in Attachment 2. The following classes pertain to this project:

- Class 29 "Preliminary engineering tests, such as seismic, geologic, or hazardous materials testing that involve buildings or structures or require trenching and ground boring."

Conclusion

In accordance with the Section 106 PA, this undertaking is determined to be a *screened undertaking* with no potential to affect historic properties. The undertaking is **exempt from further review or consultation under Section 106**, and **the project is exempt from further review under PRC 5024**. This memorandum documents compliance with the agreed upon historic preservation procedures. No further cultural resources work is required unless project plans change to include work not currently identified in the project description or to include additional areas not identified in current project plans.

If you have any questions, please do not hesitate to contact me at (707) 492-0210 or Caitlin.Bishop@dot.ca.gov. This screening memo was completed under the supervision of Tim Keefe, Senior Environmental Planner, Cultural Resources, whose contact is (707) 572-7084 or Timothy.Keefe@dot.ca.gov.

Sincerely,

Caity Bishop

CAITY BISHOP, Associate Environmental Planner-Archaeologist
North Region Environmental–District 1
Cultural Resources–North

Timothy Keefe

TIMOTHY KEEFE, Senior Environmental Planner, Branch Chief
North Region Environmental–District 1
Cultural Resources–North

Attachments: Geotechnical Boring Plan Map

Memorandum

Making Conservation a California Way of Life

To: Robert Tshiunza, PE
Project Engineer
North Region Design M15

Date: December 19, 2022

File: Eureka Slough Bridges
HUM-101 PM 79.5/80.2
01-0F200 / 01 1500 0088

From: Paul Sundberg, PG
Engineering Geologist - Hazardous Waste/Paleontology Coordinator
North Region Environmental
Office of Environmental Engineering - North

SUBJECT: INITIAL SITE ASSESSMENT

An Initial Site Assessment (ISA) was conducted for the "Eureka Slough Bridges" replacement project as requested. The purpose of this project is to address seismic deficiencies as well as improve the function and geometrics of the Eureka Slough Bridges to ensure uninterrupted traffic movement in the event of a collision or emergency incident, earthquake or any other catastrophic event. Replacement structures built to current standards with separated pedestrian pathways would promote and enhance mobility for all modes of transportation. The southbound structure, built in 1943, has seismic deficiencies, is fracture critical and has a non-standard profile which contributes to a collision rate at the bridge departure that is double the statewide average for similar facilities. The northbound structure, built in 1956, also has seismic deficiencies and has non-standard bridge rails built on raised concrete curbs within the shoulders. Both structures have exceeded their design life and have narrow shoulders that impede multimodal transportation.

The Eureka Slough Bridges project would address seismic, geometric, and functional deficiencies in the northbound and southbound Eureka Slough Bridges. Alternatives 2 and 3 propose to replace the NB and SB structures with new structures that each have two traffic lanes, standard inside and outside shoulders, and a separated bicycle/pedestrian path.

The Office of Geotechnical Design West (OGDW) proposes to conduct a geotechnical investigation of subsurface conditions to support the design and construction of the proposed bridges. The geotechnical investigation of subsurface conditions would include drilling and performing geophysical surveys. Drilling would be performed on the proposed bridge alignments at or near the proposed foundation locations. To adequately characterize and evaluate these conditions in the area of the proposed structure foundations, we propose to perform a staged investigation in the following order: 1) geophysical surveys, 2) geotechnical drilling, and 3) PS suspension logging.

The ISA found that the project has minor hazardous waste issues.

A Preliminary Site Investigation (PSI) was conducted in April of 2020 and identified Aerially Deposited Lead (ADL) at regulated concentrations in shoulder soils and in the soils below the bridge foundation elements. The PSI found that soils excavated from the surface to a depth of 2.5 feet or shallower would be considered California hazardous. For exploration activities adjacent to the highway, a copy of this PSI can be provided upon request.

This office performed a review of historical aerial imagery to assess past commercial/industrial activities at the site. A Montgomery Ward building was constructed in the early 1960s on the north side of 4th street, on the property that is currently occupied by Target. The area south of 5th street which is currently occupied by a Harley Davidson dealership, a gas station, an RV Park, and Humboldt County offices, was first developed in 1936 with the Travelers Rest Motel, which was accessed via a bridge over First Slough. The gas station and county offices were developed some time between 1956 and 1972, while the RV Park was developed between 1972 and 1983. The Harley Davidson dealership was built between 2005 and 2009. Aside from the construction of the highway and northbound and southbound bridges, as well as the and the above-mentioned developments, the historical aerial image review indicated a lack of previous commercial/industrial activities in the area of proposed geotechnical investigations around the Eureka Slough bridges.

