

LAST CHANCE GRADE PHASE 2B GEOTECHNICAL INVESTIGATION

**DEL NORTE COUNTY, CALIFORNIA
DISTRICT 1 – DN – 101 (Post Miles 12.0 to 15.5)
01-0F280/0115000099**

INITIAL STUDY
**with Proposed Negative Declaration
and Proposed Section 4(f) *de minimis* Determination**



**Prepared by the
State of California Department of Transportation**



December 2019



General Information about this Document

What's in this document?

The California Department of Transportation (Caltrans) has prepared this Initial Study with proposed Negative Declaration (IS/ND) and proposed Section 4(f) *de minimis* determination which examines the potential environmental effects of a proposed project on United States Highway 101 (U.S. 101) in Del Norte County, California. Caltrans is the lead agency under the California Environmental Quality Act (CEQA). This document tells you why the project is being proposed, how the existing environment could be affected by the project, the potential impacts of the project, and proposed avoidance, minimization, and/or mitigation measures.

What should you do?

- Please read this document.
- Additional copies of this document are available for review at:
 - Caltrans District 1 Office, 1656 Union Street, Eureka, CA
 - Eureka Library 1313 3rd Street, Eureka, CA
 - Del Norte County Library 190 Price Mall, Crescent City, CA
 - <https://lastchancegrade.com/>
- Attend the public open house on January 8, 2020, at the Del Norte County Fairgrounds in the Floral Building
- We'd like to hear what you think. If you have any comments about the proposed project, please attend the public open house and/or send your written comments to Caltrans by the deadline.
- Please send comments via U.S. mail to:

California Department of Transportation
Attention: Steve Croteau
North Region Environmental–District 1
1656 Union Street
Eureka, CA 95501
- Send comments via e-mail to: steven.croteau@dot.ca.gov
- Be sure to send comments by the deadline: January 16, 2020

What happens after this?

After comments are received from the public and reviewing agencies, Caltrans may (1) give environmental approval to the proposed project, (2) do additional environmental studies, or (3) abandon the project. If the project is given environmental approval and funding is obtained, Caltrans could complete the design and construct all or part of the project.

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please write to or call Caltrans, Attention: Phil Frisbie, Public Information Office—District 1, 1656 Union Street, Eureka, CA 95501; (707) 445-6600 Voice, or use the California Relay Service TTY number, 711 or 1-800-735-2929.

LAST CHANCE GRADE

PHASE 2B GEOTECHNICAL INVESTIGATION

Geotech Drilling in support of the Last Chance Grade Permanent Restoration Project,
located on U.S. Highway 101 in Del Norte County,
from post mile 12.0 to 15.5, south of Crescent City, CA

INITIAL STUDY

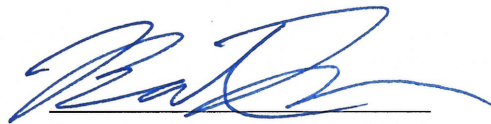
with Proposed Negative Declaration and Proposed Section 4(f) *de minimis* Determination

Submitted Pursuant to: Division 13, California Public Resources Code
and 49 U.S.C. §303 and 23 U.S.C. §138

THE STATE OF CALIFORNIA
Department of Transportation

12/17/19

Date of Approval



Brandon Larsen, Office Chief
North Region Environmental-District 1
California Department of Transportation
CEQA Lead Agency

The following person(s) may be contacted for more information about this document:

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or use the California Relay Service TTY number, 711 or 1-800-735-2929.



Proposed Negative Declaration

Pursuant to: Division 13, California Public Resources Code

SCH Number: Pending

Project Description

The California Department of Transportation (Caltrans) proposes to conduct a geotechnical investigation in support of the Last Chance Grade Permanent Restoration Project, located on U.S. Highway 101 between post miles 12.0 and 15.5 in Del Norte County.

Determination

This proposed Negative Declaration (ND) is intended to give notice to interested agencies and the public that it is Caltrans' intent to adopt an ND for the project. This does not mean that Caltrans' decision regarding the project is final. This ND is subject to change based on comments received by interested agencies and the public.

Caltrans has prepared an Initial Study for the project and, pending public review, expects to determine from this study that the proposed project would not have a significant impact on the environment for the following reasons:

- The project would have "No Impact" with regard to Agricultural and Forest Resources, Air Quality, Energy, Geology and Soils, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation/Traffic, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.
- The project would have a "Less Than Significant Impact" with regard to Aesthetics, Biological Resources, Cultural Resources, Greenhouse Gas Emissions, and Hydrology and Water Quality.

Brandon Larsen, Office Chief
North Region Environmental-District 1
California Department of Transportation

Date



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List of Abbreviated Terms

Abbreviation	Description
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effect
ARB	Air Resources Board
ARPA	Archaeological Resources Protection Act
BMPs	Best Management Practices
BSA	Biological Study Area
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation (aka the Department)
CCC	California Coastal Commission
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEHC	California Essential Habitat Connectivity
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CH ₄	Methane
CIA	Cumulative Impact Analysis
CNDDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CSP	California State Parks
CTC	California Transportation Commission
CTP	California Transportation Plan
CWA	Clean Water Act
dB	decibel
Department	Department of Transportation (Caltrans)
dbh	diameter at breast height

Abbreviation	Description
DNCRSP	Del Norte Coast Redwoods State Park
DPS	Distinct Population Segment
DSA	Disturbed Soil Area
EBRA	Expert Based Risk Assessment
ECA	Essential Connectivity Area
EFS	Engineered Feasibility Study
EIR	Environmental Impact Report
EO	Executive Order
EPA	Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
ESL	Environmental Study Limit
F	Fahrenheit
FE	Federally Endangered
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FPT	Federally Proposed Threatened
FT	Federally Threatened
FYLF	Foothill Yellow-legged Frog
G	Globally
GDRC	Green Diamond Resource Company
GHG	Greenhouse Gas
GWP	global warming potential
H&SC	Health and Safety Code
H ₂ S	Hydrogen Sulfide
HFCs	Hydrofluorocarbons
HPSR	Historic Property Survey Report
IPCC	Intergovernmental Panel on Climate Change
IS	Initial Study
ITS	Intelligent Transportation System
LCFS	low carbon fuel standard
LCG	Last Chance Grade
LEDPA	least environmentally damaging practicable alternative
LOP	Limited Operating Period
LSAA	Lake or Streambed Alteration Agreement
MAMU	Marbled Murrelet
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MMTCO _{2e}	Million Metric Tons of Carbon Dioxide Equivalent
MND	Mitigated Negative Declaration
MPO	Metropolitan Planning Organization

Abbreviation	Description
MS4s	Municipal Separate Storm Sewer Systems
N ₂ O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Repatriation Act of 1990
NAHC	Native American Heritage Commission
ND	Negative Declaration
NEPA	National Environmental Policy Act
NES	Natural Environment Study
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NNI	net new impervious surface
NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
Non-RPW	Non-Relatively Permanent Waters
NPDES	National Pollutant Discharge Elimination System
NPS	National Parks Service
NRHP	National Register of Historic Places
NRLF	Northern Red-legged Frog
NSO	Northern Spotted Owl
O ₃	ozone
OHV	off-highway vehicles
OHWM	Ordinary High Water Mark
PCE	primary constituent elements
PDT	Project Development Team
PM	post mile
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
PRC	Public Resources Code
PSR	Project Study Report
RNP	Redwood National Park
RPW	Relatively Permanent Waters
RSP	rock slope protection
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
S	State
SCE	State Candidate Endangered
SCS	Sustainable Communities Strategy
SCT	State Candidate Threatened
SE	State Endangered
SF ₆	sulfur hexafluoride
SFP	State Fully Protected

Abbreviation	Description
SHPO	State Historic Preservation Officer
SHS	State Highway System
SL	seismic line
SLR	Sea Level Rise
SNC	Sensitive Natural Community
SPSR	Supplemental Project Study Report
SPT	Standard Penetration Test
SSC	State Species of Special Concern
ST	State Threatened
SWMP	Storm Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TMDLs	Total Maximum Daily Loads
TMP	Traffic Management Plan
UNESCO	United Nations Educational, Scientific and Cultural Organization
U.S. or US	United States
U.S. 101	United States Highway 101
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USEPA or U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
VA	Value Analysis
VegCamp	Vegetation Classification and Mapping Program
VIA	Visual Impact Assessment
VMT	Vehicle Miles Traveled
WDRs	Waste Discharge Requirements

Chapter 1. Proposed Project

1.1. Project History

United States Highway 101 (U.S. 101) between post miles (PM) 12.0 and 15.5 in Del Norte County (known as “Last Chance Grade”) has been progressively sliding towards the Pacific Ocean due to storm events since the roadway was first constructed. The roadway is now at the edge of bluffs that are subject to active coastal erosion.

A major storm event in March 2012 resulted in increased landslide activity, severe highway damage, and the need for emergency repairs. As part of the repairs, Caltrans installed a surface monitoring network and multiple slope indicators. The collected data reveals the landslide complex is as deep as 260 feet, with multiple shallower landslides located throughout the project limits.

Over \$35 million was approved by the Federal Emergency Relief program to repair storm damage from years 2016 and 2017. Repairs included several new retaining walls, repairs to damaged walls, in addition to raising the grade 16 feet at one location. Due to continual road movement, ongoing construction and maintenance activities are necessary to keep U.S. 101 open to the traveling public.

Since the March 2012 storm event, there has been an increase in appeals from the public and elected officials for Caltrans to address the instability and progressive loss of the roadway. In response, Caltrans initiated an Engineered Feasibility Study (EFS). The EFS, completed in June 2015, provided seven alternatives ranging in cost from \$300 million to \$1.2 billion dollars (Year-of-Construction dollars). Caltrans also prepared an Economic Impact Study which concluded that long and short-term highway closures would have a substantial impact on the regional economy. A Project Study Report (PSR) was completed in July 2016 and a Supplemental Project Study Report (SPSR) was completed in July 2019.

In May 2017, the California Transportation Commission (CTC) approved initial funding of \$5 million for preliminary geotechnical studies. An additional \$45 million was allocated in March 2019 which fully funds the environmental compliance phase of the project. Design, right of way, and construction funds will be requested near the completion of the environmental compliance phase.

An Expert Based Risk Assessment (EBRA) was conducted in 2018. The assessment used geological and landslide studies, published reports, and experts with experience with the area to analyze the potential risks associated with long-term ownership of each project alternative including maintenance needs and costs, significant repairs and delays, and long-term closures. The general conclusion was that all alternatives are expected to have high maintenance costs, though the risks of traveler delay and closure vary. However, alternatives located outside of Redwood National and State Parks (known as the “C” alternatives which traverse the Mill Creek watershed) were determined to have the highest associated risk of long-term closure. The information presented in the ERBA was used in a 2018 Value Analysis (VA) which was conducted to determine the viability of the different alignments. Because of the ERBA and the VA, the “C” alignments were eliminated from further consideration.

The alignments for Alternatives “L” and “X” were added as part of the EBRA, and the alignments for Alternatives “G1” and “G2” were added after the VA was completed. The alignments for Alternatives A1, A2, and F are the same as proposed in the 2016 PSR. Please see the Phase 2B Layouts for the currently proposed alignments (Appendix A).

To determine the feasibility of the proposed alternatives and to develop a better understanding of the geology of the area, several geotechnical investigations have occurred, including Phase 1A (completed summer 2018), and Phase 1B and Phase 2A (completed fall 2019). This Initial Study focuses entirely on the effort to perform Phase 2B geotechnical investigations.

For the purposes of the project, the California Department of Transportation (Caltrans) is the lead agency under the California Environmental Quality Act (CEQA).

1.2. Project Description

Caltrans proposes to conduct geotechnical investigation activities (referred to as Phase 2B) east of U.S. 101 between post miles 12.0 and 15.5 in Del Norte County (see Figures 1 and 2). The Phase 2B activities would support the Last Chance Grade (LCG) Permanent Restoration Project, which proposes to develop a permanent solution to the instability and potential roadway failure at LCG.

The proposed Phase 2B geotechnical investigation would include 15 boring locations (with two alternative sites, B-30B and B-34B, under consideration) and 14 seismic refraction line locations (Seismic Lines [SL]). The locations are within Redwood National Park (RNP), Del Norte Coast Redwoods State Park (DNCRSP), and on Green Diamond Resource Company (GDRC) land. The boring and seismic line locations are identified below and on the Phase 2B Layouts (Appendix A). Except for boring location B-36, which would be a horizontal bore, all the borings would be vertical.