Due to the nature of the proposed geotechnical work, consisting of limited soil disturbance (approximately 8-inch diameter borings) at targeted investigation locations, special management may be required of California hazardous regulated soils which may be encountered in the borings at shallow depths. Worker safety related to lead contaminated soils can be addressed in the activity-specific Health and Safety Plan.

Please note, the ISA found project work is on or adjacent to sites listed on the *Hazardous Waste and Substances Site List (Cortese List)*.

Sites include:

- Montgomery Wards located at 2525 Fourth Street, Eureka, CA 95501 - APN 002-201-008-000 (GeoTracker Global ID: T0602393605; Completed - Case Closed),

- Target Corporation located at 2525 Fourth Street, Eureka, CA 95501 - APN 002-201-008-000 (GeoTracker Global ID: SL0602351190; Completed - Case Closed),

- Big Oil & Tire - Mall 101 BP located at 2480 6th Street, Eureka, CA 95501 - APN 002-252-022-000 (GeoTracker Global ID: T0602300453; Completed - Case Closed), and

Exploratory borings are proposed on the former Montgomery Wards /current Target property. The site received a No Further Action (NFA) letter from the California Regional Water Quality Control Board - North Coast Region (NCRWQCB) in August of 2007 stating that no further action was required related to the cleanup of contaminant discharges and underground storage tank(s) at the site.

No exploration activities are proposed on the Big Oil & Tire property. The site received a Remedial Action Completion Certification (RACC) from the Humboldt County Department of Health and Human Services - Division of Environmental Health in July of 2011 stating that no further action was required related to petroleum release(s) from the underground storag tank at the site.

Contaminate release and subsequent cleanup activities at the above-mentioned sites are not within the area of proposed geotechnical explorations. It is unlikely that petroleum hydrocarbons will be encountered during drilling operations. Therefore, no special handling of soil and/or groundwater encountered in the exploratory borings, with respect to petroleum hydrocarbons, is anticipated during the geotechnical exploration activities, should they be encountered.

If there are any changes to the scope of the project, please send an e-mail or phone the District Hazardous Waste Coordinator at (707) 572-8048 describing the changes so that an evaluation can be made for possible hazardous waste issues that could affect your project.

Sincerely,

Paul R. Sundberg, PG
Engineering Geologist – Hazardous Waste / Paleontology Coordinator
Caltrans North Region Environmental, District 1
Office of Environmental Engineering – North

cc: 1-PSundberg
2-RTshiunza
3-LMorales
4-FZimmerman
5-JMeyer
6-File

PRS:cf

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

March 28, 2023 **Refer to NMFS No: WCRO-2023-00340**

Jason Meyer
Chief, Branch E3
North Region Environmental
Caltrans, District 1
1656 Union Street
Eureka, California 95501

Re: Endangered Species Act Section 7(a)(2) Concurrence Letter and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Eureka Slough Bridges Geotechnical Investigation Project (EA 01-0F200)

Dear Mr. Meyer:

On March 21, 2023, NOAA's National Marine Fisheries Service (NMFS) received your request for written concurrence that the California Department of Transportation's (Caltrans[1]) Eureka Slough Bridges Geotechnical Investigation Project (project) is not likely to adversely affect species listed as threatened or endangered, or critical habitats designated under the Endangered Species Act (ESA).

This response to your request was prepared by NMFS pursuant to section 7(a)(2) of the ESA and implementing regulations at 50 CFR 402. On July 5, 2022, the U.S. District Court for the Northern District of California issued an order vacating the 2019 regulations that were revised or added to 50 CFR part 402 in 2019 ("2019 Regulations," see 84 FR 44976, August 27, 2019) without making a finding on the merits. On September 21, 2022, the U.S. Court of Appeals for the Ninth Circuit granted a temporary stay of the district court's July 5 order. On November 14, 2022, the Northern District of California issued an order granting the government's request for voluntary remand without vacating the 2019 regulations. The District Court issued a slightly amended order two days later on November 16, 2022. As a result, the 2019 regulations remain in effect, and we are applying the 2019 regulations here. For purposes of this consultation and in an abundance of caution, we considered whether the substantive analysis and conclusions articulated in the letter of concurrence would be any different under the pre-2019 regulations. We have determined that our analysis and conclusions would not be any different.