- 1) RNP:** B-19, B-20, B-22, B-23, B-24, B-25, B-26, SL 9, SL 10, SL 11, and SL 23. SL 23 straddles the RNP/GDRC property line. SL 11 straddles the RNP and DNCRSP property line.
- 2) DNCRSP:** B-28, B-29, B-30 (A or B), B-34 (A or B), SL 11, SL 12, SL 13, SL 14, SL 15, SL 16, SL 17, SL 18 and SL 21. Location B-36 begins above ground within Green Diamond land but would traverse horizontally below ground into the DNCRSP parcel. SL 18 and SL 21 straddle the DNCRSP/Green Diamond property line. SL 11 straddles the RNP and DNCRSP property line.
- 3) GDRC:** B-16, B-35, B-36, B-40, SL 18, SL 20, SL 21, SL 22, and SL 23. SL 18 and SL 21 straddle the DNCRSP/GDRC property line. SL 23 straddles the RNP/GDRC property line

Choosing the boring and seismic line locations and access routes was an iterative process that involved multiple field reviews and project development team meetings, the identification of geotechnical data needs, and an analysis of the potential effects the investigation could have on environmental resources. The goal was to minimize effects while ensuring the collection of adequate data to be able to determine the viability of potential alternatives. To achieve this goal, each boring and seismic line location was evaluated and, if possible, moved to an alternative location with fewer potential impacts.

The site selection process involved the consideration of access routes and whether existing access roads or trails could be used. Though several borings are required where no existing access is available, in lieu of constructing access roads, the borings were situated where helicopters could safely access (e.g., natural open canopies in the forest). For seismic line locations where no current access roads or trails exist, the locations would be accessed by foot paths.

Project Objective (Purpose and Need)

The purpose of the investigation is to characterize the geology within the project area and along potential roadway alignments. The characterization would occur through the analysis of soil and rock samples, groundwater data, and measurements of slope movement. The information is needed to evaluate and identify geotechnically critical sites, including locations of potential bridge abutments and tunnel portals, and to assess the long-term geotechnical risks along potential alignments.

Proposed Project

The Phase 2B geotechnical investigation would include 15 boring locations (with two alternative sites, B-30B and B-34B, under consideration) and 14 seismic refraction line survey locations. Seven boring and 4 seismic refraction line locations would be within RNP, 4 boring (with two alternative sites) and 9 seismic refraction line locations would be within DNCRSP, and 4 boring and 5 seismic refraction line locations would be within GDRC land (See Appendix A, Phase 2B Layouts).

Redwood National Park: Boring Locations and Seismic Line Access

Boring locations B-23 and B-24 would be accessed and drilled on existing roads east of U.S. 101. No vegetation removal or grading is proposed at these sites.

Sites B-19, B-20, B-25, and B-26 would be accessed from an existing National Park Service (NPS) road and the DeMartin section of the Coastal Trail and may need up to 50- by 50-feet of vegetation trimming and clearing. A large existing clearing adjacent to the access road would be used for staging. Brushing, tree removal, and light grading on sections of the access road and trail are anticipated (see attached Phase 2B Layouts).



Figure 1. Project location

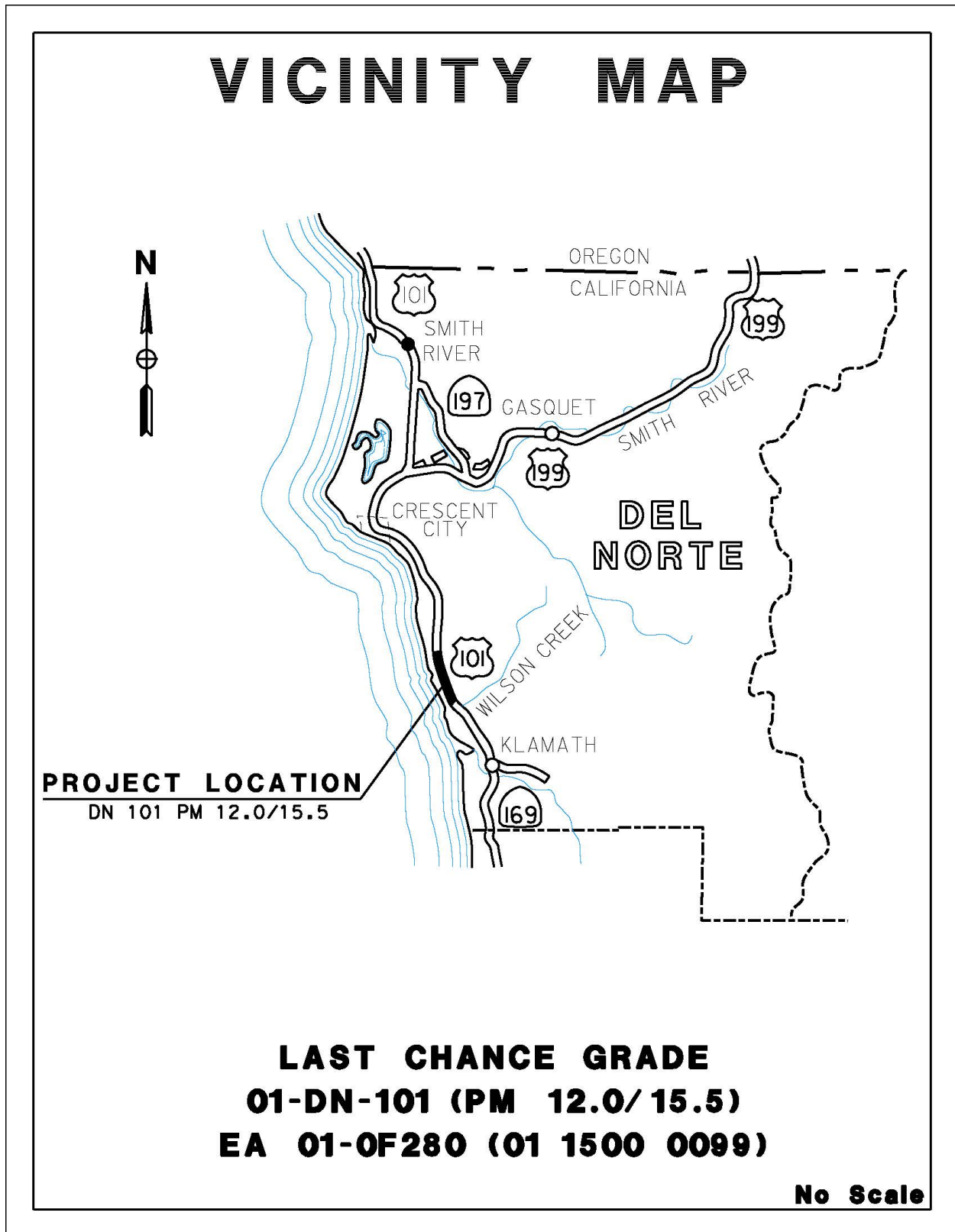


Figure 2. Project Vicinity

A rubber track rig (less than 6 feet wide) would be used to minimize disturbance within the park. It is anticipated this section of the Coastal Trail and the DeMartin Campground would need to be closed for approximately 6-8 weeks to complete the initial access work, drilling, and site restoration.

Site B-22 is located upslope from U.S. 101. To create access, heavy grading and filling of an existing erosional scar (up to 15 feet deep) is proposed. Post operation, a rock dissipation structure would be constructed to prevent future erosion.

All borings within the park would be vertical borings.

Seismic lines SL 9, SL 10, SL 11, and SL 23 would be accessed by foot; light vegetation trimming may be required to create a pathway to the locations. SL 23 straddles the RNP/GDRC property line. SL 11 straddles the RNP and DNCRSP property line.

Del Norte Coast Redwoods State Park: Boring Locations and Seismic Line Access

Due to thick vegetation, topography, and other access limitations, equipment would be delivered to boring locations B-28, B-29, B-30A, and B-34A by helicopter. These locations were chosen based on the amount of naturally open canopy. Locations B-30B and B-34B are alternative sites for locations B-30A and B-34A, and, if needed, would also be accessed by helicopter. The alternative sites are near the proposed B-30A and B-34A drilling sites and would only be used if they were determined to be safer and easier to access. This determination would be made by the helicopter pilot once geotechnical staging activities begin. Once the equipment is delivered, the drilling team would access the locations by foot from U.S. 101. For equipment access purposes, trimming of vegetation (with hand tools) to 6 inches above the ground would be required.

All borings originating within the park would be vertical borings. Boring location B-36 begins above ground within GDRC land but would traverse horizontally below ground into the DNCRSP parcel.

Seismic lines SL 11, SL 12, SL 13, SL 14, SL 15, SL 16, SL 17, SL 18 and SL 21 would be accessed by foot, and light vegetation trimming (with hand tools) may be required to create a pathway to both the boring and survey line locations. SL 18 and SL 21 straddle the DNCRSP/GDRC property line. SL 11 straddles the RNP and DNCRSP property line.

No road access, road development, or road creation would occur within California State Parks (CSP) land (see attached Phase 2B Layouts).

Green Diamond Land: Boring Locations and Seismic Line Access

Boring locations B-16, B-36, and B-40 would be accessed by existing GDRC logging roads and may need up to 50- by 50-feet of vegetation trimming and clearing. Brushing, small tree removal and light grading on two sections of an existing GDRC road would be needed (see attached Phase 2B Layouts). Location B-35 would be accessed by helicopter. Boring B-36 is a horizontal bore that originates in GDRC land and once below ground extends into DNCRSP land.

Seismic lines SL 18, SL 20, SL 21, and SL 22 would be accessed by foot from existing GDRC roads. Seismic line location SL 23 would be accessed from the DeMartin Campground. SL 18 and SL 21 straddle the DNCRSP/GDRC property line. SL 23 straddles the RNP/GDRC property line.

Helicopter Access

Due to thick vegetation, topography, and other access limitations, equipment would be delivered to five bore locations by helicopter, as described above. All helicopter drilling sites are in areas with an existing natural gap in the canopy. There are three potential helicopter staging areas located along GDRC logging roads that have larger clearings (Appendix A).

An AS350 Airbus Helicopter, with a 1,400-pound load capacity and low noise and downdraft, would likely be used to transfer equipment to drilling sites. Equipment would be lowered from the helicopter using a 100- to 200-foot cable. A pre-fabricated, modular steel drill platform, approximately 20- by 20-feet would be placed at each site for the duration of the drilling. The drilling platform requires an area of up to 50- by 50-feet cleared of vegetation to 6 inches above the ground, and is supported by up to eight legs, each requiring approximately 2- by 2-feet of ground clearing to ensure flat contact with the ground.

It would take approximately 12 trips to get the drill deck and other equipment into place at each location. The longest flight path is 1.2 miles, between the easternmost helicopter staging area and the southernmost boring location (B-28). Based on the anticipated flight speed, each one-way flight would take approximately 7 to 8 minutes (~90 minutes/12 trips). Assuming a few miles round trip and no complications, this would take approximately 90 minutes for each location. Additional flights to resupply drill sites would also be required.

Approximately 20% of the one-way flight path would be over DNCRSP land and 80% would be over logged secondary forest on GDRC land. There would be no flights over NPS land. As drilling at each location is anticipated to take one week, flights associated with the

mobilization and demobilization of each site would be about one week apart. Depending on equipment and staff availability, two drill crews may work simultaneously; however, both crews would be serviced by the same helicopter.

Due to weather conditions and anticipated environmental work windows, helicopter operations would occur between September 2020 and January 2021, ideally in September and October, as weather conditions allow. As needed, when helicopters are working near or are required to cross over U.S. 101, temporary road closures with traffic control may be implemented.

Drilling Equipment

The following equipment would be required for the investigation: a platform, track- or truck-mounted drill rig equipped with a Standard Penetration Test (SPT) hammer, water truck, crew cab, and a geologist/engineer's vehicle. Portable ground protection mats may be used to aid vehicular access and protect soft ground surfaces. As a best management practice (BMP), plastic sheeting and straw wattle would be used to contain any drilling fluid.

The SPT is an in situ dynamic penetration test designed to provide geotechnical engineering properties of the soil. The SPT hammer uses a thick-walled, spilt-spoon sample tube approximately 25.6 inches long with an outside diameter of 2 inches and inside diameter of 1.4 inches. This tube would be driven into the ground by a 140-pound slide hammer freefalling 30 inches. The tube would be driven 18 inches into the ground, or until hammer refusal.

Drilling Procedure

To obtain quality soil and rock samples at the depths needed, a mud rotary drilling system would be required for the borings. Borings would be 4.75 inches in diameter and would extend approximately 200 feet below ground surface. The system requires drilling fluid to keep the borehole open, bring cuttings to the surface, and to lubricate and cool the drill bit. Drilling fluid is made up of water 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, 3.7 inches (94-millimeter) drill rod, and mud tank. The mud tank would be positioned on the ground surface adjacent to the drill rig and would serve as a settling tank for soil cuttings. The cuttings would be removed periodically and placed in 55-gallon steel drums, which would be transferred to a fenced staging area.

Standpipe monitoring wells or slope indicators may be installed in the bore holes; these would be monitored periodically for up to 2 years before being destroyed in accordance with Del Norte County Environmental Health Division's requirements. Holes receiving a monitoring well would be flushed with clean water before a slotted PVC standpipe is installed and the annular space filled with clean #8 sand. The hole would be sealed with bentonite plugs to prevent infiltration of surface water or migration of water between aquifers. During drilling, the drill crew and geologist/engineer onsite would monitor for any leaks or spills of drilling fluid. If drilling fluid were to leak, the drill crew would immediately contain the escaping fluid and clean the impacted area.

Seismic Surveys

Seismic refraction line surveys are conducted to help characterize the subsurface conditions, estimate the depth to rock, and evaluate rip-ability of proposed excavations. The surveys would be performed on foot. Vegetation removal would consist of limited trimming of ground-level undergrowth in a strip up to 4 feet wide (enough to lay out the equipment).

The survey lines would be between 200 and 600 feet long. Surveys would take approximately two days to complete. The surveys involve placing 24 small geophones (seismic sensors) on the ground in a straight line at equal spacing. The geophones have a 1-inch long prong that is pressed into the ground (usually by foot) to hold the geophone firmly so that shock waves are transmitted efficiently from the ground to the potentiometers inside the geophone. The geophones transmit a signal to a seismograph unit by a specialized cable. Shock waves would be created by slamming a 12- to 16-pound human-powered sledgehammer against a striker plate placed on at least seven different locations along the refraction line. The striker plate consists of an 8-inch square and a 0.75-inch thick steel plate or high-density polyethylene. The noise from the hammer striking the metal plate is estimated at 108 decibels (dB) at 9.8 feet and is approximately 85 dB at 50 feet.

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 provide insufficient energy to cover the entire survey line, a shock-producing device involving a down-hole shotgun would be used. The down-hole shotgun uses an industrial shell fired in a minimum 1.5-foot deep water-filled hole created by a hand auger. The industrial shell is an 8-gauge 350- to 500-grain blank shotgun cartridge. Shells are triggered approximately 20 minutes apart. Shotgun detonations may leave an area of disturbed earth up to 2 feet in diameter. Disturbed soil would be tamped down to return it to its original condition. Detonation of the

shells occurs below ground and usually does not pose a fire hazard, but fire suppression equipment would be 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.

Anticipated Schedule

Phase 2B drilling and seismic survey activities are anticipated to occur between September 16, 2020, and January 31, 2021. Because it poses minimal potential disruption to highway traffic, work would be conducted during the day. If needed, drilling time restrictions would be observed at certain locations to minimize potential disturbance to nearby resources.

Post Investigation Clean-Up Operations

After the completion of each 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 be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean surfaces to prevent contamination of future storm-water or impacts to public safety, a minimal amount would be used and as much of the dirty water captured as practical. Any areas of ground disturbance created during off-road drilling activities would be treated with appropriate BMPs to prevent erosion and stormwater pollution. Borings that do not receive a monitoring pipe would be backfilled using neat cement grout placed at the base of the bore hole by tremie in accordance with Caltrans requirements. Any holes in the road surface would be patched with fast setting cement.

No-Build Alternative

The No-Build Alternative would involve conducting no geotechnical investigation activities.

Alternatives Considered but Eliminated from Further Consideration

The proposed geotechnical investigation would provide data to help identify potentially reasonable and feasible alternatives for the greater highway project. As part of this effort, only one overall geotechnical investigation alternative has been proposed, thus no investigative alternatives have been eliminated. However, as discussed earlier in this section, bore and seismic line locations were evaluated and, where possible, moved to locations that would have fewer potential impacts. Site selection was an iterative process that included

multiple factors including geotechnical data needs, access routes, and environmental resources.

General Plan Description, Zoning, and Surrounding Land Uses

The project area and surrounding lands are within Del Norte County and subject to the Del Norte County General Plan of 2003. The project spans several land use areas, including the state and federal lands of DNCRSP and RNP, and the timberlands owned by GDRC. While GDRC is zoned as a Timber Preserve Zone, the state and national park either have no zoning designation or are designated as RNP. The project would not change the existing land use or zoning designations in the project area.

1.3. Permits and Approvals Needed

As proposed, the project would not impact any wetlands or jurisdictional waters. The following permits, consultations, and approvals would be required.

Table 1. Agency Approvals

Agency	Permit/Approval	Status
U.S. Fish and Wildlife Service (USFWS)	Federal Endangered Species Act Section 7 Consultation	Consultation will be initiated after the circulation of the Initial Study
National Park Service (NPS)	Department of Transportation Act Section 4(f)	Draft Section 4(f) analysis provided to NPS; final approval will be requested after circulation of the Initial Study
California State Parks (CSP)	Department of Transportation Act Section 4(f)	Draft Section 4(f) analysis provided to NPS; final approval will be requested after circulation of the Initial Study
Del Norte County Planning	Coastal Development Permit	Obtained after the Final Environmental Document (FED) is approved.

Department of Transportation Act Section 4(f)

For projects that are federally funded, Section 4(f) of the U.S. Department of Transportation (USDOT) Act of 1966 prohibits the Federal Transit Administration and other USDOT agencies from using land from publicly owned parks, recreation areas (including recreational trails), wildlife and water fowl refuges, or public and private historic properties, unless there is no feasible and prudent alternative to that use and the action includes all possible planning to minimize harm to the property resulting from such a use. The project has federal funds and would require the temporary use of a Section 4(f) resource. See Appendix D for more information.

1.4. Standard Measures and Best Management Practices

The following project features are standard measures and Best Management Practices that are part of the project description.

Aesthetics

VA-1: Existing roads and trails, modified as part of the proposed project, would be restored to a pre-disturbance condition and revegetated with appropriate native plants. Final ground sculpting and surfacing, as well planting species and locations, would be developed by the project landscape architect and project biologist based on existing aesthetics, land use, and habitat with the consultation and approval of CSP and the NPS.

VA-2: Trees to be removed would be cut off at the base.

Cultural Resources

CR-1: Any environmentally sensitive areas in proximity to the proposed project would be identified and delineated prior to the start of work. Prior to the start of work, onsite meetings will be conducted to familiarize workers with the location and nature of resources to be protected.

CR-2: Work at specific culturally-sensitive areas would require archeological monitoring.

CR-3: If cultural materials are discovered during geotechnical activities, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find in consultation with tribal representatives, CSP, NPS, and the SHPO.

CR-4: If human remains and related items were discovered on private or State land, they would be treated in accordance with State Health and Safety Code § 7050.5. Further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to CA Public Resources Code (PRC) § 5097.98, if the remains were thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC) who would then notify the Most Likely Descendent (MLD).

Human remains and related items discovered on federally-owned lands would be treated in accordance with the Native American Graves Repatriation Act of 1990 (NAGPRA) (23 USC 3001). The procedures for dealing with the discovery of human remains, funerary objects, or sacred objects on federal land are described in the regulations that implement NAGPRA 43 CFR Part 10. All work in the vicinity of the discovery would be halted and the RNP Archaeologist would be notified immediately. The Undertaking's implementation in the vicinity of the discovery may not resume until RNP complies with the 43 CFR Part 10 regulations and provides notification to proceed. The responsible Federal agency official (43 CFR 10.2(2)) will be RNP.

Biological Resources

BR-1: To protect migratory and nongame birds, their occupied nests and eggs, nesting-prevention measures would be implemented. Vegetation removal would be restricted to the period outside of the bird breeding season (removal would occur between September 16 and January 31).

BR-2: A qualified biologist would survey appropriate trees that are scoped for removal for the presence of inactive raptor nests. If raptor nests are identified, the tree(s) would be avoided or CDFW would be contacted to coordinate appropriate actions.

BR-3: For Sensitive Natural Communities and Special-Status Plants:

- Limbing, tree removal, and vegetation clearing would be limited to the extent necessary to achieve access and conduct geotechnical activities;
- Where feasible, drilling equipment and vehicles would be parked on non-vegetated surfaces;
- Salvage and replant the mature (i.e., approximately three-foot diameter) sword ferns anticipated to be removed within the proposed grading areas on NPS land;

- If practicable, salvage and replant any mature sword ferns and other native plants that might be removed by brushing or grading along the access road to B-40 and replant leftover salvaged material in areas of RNP where soil is exposed from grading and filling;
- If practicable, salvage and replant any mature sword ferns and other native plants that might be removed by grading and filling of the erosional scar proposed as an access road to B-22 on NPS land;
- If soils become compacted in previously undisturbed areas, measures would be taken to uncompact soils to encourage the regeneration of vegetation;
- All disturbed areas, including boring locations, seismic survey lines and foot paths would be documented. Coordination would occur with State and National Parks to ensure that Park lands are fully restored to a condition at least as good as prior to the project, and in accordance with Park requirements and restoration guidelines. Materials that blend in with the surrounding environment would be used for restoration measures of disturbed soil areas. This may include duff, wood mulch, etc.;
- Invasive weed control in all areas of soil disturbance caused by the geotechnical investigation to improve habitat for native species in and adjacent to disturbed soil areas.
- Conduct annual qualitative monitoring for up to three years after disturbance to assess native plant recovery and the presence of invasive plant species at sites where vegetation clearing and removal or ground disturbance would likely be greatest. These locations include:
 - DNCRSP: The 50- by 50-foot brushing areas, 2- by 2-foot platform leg areas at the helicopter borehole sites, seismic line locations, and foot paths.
 - RNP: (1) all areas proposed for grading along the NPS access road, DeMartin Campground, and Coastal Trail, (2) the erosional scar proposed for grading and filling, and (3) along seismic lines, foot paths, and any other areas where revegetation or replanting occurs.
- Areas that are graded would be restored to a pre-disturbance condition.
- All restoration work would be inspected and approved by CSP and NPS.

- Prior to the start of work, temporary high visibility fencing and/or flagging would be installed around sensitive natural communities and, if identified within the ESL, special-status plants, where appropriate.

BR-4: Prior to the start of work, temporary high visibility fencing and/or flagging would be installed around intermittent streams, wetlands and other waters, where appropriate. No work would occur within fenced/flagged areas and no discharge of construction debris would take place.

BR-5: For special-status amphibians, a qualified biologist would conduct an amphibian survey immediately prior to ground-disturbing work, such as grading or vegetation removal. If amphibians are discovered in areas of work activities, they would be relocated to nearby suitable habitat. If threatened or endangered species are discovered, including Foothill Yellow-legged frog (FYLF), work would either be stopped until the animal is out of the impact area, or CDFW would be contacted to establish steps to avoid or minimize adverse effects.

BR-6: A Limited Operating Period (LOP) would be observed, whereby all project activities would occur during daytime hours and between September 16 and January 31, which is a time of year when the following listed species would not be expected to have dependent young: ring-tailed cat, Sonoma tree vole, white-footed vole, Townsend's big-eared bat, Humboldt marten, fisher West Coast Distinct Population segment (DPS), NSO, and MAMU. Specific measures for threatened and endangered species include:

- Ring-tailed cat: Prior to removal, the mature alder tree at B-34A or B-34B, or any other suitable denning habitat, would be surveyed by a qualified biologist for cavities that could provide rest or den sites. If a potential den is identified, it would be monitored until absence was confirmed or CDFW would be contacted to establish appropriate steps.
- Humboldt marten and fisher: Prior to removal, the mature alder tree at B-34A or B-34B, or any other suitable denning habitat, would be surveyed by a qualified biologist for cavities that could provide rest or den sites. If a potential den is identified, it would be monitored until absence was confirmed or USFWS and CDFW would be contacted to establish appropriate steps. Except where delivering equipment and landing (in designated staging areas), helicopters would operate at an altitude high enough to avoid damaging trees directly or by rotor wash.