Thank you also for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management

[1] Pursuant to 23 USC 327, and through a series of Memorandum of Understandings beginning June 7, 2007, the Federal Highway Administration (FHWA) assigned and Caltrans assumed responsibility for compliance with Section 7 of the federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for federally-funded transportation projects in California. Therefore, Caltrans is considered the federal action agency for consultations with NMFS for federally funded projects involving FHWA. Caltrans proposes to administer federal funds for the implementation of the proposed action, and is therefore considered the federal action agency for this consultation.

Act (MSA) (16 U.S.C. 1855(b)) for this action. We agree with your determination that the project will adversely affect EFH and we have provided one EFH conservation recommendation.

This letter underwent pre-dissemination review using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available within two weeks at the Environmental Consultation Organizer [https://www.fisheries.noaa.gov/resource/tool-app/environmental-consultation-organizer-eco]. A complete record of this consultation is on file at Northern California Office in Arcata, CA.

CONSULTATION HISTORY

On multiple occasions between 2014 and 2017, NMFS fish biologist Mike Kelly visited the project location while he was an employee of Caltrans' Local Assistance program working on environmental compliance for segments of the Humboldt Bay Trail project.

On January 13, 2022; April 6, 2022; January 11, 2023; and March 7, 2023, Caltrans hosted multi-agency meetings to discuss the larger Eureka Slough Bridges Replacement Project, which included information relevant to the geotechnical investigations that are the subject of this consultation.

On October 10, 2022, Mike Kelly and Caltrans biologist Christine Hamilton discussed the geotechnical investigations project and potential effects to ESA-listed species, their critical habitat, and EFH.

On January 26, 2023, Caltrans biologist Christine Hamilton obtained an official species list for this location using the NMFS California Species List Tool in Google Earth.

On March 9, 2023, Christine Hamilton provided a draft biological assessment (BA) for the project.

Between March 14 and March 16, 2023, Mike Kelly and Christine Hamilton exchanged a series of emails with Caltrans geotechnical and hydroacoustics engineers to clarify the core sampling impact hammering portion of the project.

On March 15, 2023, Mike Kelly and Christine Hamilton met with Caltrans' hydroacoustic engineer Ryan Pommerenck to discuss the hydroacoustic analysis for the impact hammering portion of the project.

On March 20, 2023, Mike Kelly provided comments on the draft BA.

On March 21, 2023, Christine Hamilton provided an updated BA and a letter dated March 14, 2023, requesting informal consultation. Mike Kelly replied that informal consultation would begin on March 21, 2023.

PROPOSED ACTION AND ACTION AREA

Caltrans proposes to conduct geotechnical investigations to help inform foundation design for the future replacement of the Eureka Slough Bridges on U.S. Highway 101 between post miles 79.5 and 80.2 in Eureka, California. The investigation techniques that may affect ESA-listed species or their critical habitats include on-land seismic surveys, and drilling for soil samples through the

bridge decks into the Eureka Slough bottom. Other investigative elements will occur; however, Caltrans has determined that only the seismic surveys, and drilling and sampling in the slough may affect species and habitats that are the subject of this consultation. Therefore, the remainder of this letter only address potential impacts from those portions of the project. Caltrans' BA (Caltrans 2023) describes the project in detail.

Seismic survey equipment consists of an array of 24 geophone sensors, which are copper stakes driven into the ground and connected by a multi-electrode cable to a battery powered seismograph unit. The geophones detect a seismic energy source, which may be one of three sources described below. Three seismic refraction surveys will be conducted in salt marsh adjacent to Eureka Slough and would take no more than six days to complete (two days per seismic line). This work could occur at any time during the year.

Seismic energy sources would consist of either a hammer and striker plate, a downhole shotgun, or small explosives. The hammer and striker plate noise occurs when a 12- to 16-pound sledgehammer strikes a plate resting on the ground surface. The downhole shotgun uses an eight gauge, 350 to 500-grain blank shotgun cartridge, which is fired into a water-filled hole created with a hand auger to a minimum depth of 1.5 feet. The shells are typically triggered 20 minutes apart. The explosive devices are small binary charges ranging between 1/6 and 1/3 of a pound. The charges would be placed by a licensed blaster into a hole two to three feet deep bored with a hand auger. The charges would be triggered approximately 30 minutes apart.

The shotgun or explosive method would most likely be required in order to achieve the desired results due the soft substrate expected in the project area. Typically, shotgun blasts and explosive charges would be limited to about nine per day. Additional shots may be required if desired results are not achieved. Seismic lines would be placed as close as 20 feet to the edge of water, and the seismic survey will generate vibration in the substrate that could radiate into the water column.