- Northern spotted owl and marbled murrelet: Except where delivering equipment and landing (in designated staging areas), helicopters would operate at an altitude high enough to avoid damaging trees directly or by rotor wash. No suitable NSO or MAMU nest trees would be removed.

BR-11: Before start of work, a meeting with the contractor would consist of a briefing 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-12: A rubber track rig (less than 6 feet wide) would be used to minimize disturbance within the park. At the direction of NPS, gravel and/or rubber mats would be used to ensure the track rig does not negatively impact the road, coastal trail, or bore locations.

BR-13: Prior to installation, NPS would review and comment on the proposed rock dissipation structure located at B-22.

BR-14: Drilling contractors would be directed to take precautions against fire, such as keeping fire suppression equipment on hand.

Geology and Soils

GS-1: In the unlikely event that paleontological resources were encountered during grading, Caltrans Standard Specification 14-7 would be followed. This standard specification states that if unanticipated paleontological resources were discovered at the job site, all work within 60 feet would stop, the area around the fossil would be protected, and the Caltrans geotechnical investigation lead would be notified.

Invasive Species

IS-1: To improve habitat for native species in and adjacent to disturbed soil areas within the project limits, Caltrans would implement a program of invasive weed control in all areas of soil disturbance caused by geotechnical investigation activities.

IS-2: Any hay, straw, hay bales, straw bales, seed, mulch, or other material used for erosion control or landscaping in the project area would be free of noxious weed seeds and propagules.

IS-3: All driven equipment would be thoroughly cleaned of all dirt and vegetation prior to entering the Environmental Study Limits (ESL) in order to prevent importing noxious weeds.

IS-4: All equipment, materials and fill brought to the site, including drill rigs, rock, gravel, road base, sand, and topsoil, would be free of noxious weed seeds and propagules.

IS-5: Caltrans would not allow disposal of soil and plant materials from any areas that support invasive species to areas that support stands dominated by native vegetation.

IS-6: Any seed mixes or other vegetative material used for revegetation of disturbed sites would consist of nonpersistent cereal grain, California native seed mix, or locally adapted native plant materials to the extent practicable.

IS-7: Plant species used for erosion control would consist of native, noninvasive species or nonpersistent hybrids that would prevent invasive species from colonizing.

IS-8: Workers would be educated on the importance of controlling and preventing the spread of identified invasive nonnative species.

Public Resources

PR-1: Signage would be posted at trailheads and at the DeMartin campground, and information would be posted on websites at the beginning of the year, to notify hikers and campers of the construction activities (including helicopter use).

Traffic and Transportation

TT-1: Pedestrian and bicycle access would be maintained along U.S. 101 during geotechnical activities.

TT-2: The contractor would be required to reduce any access delays to driveways or public roadways within or near the work zones.

Utilities and Emergency Services

UE-1: All emergency response agencies in the project area would be notified of the project schedule and would have access to U.S. 101 throughout the investigation period.

Water Quality and Stormwater Runoff

WQ-1: Existing vegetation would be removed to the minimum extent necessary to facilitate the proposed work.

WQ-2: Temporary access road entrances and exits would be stabilized and maintained to prevent sediment erosion and transport from the work area.

WQ-3: Temporary drainage inlet protection methods, such as gravel bags, would be deployed to prevent sediment and other pollutants from entering drainage systems.

WQ-4: Where needed, perimeter control devices, such as fiber rolls, compost socks, and silt fences, would be used to prevent sediment transport from the project site.

WQ-5: Drilling equipment, re-fueling areas, as well as equipment and storage areas would be covered and located away from drainage inlets and waterways to prevent both stormwater and non-stormwater discharges.

WQ-6: Prevent drilling slurries and fluids from entering storm drain systems and receiving waterbodies.

1.5. Discussion of the NEPA Categorical Exclusion

This document contains information regarding compliance with the CEQA and other state laws and regulations. Separate environmental documentation, supporting a Categorical Exclusion determination, would be prepared in accordance with the National Environmental Policy Act. When needed for clarity, or as required by CEQA, this document may contain references to federal laws and/or regulations (CEQA, for example, requires consideration of adverse effects on species identified as a candidate, sensitive, or special-status species by the National Marine Fisheries Service [NMFS] and the United States Fish and Wildlife Service [USFWS]—in other words, species protected by the Federal Endangered Species Act



Chapter 2. CEQA Environmental Checklist

2.1. Environmental Factors Potentially Affected Environmental Factors Potentially Affected

The environmental factors noted in bold below would be potentially affected by the project. Please see the CEQA checklist on the following pages for additional information.

Potential Impact Area	Impacted: Yes / No
Aesthetics	Yes
Agriculture and Forest Resources	No
Air Quality	No
Biological Resources	Yes
Cultural Resources	Yes
Energy	No
Geology and Soils	No
Greenhouse Gas Emissions	Yes
Hazards and Hazardous Materials	No
Hydrology and Water Quality	Yes
Land Use and Planning	No
Mineral Resources	No
Noise	No
Population and Housing	No
Public Services	No
Recreation	No
Transportation/Traffic	No
Tribal Cultural Resources	No
Utilities and Service Systems	No
Wildfire	No
Mandatory Findings of Significance	No

The CEQA Environmental Checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the project will indicate there are no impacts to a particular resource. A “No Impact” answer in the last column of the checklist reflects this determination.

The words “significant” and “significance” used throughout the checklist and this document are only related to potential impacts pursuant to CEQA. The questions in the CEQA Checklist are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project as well as standard measures that are applied to all or most Caltrans projects (such as Best Management Practices (BMPs) and measures included in the Standard Plans and Specifications or as Standard Special Provisions), are considered to be an integral part of the project and have been considered prior to any significance determinations documented in the checklist or document.

2.2. Project Impact Analysis Under CEQA for Initial Study

CEQA broadly defines “project” to include *“the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment”* (14 CCR § 15378). Under CEQA, the baseline for environmental impact analysis normally consists of the existing conditions at the time the environmental studies began. However, it is important to choose the baseline that most meaningfully informs decision-makers and the public of the project’s possible impacts. Where existing conditions change or fluctuate over time, and where necessary to provide the most accurate picture practically possible of the project’s impacts, a lead agency may define existing conditions by referencing historic conditions, or conditions expected when the project becomes operational, or both, that are supported with substantial evidence. In addition, a lead agency may also use baselines consisting of both existing conditions and projected future conditions that are supported by reliable projections based on substantial evidence in the record. The CEQA Guidelines require a “statement of objectives sought by the proposed project” (14 CCR § 15124(b)).

CEQA requires the identification of each potentially “significant effect on the environment” resulting from the action, and ways to mitigate each significant effect. Significance is defined as *“Substantial or potentially substantial adverse change to any of the physical conditions within the area affected by the project”* (14 CCR § 15382). CEQA determinations are made prior to and separate from the development of mitigation measures for the project.

The legal standard for determining the significance of impacts is whether a “fair argument” can be made that a “substantial adverse change in physical conditions” would occur. The fair argument must be backed by substantial evidence including facts, reasonable assumption predicated upon fact, or expert opinion supported by facts. Generally, an environmental professional with specific training in a particular area of environmental review can make this determination.

Though not required, CEQA suggests Lead Agencies adopt *thresholds of significance*, which define the level of effect above which the Lead Agency will consider impacts to be significant, and below which it will consider impacts to be less than significant. Given the size of California and its varied, diverse, and complex ecosystems, as a Lead Agency that encompasses the entire State, developing *thresholds of significance* on a state-wide basis has not been pursued by Caltrans. Rather, to ensure each resource is evaluated objectively, Caltrans analyzes potential resource impacts based on their location and the effect of the potential impact on the resource as a whole in the project area. For example, if a project has the potential to impact 0.10 acre of wetland in a watershed that has minimal development and contains thousands of acres of wetland, then a “less than significant” determination would be considered appropriate. In comparison, if 0.10 acre of wetland would be impacted that is located within a park in a city that only has 1.00 acre of total wetland, then the 0.10 acre of wetland impact could be considered “significant.”

If the action may have a potentially significant effect on any environmental resource (even with mitigation measures implemented), then an Environmental Impact Report (EIR) must be prepared. Under CEQA, the lead agency may adopt a negative declaration (ND) if there is no substantial evidence that the project may have a potentially significant effect on the environment (14 CCR § 15070(a)). A proposed negative declaration must be circulated for public review, along with a document known as an Initial Study (IS). CEQA allows for a “mitigated negative declaration (MND)” in which mitigation measures are proposed to reduce potentially significant effects to less than significant (14 CCR § 15369.5).

Although the formulation of mitigation measures shall not be deferred until some future time, the specific details of a mitigation measure may be developed after project approval when it is impractical or infeasible to include those details during the project’s environmental review. The lead agency must (1) commit itself to the mitigation, (2) adopt specific performance standards the mitigation will achieve, and (3) identify the type(s) of potential action(s) that can feasibly achieve that performance standard and that will be considered, analyzed, and potentially incorporated in the mitigation measure. Compliance with a regulatory permit or other similar process may be identified as mitigation if compliance would result in implementation of

measures that would be reasonably expected, based on substantial evidence in the record, to reduce the significant impact to the specified performance standards (14 CCR §15126.4(a)(1)(B)). Per CEQA, measures may also be adopted, but are not required, for environmental impacts that are not found to be significant (14 CCR § 15126.4(a)(3)). Under CEQA, mitigation is defined as avoiding, minimizing, rectifying, reducing, and compensating for any potentially significant impact (CEQA § 15370).

Regulatory agencies may require additional measures beyond those required for compliance with CEQA. Though not considered “mitigation” under CEQA, these measures are often referred to in an Initial Study as “mitigation”, Good Stewardship or Best Management Practices. These measures can also be identified after the Initial Study/Negative Declaration is approved.

CEQA documents must consider direct and indirect impacts of a project (CAL. PUB. RES. CODE § 21065.3). They are to focus on significant impacts (14 CCR § 15126.2(a)). Impacts that are less than significant need only be briefly described (14 CCR § 15128). All potentially significant effects must be addressed.

2.3. Aesthetics

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

Regulatory Setting

The California Environmental Quality Act establishes that it is the policy of the state to take all action necessary to provide the people of the state “with...enjoyment of *aesthetic*, natural, scenic and historic environmental qualities” (CA Public Resources Code [PRC] § 21001[b]).

Environmental Setting

The project area is adjacent to U.S. 101 and within Redwood National Park (RNP) and Del Norte Coast Redwoods State Park (DNCRSP), and on Green Diamond Resource Company (GDRC) land; the portions of work in RNP and DNCRSP are in the Coastal Zone. The area is highly rural and is characterized by mountainous terrain, redwood forest (including old-growth), and the

adjacent Pacific Ocean, which is visible from parts of the project area. Both the Pacific Ocean and old-growth redwood forests are considered scenic resources.

The section of U.S. 101 in the area is officially designated as a State Scenic Highway and is listed as a view corridor for the False Klamath Cove area by the Del Norte County General Plan Coastal Element. In addition, Redwood National and State Parks, which includes RNP and DNCRSP, is listed as a Natural Site in the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage system. The project area also includes portions of the California Coastal Trail, and a backcountry campground known as the DeMartin Campground.

Discussion of Environmental Evaluation Question 2.3.—Aesthetics

A Visual Impact Assessment (VIA) (Caltrans 2019i) was prepared to document potential impacts to visual resources.

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

A “No Impact” determination was made for this question based on the scope, description, and location of the proposed project, as well as the VIA.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

A “No Impact” determination was made for this question based on the scope, description, and location of the proposed project, as well as the VIA.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point.)

The geotechnical investigation includes activities that would be accessed via U.S. 101, by off-highway roads and trails, and by helicopter:

- **U.S. 101 Access:** Bore locations B-22, B-23, and B-24 would be accessed directly from U.S. 101. Views of construction activities are common on the highway within the project area; therefore, it is not anticipated highway viewers would have a high level of sensitivity to seeing construction equipment. Location B-22 would require heavy grading and rock slope protection (RSP). However, due to limited visual exposure of the RSP from the highway and measures listed in Section 1.4., it is not anticipated this work would result in a high viewer response.
- **Existing Roads and Trails:**
 - **GDRC:** Two locations would require minor grading. Because the land is actively managed for timber production (where tree and vegetation removal and grading are typical activities), it is anticipated that viewers on Green Diamond land would have very low sensitivity and exposure to the project activities, and subsequently have a very low viewer response.
 - **RNP:** Minor grading would occur at spot locations along the access road and trail. During work activities at drilling sites B-19, B-20, B-25, and B-26, a portion of the Coastal Trail and the DeMartin Campground would be closed for approximately six to eight weeks. Trail users would not have access or views of the work areas until construction activities are over. It is anticipated that trail users would not be sensitive to specific changes, but rather broad changes that visually stand out when compared with the rest of the trail, such as bare areas or areas with uncharacteristic vegetation clearing or removal. Park staff would likely have a higher level of viewer exposure as they actively use and manage the access roads and trails, and are overall more sensitive to construction work in the Park due to the nature of their work. This leads to a higher level of viewer response to any changes to the visual environment.
 - **DNCRSP:** No existing roads or trails would be used on State Park land.
- **Bore Locations:** Vegetation trimming would occur at each bore location, and standpipe monitoring wells and/or slope indicators would be installed. Bore locations B-16, B-22, B-23, B-24 and B-26, B-28, B-29, B-30(A or B), B-34(A or B), B-35, and B-36 are in locations where Park visitors and Green Diamond employees typically do not access; therefore, no viewer response would be anticipated. Bore locations B-20 and B-25 are on the Coastal Trail and location B-19 is within the DeMartin Campground. The same viewer response is anticipated as what is described above under Existing Roads and Trails.

- **Seismic Refraction Lines:** With the exception of SL 23, which is partly in the DeMartin Campground, none of the seismic lines are in areas where Park visitors or Green Diamond employees would typically access. Minimal vegetation trimming would be required for SL 23. Given this, it is anticipated there would be very low to no viewer response.

Based on the bulleted items below, the VIA concluded the visual impacts would be low. Given this, a “Less Than Significant Impact” determination was made for this question.

- Standpipe monitoring wells and/or slope indicators would have low visibility and would not detract from views of the area.
- Seismic line work would not likely be visible to viewers.
- Grading and vegetation removal activities that result in uncharacteristic bare areas and land forms, or stumps that have visibly been cut adjacent to the Coastal Trail and campground, would result in changes to visual resources. However, site conditions are anticipated to have a high rate of natural recruitment and disturbed areas would be restored.
- Grading and RSP located at the B-22 site would lead to low visual impacts. Impacts are not higher due to the limited visibility of the work from the highway and due to the standard measures identified in Section 1.4.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

A “No Impact” determination was made for this question based on the scope, description, and location of the proposed project, as well as the VIA.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.4. Agriculture and Forest Resources

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection (Cal Fire) regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	N/A	N/A	N/A	Yes
Would the project: b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	N/A	N/A	N/A	Yes
Would the project: c) Conflict with existing zoning, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	N/A	N/A	N/A	Yes
Would the project: d) Result in the loss of forest land or conversion of forest land to non-forest use?	N/A	N/A	N/A	Yes

Would the project: e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	N/A	N/A	N/A	Yes
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“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to Agriculture and Forest Resources are not anticipated due to the lack of agricultural land within or adjacent to the project area and the scope of work would not conflict with the zoning of or result in the loss or conversion of timberland (although there is timberland within the project area).

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.5. Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Conflict with or obstruct implementation of the applicable air quality plan?	Not Applicable (N/A)	N/A	N/A	Yes
Would the project: b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	N/A	N/A	N/A	Yes
Would the project: c) Expose sensitive receptors to substantial pollutant concentrations?	N/A	N/A	N/A	Yes
Would the project: d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project, as well as the project’s analysis on air quality (Caltrans 2019c). Conformity requirements do not apply as Del Norte County is designated as attainment or is unclassified for all current National Air Quality Standards.

There would be temporary construction emissions associated with the project. For more information on greenhouse gas emissions, please see Section 2.10—Greenhouse Gas Emissions.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.6. Biological Resources

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, or NOAA Fisheries?	Not Applicable (N/A)	N/A	Yes	N/A
Would the project: b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	N/A	N/A	Yes	N/A
Would the project: c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	N/A	N/A	N/A	Yes
Would the project: d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	N/A	N/A	N/A	Yes
Would the project: e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	N/A	N/A	N/A	Yes
Would the project: f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	N/A	N/A	N/A	Yes

Regulatory Setting

Natural Communities

The California Department of Fish and Wildlife (CDFW) has jurisdiction over the conservation, protection, and management of wildlife, native plants, and habitat necessary to maintain biologically sustainable populations (CFGF, § 1802). CDFW, as trustee agency under CEQA Guidelines Section 15386, provides expertise in reviewing and commenting on environmental documents and provides protocols regarding potential negative impacts to those resources held in trust for the people of California.

CDFW maintains records of sensitive natural communities (SNC) in the California Natural Diversity Database (CNDDB). SNC are those natural communities that are of limited distribution statewide or within a county or region, and are often vulnerable to environmental effects of projects. These communities may or may not contain special-status taxa or their habitat. High priority SNC 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. Natural communities with ranks of S1-S3 are to be addressed in the environmental review processes of CEQA and its equivalents.

Wetlands and waters of the U.S. are also considered sensitive by both federal and state agencies, which are discussed in more detail below.

Wetlands and Other Waters

FEDERAL

Waters of the U.S. (including wetlands) are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high-water mark (OHWM), in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters

must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

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

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with *U.S. EPA's Section 404(b)(1) Guidelines (40 Code of Federal Regulations [CFR] 230)*, and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

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

STATE

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCBs), and CDFW. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved.

Sections 1600–1607 of the California Fish and Game Code (CFGF) require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement (LSAA) would be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Hydrology and Water Quality section for additional details.

Plant Species

The U.S. Fish and Wildlife Service (USFWS) and CDFW have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special-status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species section in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at United States Code 16 (USC), Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at CFGC, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, found at CFGC, Sections 1900–1913, and CEQA, found at California Public Resources Code, Sections 21000–21177.

Animal Species

Many state and federal laws regulate impacts to wildlife. The USFWS, National Oceanic and Atmospheric Administration’s National Marine Fisheries Service (NOAA Fisheries Service [NMFS]), and CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Acts. Species listed or proposed for listing as threatened or endangered are discussed in the following section. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NMFS candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act (NEPA)
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act (CEQA)
- Sections 1600–1603 of the CFGC
- Sections 4150 and 4152 of the CFG

Threatened and Endangered Species

The primary federal law protecting threatened and endangered species is FESA: 16 United States Code (USC) Section 1531, et seq. See also 50 CFR Part 402. This act, and later amendments, provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration (FHWA) (and Caltrans, as assigned), are required to consult with the USFWS and NMFS to ensure they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a

Biological Opinion with an Incidental Take Statement, a Letter of Concurrence, and/or documentation of a No Effect finding. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level—the California Endangered Species Act (CESA), CFGC Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. CDFW is the agency responsible for implementing CESA. Section 2080 of the CFGC prohibits “Take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the CFGC as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an Incidental Take Permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the CFGC.

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

Invasive Species

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

Environmental Setting

To comply with the provisions of various state and federal environmental statutes and executive orders, potential impacts to natural resources in the project area were investigated and documented. Field reviews were conducted to identify existing habitat types and natural communities, waters and wetlands, rare species and/or factors indicating the potential for rare species (i.e., presence of suitable habitat). Information on survey dates and personnel are listed in Appendix F.

A Natural Environment Study (NES) (Caltrans 2019g), was prepared to summarize the studies conducted for the project, including a Botanical Survey and Habitat Assessment Report (Caltrans 2019b), Aquatic Resources Delineation (Caltrans 2019a), and an Environmentally Sensitive Habitat Assessment (Caltrans 2019d). Caltrans coordinated with fisheries biologists and water quality specialists, as well as agency personnel from DNCRSP, RNP, CDFW, USFWS, NMFS, and USACE. See Chapter 3 for a summary of these coordination efforts and professional contacts.

Environmental Study Limits (ESL) and a Biological Study Area (BSA) (see Figure 3) were established to evaluate the potential presence of SNC, aquatic resources, and special-status plants and animals. The ESL includes all areas of potential impacts and is defined as 100 feet from all project components in the Coastal Zone and 50 feet from all project components outside the Coastal Zone. The 100-foot ESL within the Coastal Zone is to satisfy the California Coastal Zone Conservation Act and Del Norte County local coast permit requirements of 100-foot buffer from all Environmentally Sensitive Habitat Areas (ESHAs). The ESL covers approximately 66 acres.

Portions of the project are located within the Coastal Zone, with these portions being under “Local” jurisdiction (i.e., Del Norte County). No portion of the project is in an area under State jurisdiction.

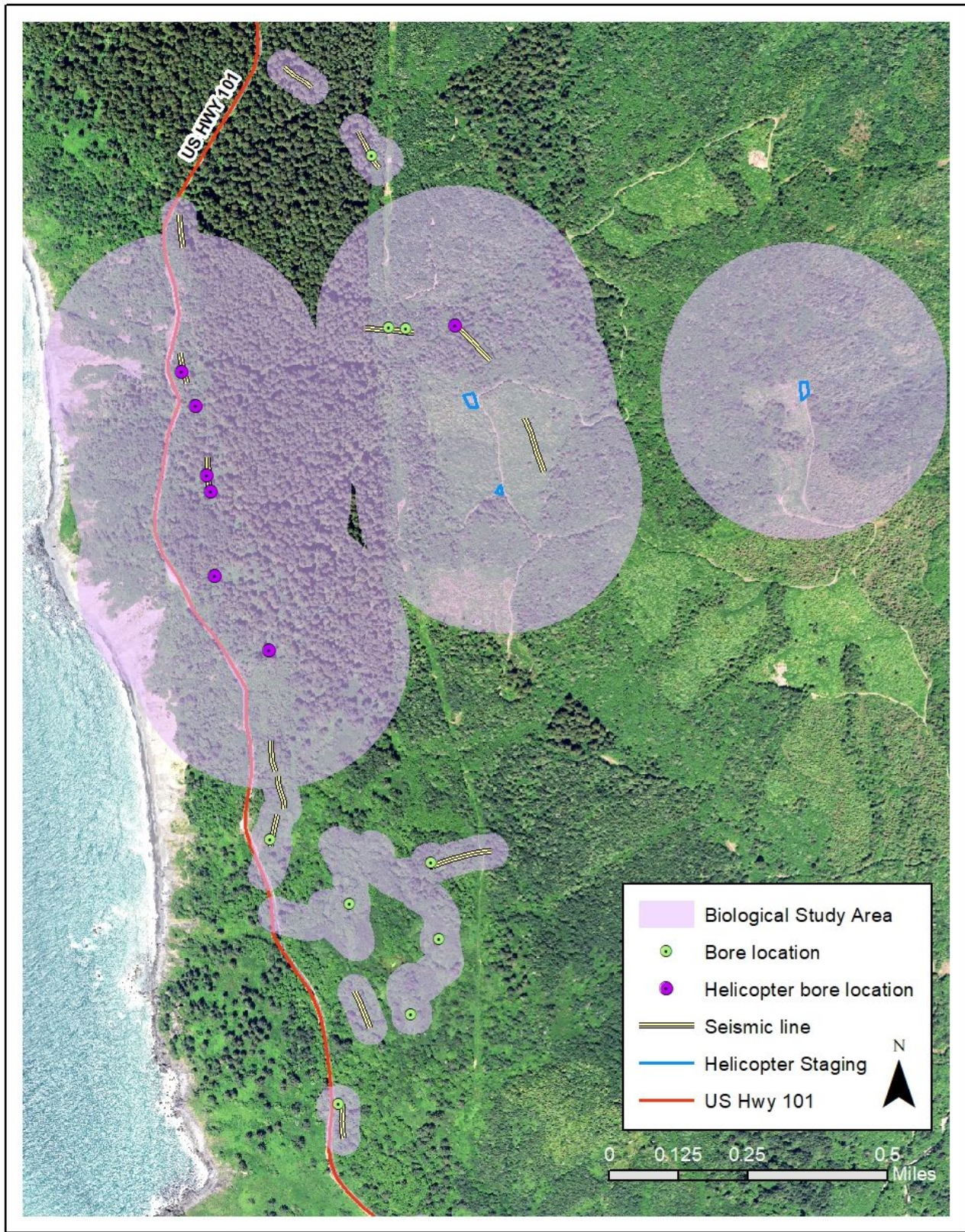


Figure 3. Biological Study Area

The BSA includes all areas of potential indirect effects and consists of the project footprint (e.g., bore holes, seismic lines, staging areas and road work) and a 165- to 1,320-foot buffer zone for terrestrial resources. The 165-foot buffer¹ was used to assess the portion of the project that would be accessed from vehicles and on foot. The 1,320-foot buffer was used to assess work sites that would be accessed via helicopter. The BSA covers approximately 700 acres. Both the ESL and BSA comprise the DNCRSP, RNP, and GDRC land.