Ten geotechnical borings and core sampling operations will occur in slough water through the bridge decks over a 16-week period between June 15 and October 15. Each boring will be to approximately 100 feet. Equipment will include a track or truck-mounted drill rig equipped with a Standard Penetration Test (SPT) hammer, and a water truck. The SPT hammer operation takes three six-inch samples every five feet by pounding a sampling tube. Soft soil is expected in the first 40 feet and harder soil is expected as drilling depth increases.

It will take two days to drill each bore hole to 100 feet. The first day's operation will drill and sample to approximately 60 feet, and the second day's drilling and sampling would advance approximately 40 feet to complete the100-foot bore. The following details expected two-day operations:

Day one

Upper 40 feet

There will be approximately two blows per sample with three samples and eight SPT hammering intervals (totaling 48 blows) with approximately 20 minutes between hammering intervals.

40 feet to 60 feet

There will be approximately five blows per sample with three samples and four SPT hammering intervals (totaling 60 blows) with approximately 40 minutes between hammering intervals.

Day two

60 feet to 100 feet

There will be approximately 20 blows per sample with three samples and eight SPT hammering intervals (totaling 480 blows) with approximately 60 minutes between hammering intervals.

During drilling, a casing will contain the drilling auger, spoils, and a drilling lubrication fluid. After the completion of each boring, soil cuttings and drilling fluid generated by the operation will be pumped and/or shoveled into 55-gallon drums for hazardous waste characterization and disposal. Any cuttings and/or drilling fluid inadvertently spilled onto the bridge deck will be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean pavement surfaces, a minimal amount would be used and as much of the impacted water will be captured as practical.

The boring holes in the slough will be backfilled with cement to within 20 feet of the surface, and the top 20 feet will be filled with a non-toxic bentonite clay mixture.

The following best management practices (BMPs) will be implemented to minimize or avoid impacts to species and habitats:

- Before geotechnical activities begin, the project's environmental coordinator or biologist will discuss the implementation of the required BMPs with the resident engineer and contractor, and will identify and document environmentally sensitive areas and potential occurrence of listed species.
- Drilling fluid will be made up of water, or water mixed with bentonite clay without additives. Drilling would be conducted inside a casing so that all spoils are recoverable in a collection structure. All drilling fluids and materials would be self-contained and removed from the site after use in accordance with Caltrans Drilling Services Quality Management Plan (Caltrans 2019a).
- BMPs will be implemented as appropriate to control on-site and offsite releases from geotechnical drilling operations. In the event of a fluid spill, drilling will cease immediately to allow for containment and clean-up.
- Plastic tarps, absorption mats, and straw or jute wattles will be employed to contain possible leaks from drilling operations or equipment.
- Potential leakage at the casing mud-line contact will be monitored. If leakage is detected, the lubricated drilling will be stopped and the casing will be advanced by dry drilling to a depth at which leakage has stopped and is sealed off.
- Maintenance and fueling of equipment and vehicles will occur at least 15 meters from the edge of water.

- Equipment will be inspected on a daily basis for leaks and completely cleaned of any external petroleum products, hydraulic fluid, coolants, and other materials prior to operating equipment.

We considered, under the ESA, whether or not the project would cause any other activities and determined that it would not. The geotechnical investigations are intended to support design of an eventual replacement of the bridges; however, the bridge replacement project will undergo separate section 7 consultation.

Action Area

The project's action area encompasses the entire construction footprint subject to impacts from substrate disturbance, the areal extent of any turbidity, and the area over which production of sound that may produce behavioral changes or accumulate to a level that could injure exposed ESA-listed fish. The action area also includes on-land drilling and areas of other geotechnical investigative techniques, as well as staging, maintenance, and access areas.