The project is located in northwest California within a mountainous region comprising elongated ranges and valleys that trend in a northwesterly direction. The region typically experiences wet, cool winters and moist, mild, foggy summers. Within the project limits, the average high temperature is 61 degrees Fahrenheit (°F), ranging from 66.8°F in July to 54.1°F in January; the average low temperature is 44.7°F, ranging from 39.6°F in January to 50.9°F in August. The average annual precipitation is 70.1 inches, with precipitation falling entirely as rain, mostly between October and May, but with an average of at least one inch of rain every month except July (0.44 inch) and August (0.61 inch). Marine fog is also a key component in providing moisture to the area, averaging 35-40 days of heavy fog per year (Midwestern Regional Climate Center).

The primary source of hydrology in the project limits is direct precipitation, runoff, and marine fog. The survey area is at the south end of the Smith River watershed (hydrologic unit code 18010101) (U.S. Geological Survey 2019). Aquatic resources in the BSA consist of small, intermittent streams, ephemeral streams, wetlands, and coastal features.

Natural Communities

Based on CDFW's Vegetation Classification and Mapping Program's (VegCamp) list of SNC (CDFW 2018b), the area contains the following SNC and associated alliances: Redwood Forest Alliance (G3/S3), Sitka Spruce Forest Alliance (G5/S2), Coastal Brambles Shrubland Alliance (G4/S3), and Red Alder Forest Alliance (G5/S4) (the sensitive *Alnus rubra* / *Rubus spectabilis* – *Sambucus racemosa* Association was present within the non-sensitive Red Alder Forest Alliance).

¹ This distance is based on an analysis from the Programmatic Letter of Concurrence for potential impacts to the marbled murrelet and northern spotted owl (USFWS 2014) that compares the estimated ambient sound levels with anticipated sound levels resulting from construction activities. The buffers are based on sound-related harassment distances of various activities for these species.

Other communities within the ESL not considered sensitive or not recognized by VegCamp are Douglas fir forest (G5/S4), cascara forest (undescribed), and ruderal vegetation and non-vegetated areas (undescribed).

Vegetation types within the ESL (see Figures 4 through 6) were identified and mapped according to SNC mapping protocols (CSP 2018a), a modified version of the *Survey of California Vegetation Classification and Mapping Standards* (CDFW 2018a), SNC list (CDFW 2018b), and established botanical survey protocols (CDFW 2018c) (see Appendix I). The vegetation alliance types in the ESL were identified based on vegetation data collected in the field, which were used later to classify the alliances using keys and descriptions available in the online edition of *The Manual of California Vegetation* (CNPS 2019b) and comparing the data to the CNPS alliance descriptions and membership rules.

Early seral (young-growth) and late seral (old-growth) redwood (*Sequoia sempervirens*) forests are the most dominant natural communities within the region, and constitute approximately 4.4 acres and 13.5 acres of the Environmental Study Limit (ESL), respectively. Recently logged redwood forest on GDRC land constitutes approximately 1.4 acres of the ESL.

Late-seral redwood forests are primarily found within DNCRSP and are characterized by dense stands of tall, needle-leaved evergreen trees dominated by redwood and with Sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), and Douglas-fir (*Pseudotsuga menziesii*) scattered throughout the forest. The shaded sub-canopy within the late seral forest is typically occupied by occasional red alder (*Alnus rubra*) and tanoak (*Notholithocarpus densiflorus*). The shrub layer frequently comprises dense understory of evergreen huckleberry (*Vaccinium ovatum*) and Pacific rhododendron (*Rhododendron macrophyllum*) with salal (*Gaultheria shallon*), false azalea (*Menziesia ferruginea*) and California red huckleberry (*Vaccinium parvifolium*) also present. Within the herbaceous layer, sword fern (*Polystichum munitum*), deer fern (*Struthiopteris spicant*), wild ginger (*Asarum caudatum*), western wake robin (*Trillium ovatum* ssp. *ovatum*), redwood violet (*Viola sempervirens*), Smith's fairy bells (*Prosartes smithii*), purple sweet cicely (*Osmorhiza purpurea*), baneberry (*Actaea rubra*), and redwood sorrel (*Oxalis oregana*) are the most common species.

Sitka spruce forest is common along the immediate coast within the region; however, it is only represented by approximately 0.7 acre within the ESL. Late seral Sitka spruce forests are found within DNCRSP and are characterized by dense stands of tall, needle-leaved evergreen trees dominated by Sitka spruce with the occasional redwood, western hemlock, and Douglas-fir. Scattered patches of red alder and cascara (*Frangula purshiana* spp. *Purshiana*) typically occupy the sub-canopy of Sitka spruce forests. A dense understory of brambles (*Rubus* spp.) frequently

occupies the shrub layer while the herbaceous layer is often dominated by dense patches of sword fern. Wild ginger, redwood sorrel, two-leaved false-Solomon's-seal (*Maianthemum dilatatum*), and various mosses are the most common species within the herbaceous layer.

Coastal brambles are typically found within mesic meadows and forest openings within the ESL. Coastal brambles are common along the immediate coast and are represented by approximately 3.5 acres within the ESL. Dense patches of salmonberry (*Rubus spectabilis*) dominate most coastal bramble patches although California blackberry (*Rubus ursinus*) is more common in open herb and grass-dominated meadows. Thimbleberry (*Rubus parviflorus*) patches are common within disturbed open sites under power lines. Red alder and cascara occasionally occur within coastal bramble patches, although trees are typically restricted to the edges of these patches. Additional species found within the shrub layer include red elderberry (*Sambucus racemosa* var. *racemosa*), creambush ocean-spray (*Holodiscus discolor*), salal, and thimbleberry. The herbaceous layer within salmonberry-dominated brambles is typically sparsely populated by a handful of species that include sword fern, deer fern, soft Athyrium (*Athyrium filix-femina*), pig-a-back plant (*Tolmiea diplomenziesii*), Smith's fairy bells, milkmaids (*Cardamine californica*), coast man-root, and Mexican hedge-nettle (*Stachys mexicana*). Within California-blackberry dominated meadows, herbaceous species diversity is typically higher and includes species such as bracken fern (*Pteridium aquilinum* var. *pubescens*), Pacific reed-grass (*Calamagrostis nutkaensis*), coast man-root, giant horsetail (*Equisetum telmateia* ssp. *braunii*), cow parsnip (*Heracleum maximum*), stinging nettle (*Urtica dioica*), giant vetch (*Vicia gigantea*), Douglas iris (*Iris douglasiana*), Mexican hedge-nettle, sword fern, Hall's bentgrass (*Agrostis hallii*), and other species.

Red alder forests had the highest acreage of any natural community within the ESL, comprising approximately 24.1 acres. Red alder forests typically occur within drainages, intermittent streams, creeks, and mesic slopes and roadsides within the ESL. Occasional associates of these deciduous forests include cascara and Sitka spruce. Several species of brambles (*Rubus spectabilis*, *R. parviflorus*, *R. ursinus*) and red elderberry often form a dense impenetrable wall of vegetation within the understory. Sword fern, coast man-root (*Marah oregana*), stinging nettle, Mexican hedge-nettle, curled starwort (*Stellaria crispa*), candy flower (*Claytonia sibirica*), milkmaids, taper fruit short scale sedge (*Carex leptopoda*), and two-leaved false-Solomon's-seal are typical components of the herbaceous layer.

Douglas-fir forest represents approximately 9.4 acres within the ESL making this one of the more common natural communities within the ESL (Appendix L). This community is common and widespread throughout the ESL and surrounding area. It occurs as early-seral (young growth) forest and as mid- to late-seral (mature and old-growth) forest within the ESL. Red

alder is often a codominant within the canopy while redwood, Sitka spruce and tanoak are present in lesser abundance. Depending on the aspect and seral stage, the shrub layer frequently comprises evergreen huckleberry, red elderberry, coyote brush (*Baccharis pilularis*), creambush oceanspray, salal, bush monkeyflower (*Diplacus [Mimulus] aurantiacus*) and several species of brambles. Other than a high cover of sword fern, the understory herbaceous layer is typically sparsely occupied by three-flowered bedstraw (*Galium triflorum*), Pacific starflower (*Lysimachia latifolia*), Mexican hedge-nettle, two-leaved false-Solomon's-seal, nodding trisetum (*Trisetum cernuum*), Henderson's sedge (*Carex hendersonii*), and mosses such as Oregon beaked moss (*Kindbergia oregana*). Festoons of sweet-licorice fern (*Polypodium glycyrrhiza*) and leather-leaved polypody (*Polypodium scolieri*) often occur on large branches of old-growth Douglas-fir trees.

Cascara forests, comprising dense, monodominant stands of cascara, are typically found within previously disturbed habitats and along the edges of meadows adjacent to the coast. These forests are represented by approximately 7.4 acres within the ESL. Red alder, Douglas-fir and Sitka spruce occasionally occur within these deciduous forests and especially where cascara forests intergrade with forests dominated by these species. The shrub layer is often dominated by red elderberry and several species of brambles. California blackberry is frequently the most dominant understory shrub species, comprising up to 70% of the shrub cover. The herbaceous layer is typically sparsely populated by a handful of species, with sword fern being the most common species. Coast man-root, cow parsnip, stinging nettle, Mexican hedge-nettle, curled starwort, candy flower, narrow-flowered brome (*Bromus vulgaris*), Pacific reed grass, taper fruit short scale sedge, fringe cups (*Tellima grandiflora*), bentgrass, ox-eye daisy (*Leucanthemum vulgare*), and common creeping buttercup (*Ranunculus repens*) are typical components of the herbaceous layer.

Ruderal vegetation is characterized by a dominance of non-native or invasive species. Ruderal vegetation occurs along the immediate shoulders of U.S. 101 and along GDRC roads and constitutes approximately 0.7 acre within the ESL. Non-vegetated areas, such as the pavement and shoulder of U.S. 101, constitute approximately 1.3 acres of the ESL.

Habitat Connectivity

The California Essential Habitat Connectivity (CEHC) Project has identified large, relatively natural blocks of habitat (natural landscape blocks) across California and Essential Connectivity Areas (ECAs) that provide essential connectivity between the habitat blocks. ECAs are identified as lands likely to be important to wildlife movement between large, mostly natural areas at the statewide level. The BSA is located within the North Coast Ecoregion and is within a natural landscape block and an ECA. The terrain and vegetation provide connectivity primarily to the south and east of the project area.

Some areas within the BSA are too steep (e.g., cliffs) to support wildlife movement corridors. The presence of vehicle traffic, ongoing roadway maintenance, and steep topography may limit or alter wildlife dispersal and migration through segments of the BSA, particularly along the existing U.S. 101 alignment.

Environmentally Sensitive Habitat Areas

Environmentally sensitive habitat areas are defined by the California Coastal Act as “any area in which plant or animal life or their habitats are either rare, 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 (Section 30107.5).” Del Norte County’s 2003 General Plan defines the following as ESHAs: coastal sand dunes, coastal estuaries, coastal wetlands, and riparian vegetation. Coastal wetlands and riparian areas are within the project’s ESL.