BACKGROUND AND ACTION AGENCY'S EFFECTS DETERMINATION

Available information indicates the following listed species (Evolutionarily Significant Units [ESU] or Distinct Population Segments [DPS]) under the jurisdiction of NMFS may be affected by project activities:

Southern Oregon/Northern California Coast (SONCC) coho salmon ESU
(*Oncorhynchus kisutch*)
Threatened (70 FR 37160; June 28, 2005)
Critical habitat (64 FR 24049; May 5, 1999)

California Coastal (CC) Chinook salmon ESU
(*O. tshawytscha*)
Threatened (70 FR 37160; June 28, 2005)
Critical habitat (70 FR 52488; September 2, 2005)

Northern California (NC) steelhead DPS
(*O. mykiss*)
Threatened (71 FR 834; January 5, 2006)
Critical habitat (70 FR 52488; September 2, 2005)

North American green sturgeon Southern DPS (SDPS)
(*Acipenser medirostris*)
Threatened (71 FR 17757; April 7, 2006)
Critical habitat (74 FR 52300; October 9, 2009)

Caltrans determined that the project may affect, but is not likely to adversely affect SONCC coho salmon, CC Chinook salmon, NC steelhead, or North American green sturgeon SDPS. Caltrans also determined that the project may affect, but is not likely to adversely affect critical habitat for these species.

Life History of Listed Species and Use of Action Area

SONCC Coho Salmon

Coho salmon have a generally simple 3-year life history. The adults typically migrate from the ocean towards their freshwater spawning grounds in late summer and fall, and spawn by mid-winter. Adults die after spawning. The eggs are buried in nests, called redds, in the rivers and streams where the adults spawn. The eggs incubate in the gravel until fish hatch and emerge from the gravel the following spring as fry. These 0+ age fish typically rear in fresh water for about 15 months before migrating to the ocean. The juveniles go through a physiological change during the transition from fresh to salt water called smoltification. Coho salmon typically rear in the ocean for two growing seasons, returning to their natal streams as 3-year-old fish to renew the cycle. During the proposed work window, juveniles could use portions of the action area in low numbers as water quality conditions in the action area during the summer months is of marginal quality and reaches unsuitable temperatures for coho rearing (Wallace 2006; Wallace and Allen 2007, 2012; Wallace et al. 2018.) Therefore, any juvenile coho salmon in the action area during summer would likely be migrating through and not holding or rearing.

CC Chinook Salmon

The CC Chinook salmon ESU are typically fall spawners, entering their natal streams in the early fall. The adults tend to spawn in the mainstem or larger tributaries of rivers. As with the other anadromous salmon, the eggs are deposited in redds for incubation. When the 0+ age fish emerge from the gravel in the spring, they typically migrate to salt water shortly after emergence. Therefore, Chinook salmon typically enter the estuary as smaller fish compared to coho salmon. Chinook salmon are typically present in the stream-estuary ecotone from early May to early September, with peak abundance in June/July (Wallace and Allen 2007). Similar to coho salmon, prey resources during out-migration is critical to Chinook salmon survival as they grow and move out to the open ocean. During the proposed work window, juveniles could use portions of the action area in low numbers as water quality conditions in the action area during the summer months is of marginal quality and reaches unsuitable temperatures for coho rearing (Wallace 2006; Wallace and Allen 2007, 2012; Wallace et al. 2018). Therefore, any juvenile Chinook salmon in the action area during summer would likely be migrating through and not holding or rearing.

NC Steelhead

Steelhead exhibit the most complex suite of life history strategies of any salmonid species. They have both anadromous and resident freshwater life histories that can be expressed by individuals in the same watershed. The anadromous fish generally return to fresh water to spawn as 4- or 5-year-old adults. Unlike other Pacific salmon, steelhead can survive spawning and return to the ocean to return to spawn in a future year. It is rare for steelhead to survive more than two spawning cycles. Steelhead typically spawn between December and May. Like other Pacific salmon, the steelhead female deposits her eggs in a redd for incubation. The 0+ age fish emerge from the gravel to begin their freshwater life stage and can rear in their natal stream for 1 to 4 years before migrating to the ocean.

Steelhead have a similar life history as noted above for coho salmon, in the sense that they rear in fresh water for an extended period before migrating to salt water. As such, they enter the estuary as larger fish (mean size of about 170 to 180 mm or 6.5 to 7.0 inches) and are, therefore, more oriented to deeper water channels in contrast to Chinook salmon that typically enter the estuary as 0+ fish. California Department of Fish and Wildlife (CDFW) data indicate that steelhead smolts generally migrate downstream toward the estuary between March 1 and July 1

each year, although they have been observed as late as September (Ricker et al. 2014). The peak of the outmigration timing varies from year to year within this range, and generally falls between early April and mid-May. During the proposed work window, juveniles could use portions of the action area in low numbers as water quality conditions in the action area during the summer months is of marginal quality and reaches unsuitable temperatures for coho rearing (Wallace 2006; Wallace and Allen 2007, 2012; Wallace et al. 2018.) Therefore, any juvenile steelhead in the action area during summer would likely be migrating through and not holding or rearing.

SDPS Green Sturgeon

SDPS green sturgeon inhabit estuaries along the west coast during the summer and fall months (Moser and Lindley 2007) and are known to use North Humboldt Bay heavily (Goldsworthy et. al. 2016; Pinnix 2008). Juvenile SDPS green sturgeon rear in their natal streams in California's Central Valley, so only sub-adult and adult SDPS green sturgeon are present in Humboldt Bay and are the only life stages of SDPS green sturgeon that could be exposed to the effects of the Project. Sub-adults range from 65-150 cm total length from first ocean entry to size at sexual maturity. Sexually mature adults range from 150-250 cm total length.

The action area is located in the Eureka Slough channel leading to North Bay, where SDPS green sturgeon are known to occur during summer months. Most SDPS green sturgeon are expected to reside in the high use area of North Bay, as described by Goldsworthy et al. 2016 and Pinnix et al. 2008, but may enter the action area while actively feeding.

ENDANGERED SPECIES ACT

Effects of the Action

Under the ESA, "effects of the action" are 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 (50 CFR 402.02). In our analysis, which describes the effects of the proposed action, we considered 50 CFR 402.17(a) and (b). When evaluating whether the proposed action is not likely to adversely affect listed species or critical habitat, NMFS considers whether the effects are expected to be completely beneficial, insignificant, or discountable. Completely beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Effects are considered discountable if they are extremely unlikely to occur.

The direct effects of the proposed action include brief periods of turbidity during initial setting of the casing and drilling; elevated sound pressure levels during seismic surveys and SPT hammer operation; and potential for contaminants and bentonite clay slurry entering the waterway. Discharges of drilling fluid are not common; however, we cannot discount the possibility that one or more discharges may occur.

Turbidity

Turbidity excursions resulting from drilling operations at 10 locations are expected to be brief as the drill casing initially penetrates the slough bottom, and the plume will be restricted to a small area before it settles or disperses. Given the size and duration of any turbidity plume, ESA-listed fish that may be in the action area would be able to avoid a plume, and there is ample habitat within and outside the action area. Therefore, we expect that any exposure to turbidity generated by the project would be insignificant.

Additionally, minor turbidity plumes are not expected to change depths or values of critical habitat.

Drilling Fluid Discharge

Any discharge of non-toxic bentonite clay drilling fluid will be carefully monitored and would be detected and sealed before any significant quantity is discharged. Because there is only a small chance that a discharge would occur, and a very small chance that an ESA-listed fish would be in the small area of discharge, we conclude that the chances of exposure to the bentonite clay before it settles is extremely unlikely and discountable.

Additionally, any drilling fluid discharges are not expected to change depths or values of critical habitat.

Seismic Survey Sound

No underwater noise data is available for seismic surveys to evaluate effects on fish. However, Caltrans selected surrogate data from monitoring impact driving of 12-inch square concrete piles at Haehl Creek, Willits, California as reported in Caltrans' Technical Guidance for Assessment and Mitigation of the Hydroacoustic Effects of Pile Driving on Fish (Caltrans 2020). Caltrans chose this example because they believe it most likely represents conservative sound energy levels produced by seismic surveys at 20 feet from water. We agree that this is an appropriately conservative example.

The peak sound pressure level at Haehl Creek was 176dB (decibels re: 1 μPa), which is well below the single strike injury threshold of 206dB. Therefore, we expect exposure of salmonids and green sturgeon to the single strike injury threshold to be extremely unlikely and discountable.

We expect that any ESA-listed fish in the action area during summer would weigh over two grams; therefore, the 187dB accumulated sound exposure level (cSEL) injury threshold is the appropriate measure. Data analysis described in Caltrans' BA demonstrates that the cSEL injury threshold will not be exceeded with the proposed nine explosive or hammer strikes per day. In fact, the cSEL injury threshold would not be reached in the water regardless of how many strikes were conducted in a single day. Therefore, exposure of ESA-listed fish to the cSEL injury threshold during seismic investigations is extremely unlikely and discountable.

The behavioral sound pressure threshold of 150dB may be exceeded up to 54 meters from the seismic survey locations, which would extend approximately 48 meters into slough water. Fish exposed to the 150dB behavioral threshold may react with initial startling. Resulting effects would be insignificant because salmonids would likely be transiting through the action area and return to normal behavior quickly, and any green sturgeon feeding in the area would not be

expected to remain in the behavioral threshold zone for long enough to affect their fitness or survival due to interrupted feeding.