As defined by the CDFW (CDFW 2019a), other sensitive habitats, such as occupied special-status wildlife habitat and SNC (e.g., redwood forest, Sitka spruce forest, coastal brambles shrubland, and red alder forest), are found within the ESL. During the Coastal Development Permit (CDP) process, Del Norte County may also consider these sensitive habitats as ESHAs.

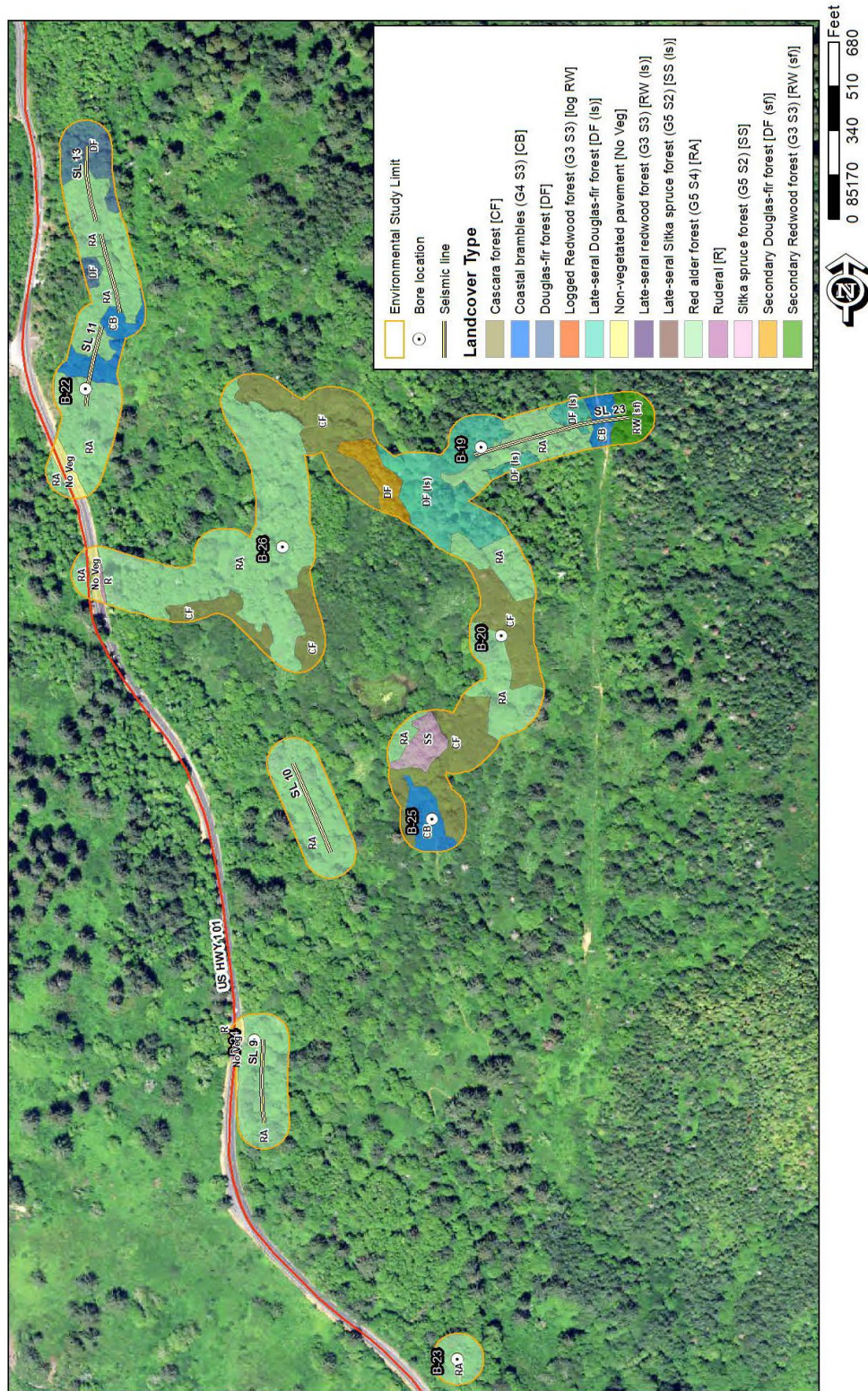
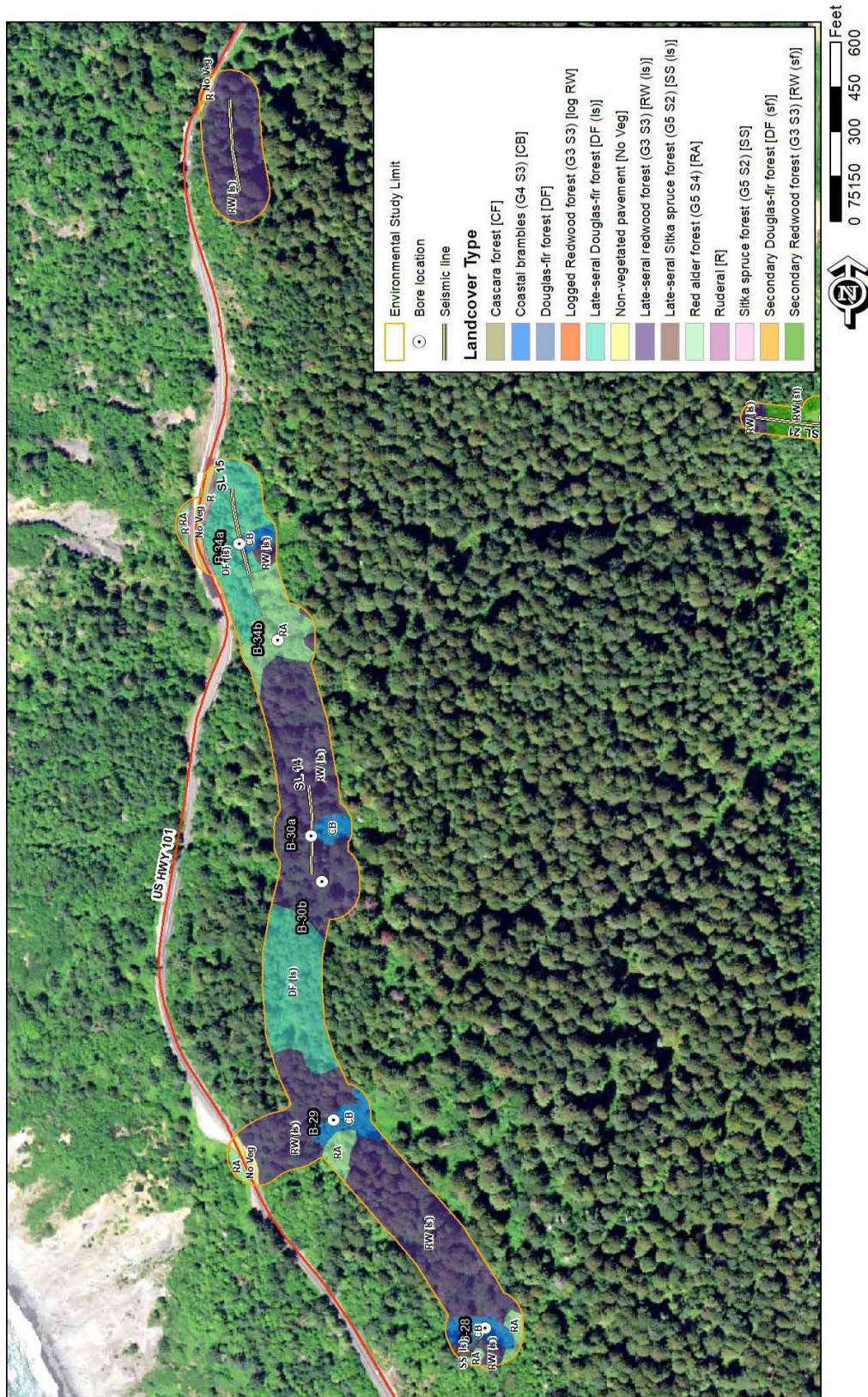


Figure 4. Vegetation Types Within The ESL



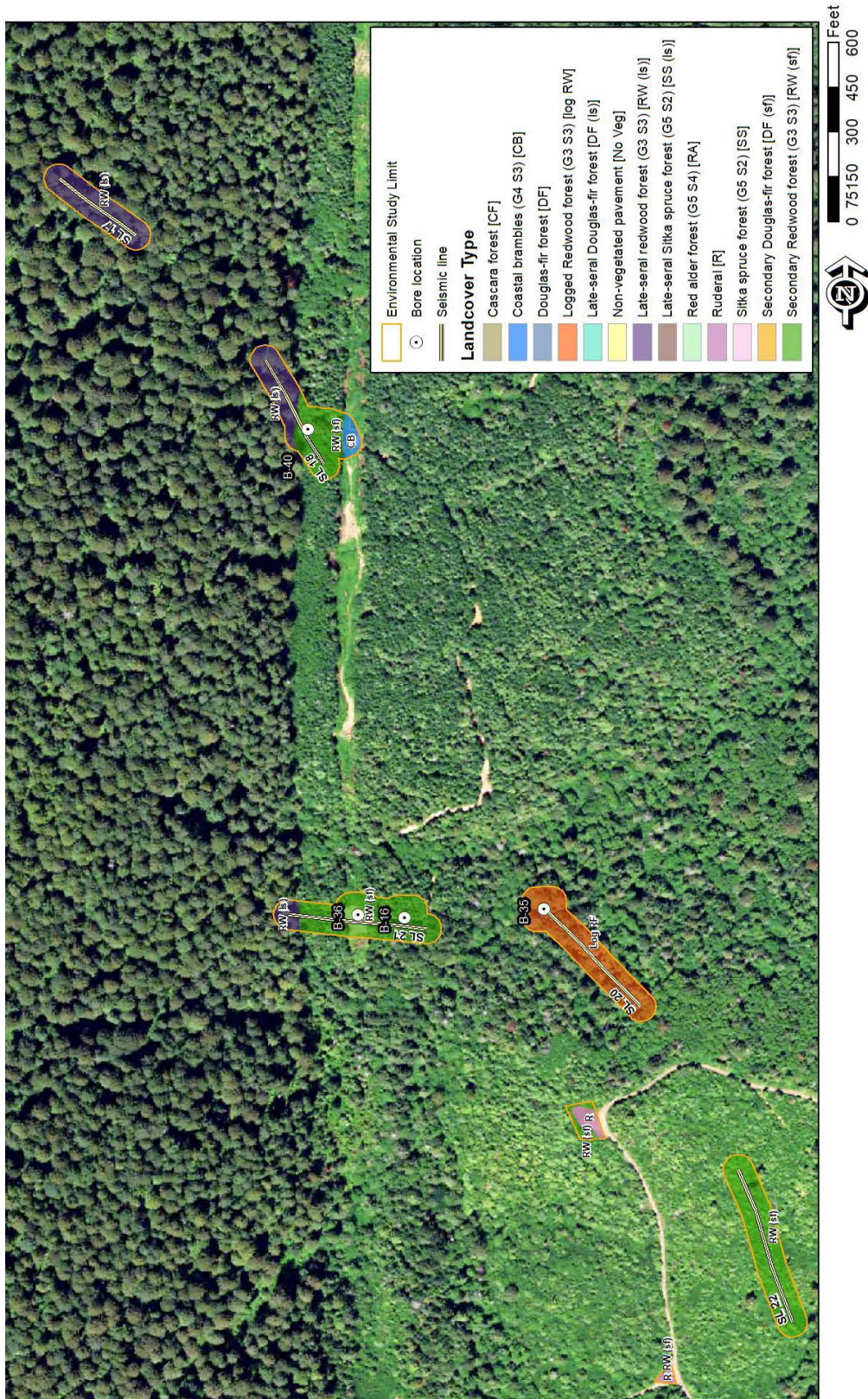


Figure 6. Vegetation Types Within The ESL

Wetlands and Other Waters

The ESL supports aquatic features that are likely jurisdictional waters of the U.S. and waters of the state, and regulated coastal riparian features (Caltrans 2019a), including Relatively Permanent Waters (RPW), Non-Relatively Permanent Waters (Non-RPW), Clean Water Act Section 404 Wetlands, and riparian features, per Coastal Commission guidelines. The USACE, Regional Water Quality Control Board (RWQCB), CDFW, California Coastal Commission (CCC), and/or U.S. Environmental Protection Agency (U.S. EPA) regulate some or all of these streams.