SPT Hammer Core Sampling

Caltrans provided a hydroacoustic analysis based on monitoring data for similar core sampling and SPT hammer operation conducted in Puget Sound, Washington (Caltrans 2019b). Operation of the SPT hammer is expected to cause levels of sound that will not exceed the single strike threshold for injury of 206dB. However, the 187dB accumulated sound exposure level (cSEL) is predicted to be exceeded at one meter from the drill casing during 10 days when sampling occurs to 60 feet deep, and to two meters on 10 days when sampling occurs to 100 feet. Additionally, the behavioral threshold of 150dB is predicted to extend to 34 meters from the drill casing.

NMFS expects that an individual fish would have to be exposed to elevated sound pressures over the course of several hours in a day in order to accumulate enough sound energy to experience the cSEL injury threshold. Because the cSEL radius is likely to extend a maximum of two meters from the casing with frequent breaks of 20 to 60 minutes, and because we do not expect any ESA-listed fish to linger within two meters of the casing, exposure to the cSEL injury threshold is extremely unlikely and discountable. Additionally, fish that may be exposed to elevated sound pressure levels below injury thresholds are known to fully recover after 12 hours, so no fish would experience accumulated sound pressure adding up to the cSEL injury threshold over multiple days.

Fish exposed to the 150dB behavioral threshold within 34 meters of the casing may react with initial startling. Resulting effects would be insignificant because salmonids would likely be transiting through the action area and return to normal behavior quickly, and any green sturgeon feeding in the area would not be expected to remain in the behavioral threshold zone for long enough to affect their fitness or survival due to interrupted feeding.

There is eelgrass in the action area. Caltrans predicts that eelgrass will not be disturbed based on current conditions and location of eelgrass. However, we believe that we cannot completely discount the possibility that eelgrass may exist at the time of construction in areas closer to shallows, which appear to include up to four areas of drilling. The drill casings used for this type of sampling are typically two to five inches in diameter (Caltrans 2019b). Therefore, the disturbance created by the drill casing is likely to cover a radius of less than one foot depending on how carefully it is placed, so any eelgrass impacted is expected to recover relatively quickly, and NMFS expects effects to this element of critical habitat to be insignificant.

Conclusion

Based on this analysis, NMFS concurs with Caltrans that the proposed action is not likely to adversely affect the subject listed species and designated critical habitats.

Reinitiation of Consultation

Reinitiation of consultation is required and shall be requested by Caltrans, or by NMFS, where discretionary Federal involvement or control over the action has been retained or is authorized by law and (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (2) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat

that was not considered in this concurrence letter; or (3) a new species is listed or critical habitat designated that may be affected by the identified action (50 CFR 402.16). This concludes the ESA consultation.

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. Under the MSA, this consultation is intended to promote the conservation of EFH as necessary to support sustainable fisheries and the managed species' contribution to a healthy ecosystem. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity," and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10). Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects may result from actions occurring within EFH or outside of it and may include direct, indirect, site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) of the MSA also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH. Such recommendations may include measures to avoid, minimize, mitigate, or otherwise offset the adverse effects of the action on EFH (50 CFR 600.905(b)).

Habitat Areas of Particular Concern (HAPC) are described in the regulations as subsets of EFH that are identified based on one or more of the following considerations: the importance of the ecological function provided by the habitat; the extent to which the habitat is sensitive to human-induced environmental degradation; whether, and to what extent, development activities are, or will be stressing the habitat type; and the rarity of the habitat type (50 CFR 600.815(a)(8)). Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process.

Many species managed by the Pacific Coast Groundfish Fisheries Management Plan (FMP) could be present in the work area, including: spiny dogfish shark, leopard shark, English sole, starry flounder, juvenile lingcod, juvenile rockfish, and others. Coastal Pelagic Species that could be in the work area include northern anchovy, jack mackerel, and Pacific sardine.

NMFS determined that the proposed action would adversely affect EFH as follows: adverse effects to EFH for the Pacific Salmon FMP were previously described in the ESA portion of this document, and they are essentially the same as would be for the Pacific Coast Groundfish and the Coastal Pelagic Species FMP's. These include elevated sound pressure levels and brief excursion of turbidity.

Adverse effects to EFH for the Pacific Coast Salmon and Pacific Groundfish FMP's include potential of loss of a small area of eelgrass, which is a HAPC. While we believe that there is a low likelihood that drilling will take place in an eelgrass bed, it may be present in up to four areas of drilling where appropriate depths may be present. However, the disturbance by the drill

casing is likely to cover a radius of less than one foot, so any eelgrass impacted is expected to recover relatively quickly.

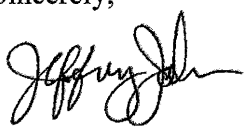
NMFS determined that the following conservation recommendation is necessary to avoid, minimize, mitigate, or otherwise offset the impact of the proposed action on EFH.

> Caltrans shall determine whether drilling disturbs any eelgrass, and shall quantify the total area of disturbance. If eelgrass is disturbed, Caltrans shall monitor the location to determine whether the eelgrass recovers within one year. If the eelgrass does not recover, Caltrans shall consult with NMFS on appropriate mitigation, which will comply with the California Eelgrass Mitigation Policy and Implementing Guidelines (NMFS 2014). Additionally, in areas where eelgrass is disturbed by drilling, Caltrans shall fill the upper three feet of substrate with native slough bottom spoils rather than bentonite clay.

Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may additionally adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendation (50 CFR 600. 920(l)).

Please direct questions regarding this letter to me at Jeffrey.Jahn@noaa.gov or at (707) 825-5173.

Sincerely,



Jeffrey Jahn
Northern California South Coast Branch Supervisor
California Coastal Office

cc: Copy to E-File: FRN 151422WCR2023AR00070
Gregory O'Connell, California Department of Fish and Wildlife

REFERENCES

Caltrans (California Department of Transportation). 2019a. Caltrans Drilling Services Quality Management Plan.

Caltrans. 2019b. Engineering Technical Brief Draft Hydroacoustic Analysis for Geotechnical Drilling and Sampling. TAN-19-01. Prepared by ICF and Caltrans May 2019.

Caltrans. 2020. Technical Guidance for Assessment of Hydroacoustic Effects of Pile Driving on Fish. Prepared by ICF International and Illingworth and Rodkin, Inc. October 2020.

Caltrans. 2023. Biological Assessment for the Eureka Slough Geotechnical Investigation Project. March 2023.

Goldsworthy, M., B. Pinnix, M. Barker, L. Perkins, A, David, and J. Jahn. 2016. Green Sturgeon Feeding Observations in Humboldt Bay, California. Field Note from August 19, 2016. National Marine Fisheries Service, United States Fish and Wildlife Service, Arcata, California.

Moser, M., and S. Lindley. 2007. Use of Washington estuaries by subadult and adult green sturgeon. Environmental Biology of Fishes DOI 10 1007/sl0641-006-9028-1.

NMFS (National Marine Fisheries Service). 2014. California Eelgrass Mitigation Policy and Implementing Guidelines. October 2014.

PFMC (Pacific Fishery Management Council). 1998. The Coastal Pelagic Species Fishery Management Plan Amendment 8 (December 1998). Pacific Fishery Management Council, Portland, Oregon.

PFMC. 1999. Amendment 14 to the Pacific Coast Salmon Plan — Appendix A, Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon (August 1999). Pacific Fishery Management Council, Portland, Oregon.

PFMC. 2014. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. Pacific Fishery Management Council, Portland OR.

Pinnix, W. D., P.A. Nelson, G. Stutzer, and K. Wright. 2008. Residence time and habitat use of coho salmon in Humboldt Bay, California: an acoustic telemetry study. U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata, California.

Wallace, M. 2006. Juvenile Salmonid Use of Freshwater Slough and Tidal Portion of Freshwater Creek, Humboldt Bay, California. 2003 Annual Report. Inland Fisheries Administrative Report 2006-04. California Department of Fish and Game, Sacramento, USA.

Wallace, M., and S. Allen. 2007. Juvenile Salmonid Use of the Tidal Portions of Selected Tributaries to Humboldt Bay, California. June 2007. California Department of Fish and Game and Pacific States Marine Fisheries Commission. Contract P0410504.

Wallace, M., and S. Allen. 2012. Juvenile Salmonid Use of the Tidal Portions of Selected Tributaries to Humboldt Bay, California, 2009-2011. Prepared by the Natural Stocks Assessment Project, California Department of Fish and Game and Pacific States Marine Fisheries Commission. 45 p.

Wallace, M., E. Ojerholm, A. Scheiff, and S. Allen. 2018. Juvenile Salmonid Use and Restoration Assessment of the Tidal Portions of Selected Tributaries to Humboldt Bay, California, 2015-2017. Fisheries Restoration Grant Program Final Report Contract P1310520.