In total, 0.186 acre of potential waters of the U.S. and state were identified in the survey area, consisting of 0.135 acre of palustrine emergent nonpersistent wetland and 0.051 acre of non-wetland waters. Of these, 0.172 acre are within the Coastal Zone would also be considered coastal jurisdictional features. In addition, 0.424 acre of one-parameter potentially jurisdictional coastal features were also identified, for a total of 0.596 acre of coastal waters (0.014 acre of non-wetland waters of the U.S. are outside of the Coastal Zone) (Caltrans 2019a). See Appendix I for wetland and other waters mapping.

Wetlands and waters of the U.S. and state, and coastal jurisdictional features regulated by the California Coastal Commission (CCC), would not be impacted by the geotechnical investigation.

Plant Species

Several databases² were consulted to determine which special-status plant species may occur in the BSA (see Appendix B). Aerial photography, topographic maps, and field survey data were reviewed. Analysis of the searches and additional rare plant records revealed 59 California Rare Plant Rank (CRPR)³ 1 through 4 plant taxa with the potential to occur within the vegetation and

² USFWS Information for Planning and Conservation Report for the Project Area (USFWS 2019), CDFW California Natural Diversity Database (CNDDDB) for the Childs Hill and Requa quadrangles and surrounding U.S. Geological Survey 7.5-minute topographic quadrangles (CDFW 2019a), and the California Native Plant Society's Inventory of Rare and Endangered Plants Database for Childs Hill and Requa quadrangles and surrounding U.S. Geological Survey topographic quadrangles (CNPS 2019a).

³ **California Rare Plant Rank (CRPR)**

1B = Rank 1B species: rare, threatened, or endangered in California and elsewhere.

2B = Rank 2B species: rare, threatened, or endangered in California but more common elsewhere.

3 = Review List: Plants about which more information is needed.

4 = Watch List: Plants of limited distribution.

Threat rank extensions:

.1 = Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat).

.2 = Moderately threatened in California (20%-80% occurrences threatened/ moderate degree and immediacy of threat).

.3 = Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats).

habitat types present in the BSA (Caltrans 2019b). See Appendix G for a list of special-status plants with potential to occur in project vicinity.

Comprehensive, systematic botanical surveys were conducted throughout all accessible areas of the ESL between April 15 through July 31, 2019 (see Appendix F for survey dates), and timed to coincide with the flowering and identification periods of the potentially occurring special-status plant species. The field surveys followed the CDFW guidelines (CDFW 2018c), as well as the CSP floristic survey and invasive species mapping protocols required when surveying on CSP land (CSP 2018a, 2018b). All special-status plant species potentially occurring in the ESL bloom during the range of dates when surveys were conducted or would otherwise be evident and identifiable.

All plant species observed during the surveys were recorded (see Appendix J). Within the ESL, the surveys identified 239 vascular and nonvascular plant and lichen taxa within 72 plant families, including 9 tree species, 36 shrub species, 126 herbaceous species, 44 graminoid species, 9 fern species, 7 lichen taxa, and 8 bryophyte taxa. No special-status plants (CRPR 1 and 2) were identified in the ESL, though six CRPR 4 plants were found. The CRPR 4 species do not qualify as special-status species under CEQA based on their documented distribution and abundance within the region (Caltrans 2019b).

Animal Species

Record searches⁴ and habitat assessments were conducted to determine whether special-status⁵ wildlife species have the potential to occur in the BSA. Species that were queried but do not have potential habitat in the BSA are not discussed in this document as CEQA, FESA, and CESA only require analysis of species that could potentially be affected by a project. Special-status wildlife species with the potential to occur in the BSA are discussed further below. See

⁴ USFWS Information for Planning and Conservation Report for the Project Area (USFWS 2019), CDFW CNDDDB for the Childs Hill and Requa quadrangles and surrounding U.S. Geological Survey 7.5-minute topographic quadrangles (CDFW 2019a), and the NMFS Species List (NMFS 2016; accessed September 2019).

⁵ **Federal**

FE = listed as endangered under FESA

FT = listed as threatened under FESA

FD = removed from the FESA list

FPT = Federally proposed threatened

State

SE = listed as endangered under CESA

ST = listed as threatened under CESA

SFP = designated as a fully protected endangered species under the CFGC

SCE = State candidate endangered

SCT = State candidate threatened

SSC = State species of special concern

Appendix H for the list of special-status species with the potential to occur in the project vicinity based on queries, and the rationale on whether or not there was potential habitat in the BSA.

The special-status species not listed as threatened or endangered include the Pacific tailed-frog (*Ascaphus truei*, SSC), northern red-legged frog (NRLF) (*Rana aurora*, SSC), southern torrent salamander (*Rhyacotriton variegatus*, SSC), ring-tailed cat (*Bassariscus astutus*, SFP), Sonoma tree vole (*Arborimus pomo*, SSC), white-footed vole (*Arborimus albipes*, SSC), Townsend's big-eared bat (*Corynorhinus townsendii*, SSC), and the fisher West Coast Distinct Population Segment (DPS) (*Pekania pennanti*, FPT/SSC):

- *Pacific tailed frog*: a SSC that occurs in coastal Northern California and inland to the Cascade Mountains. It inhabits cold, clear, rocky perennial montane streams in wet forests. They may also occur in watercourses that dry intermittently. Reproduction is aquatic and, on the coast, occurs in the spring and summer. Upland, non-reproductive habitat for this species consists of moist areas with undergrowth vegetation and/or litter for refugia within several hundred feet of an aquatic feature.

There are 14 occurrences within approximately five miles of the ESL, with the nearest occurrences reported from Wilson Creek or its tributaries (CDFW 2019a). There is potentially suitable habitat throughout the project area; therefore, presence is assumed throughout the ESL.

- *Northern red-legged frog (NRLF)*: a SSC that occurs in coastal Northern California. It inhabits streams and rivers in forests that have deep pools and riffles and sunny sandy or rocky banks for basking. The species is considered highly terrestrial, often inhabiting moist areas far from water. Reproduction is aquatic and, in Northern California, occurs from November to March. There are 18 occurrences reported within five miles of the ESL. NRLF was observed within the ESL during summer botanical surveys and there is suitable habitat throughout the project area; therefore, presence is assumed throughout the ESL.
- *Southern torrent salamander*: a SSC that is found in coastal drainages from Oregon south to Mendocino County. It inhabits cold streams and seeps that are shaded by trees or shrubs, typically with moist rock and talus. The species is primarily aquatic, although they may use moist, riparian areas for non-reproductive habitat. Reproduction is aquatic and occurs throughout the year, with peak egg laying in August and September. There are 14 occurrences reported within five miles of the ESL, with multiple occurrences associated with Wilson Creek (CDFW 2019a). There is potentially suitable habitat throughout the project area; therefore, presence is assumed throughout the ESL.

- **Ring-tailed cat:** a SFP species. It is a member of the raccoon family (Procyonidae) that may be found in fragmented and disturbed areas throughout the western U.S., including most temperate forests in California. Ring-tailed cats are nocturnal carnivores that forage at night for a variety of prey (primarily small mammals, invertebrates, birds, and reptiles), but supplement their diet with plants or fruit. In northwestern California, ring-tailed cats tend to select diurnal rest sites in proximity to steep slopes and water sources. They frequently change rest sites, although some may be revisited regularly. Dens can be located in rock crevices, living and dead hollow trees, logs, brush piles, buildings, and other manmade structures (Myers 2010). This species gives birth between May and June. Female ring-tailed cats may regularly move young between dens (Poglayen-Neuwall and Toweill 1988). No occurrence information is available, as CNDDDB does not track ring-tailed cat observations (CDFW 2019a). No potential natal dens were observed within the ESL, however there are potential den sites throughout the project area. Given this, presence is assumed throughout the ESL.
- ***Sonoma tree vole:*** a SSC that is found in Douglas-fir, redwood, and montane hardwood-conifer forest habitat types (Zeiner et al., 1990) along the north coast from Sonoma County to the Oregon border. The voles are primarily nocturnal and spend the majority of their time in the tree canopy where they nest and feed on fir needles. Male voles have been documented building nests at the base of trees beneath duff but are typically arboreal (Zeiner et al., 1990). Their home range is small, involving one to several trees. The species breeds year-round but mostly February through September. There are two occurrences recorded within five miles of the ESL. There is potentially suitable habitat throughout the project area; therefore, presence is assumed throughout the ESL.
- ***White-footed vole:*** a SSC that within California is only known to occur in Humboldt and Del Norte counties. White-footed voles are found in coastal forests dominated by redwood, Douglas-fir, and within riparian forest with dense alders and other deciduous trees and shrubs. They are primarily nocturnal. The species breeds year-round; however, primarily February through September. The vole has not been reported within five miles of the ESL (CDFW 2019a). However, there is potentially suitable habitat throughout the project area; therefore, presence is assumed throughout the ESL.
- ***Townsend's big-eared bat:*** a SSC that is distributed from the southern portion of British Columbia south along the Pacific Coast to central Mexico and east into the Great Plains. Townsend's big-eared bat uses a variety of habitat types that include coniferous forests, riparian communities, and active agricultural areas. It primarily roosts in caves, but has been documented roosting in rock crevices, trees, buildings, and bridges. Their prey is

primarily moth species, and they forage along edge habitat near streams and in forested areas (Western Bat Working Group 2017). Maternity colonies form between March and June (based on local climactic factors), with a single pup born between May and July. The nearest CNDDDB occurrence for Townsend's big-eared bat was recorded in 1945 approximately 8 miles south of the BSA near the town of Klamath and the Klamath River (CDFW 2019a). There is potentially suitable habitat for Townsend's big-eared bat; therefore, presence is assumed throughout the ESL.

- *Fisher, West Coast DPS*: an FPT and SSC species; given it is listed as FPT, it is discussed in the next section.

Migratory Birds: though not considered special-status, migratory birds and raptors are protected by several regulations, including the Federal Migratory Bird Treaty Act (MBTA) (15 USC 703-711), Title 50 CFR Part 21 and 50 CFR Part 10, and the CDFG Game Code Sections 3503, 3513, and 3800. The MBTA provides protection in part by restricting the disturbance of nests during the bird nesting season. Some species of birds, primarily raptors, have additional protections for their unoccupied nests because they may be reused year after year. Habitat for migratory birds and raptors is present within and adjacent to the BSA.

Non-Listed Bat Species: other non-listed species have the potential to occur in the project area, including the fringed myotis (*Myotis thysanodes*) and long-eared myotis (*Myotis evotis*). These species generally occur in caves and other crevices and have been documented in old-growth redwood in and near the project area (CDFW 2019a). Though non-listed, CDFW often takes special considerations for bats. There is potentially suitable habitat for the fringed myotis and long-eared myotis throughout the area; therefore, presence is assumed throughout the ESL.

Threatened and Endangered Species

Record reviews⁴ indicate special-status⁵ wildlife species have the potential to occur in the project area (See Appendix B). Habitat assessments and agency coordination determined that several threatened and endangered wildlife species have the potential to occur in BSA. Species that do not have the potential to occur in the BSA are not discussed. See Appendix H for the list of potential special-status species with the potential to occur in the project vicinity based on queries, and the rationale on whether or not there was potential habitat in the BSA.

Threatened and endangered species with potential to occur in the BSA include the Foothill yellow-legged frog (FYLF) (*Rana boylei*, SCT), fisher West Coast DPS (*Pekania pennanti*, FPT/SSC), Humboldt marten (*Martes caurina humboldtensis*, FPT/SE), northern spotted owl (NSO) (*Strix occidentalis caurina*, FT/ST), and marbled murrelet (MAMU) (*Brachyramphus*

marmoratus, FT/SE). See the section above for special-status species that are not threatened or endangered.

- Foothill yellow-legged frog (FYLF)*: a SCT species with a range from northern Oregon (Santiam River) west of the Cascade Mountains south to the San Gabriel Mountains (San Gabriel River) and along the western side of the Sierra Nevada range to Kern County. FYLF is found primarily in forests and woodlands in slow, shallow, gravel-bottomed streams and rivers from sea level to 6,700 feet (Jennings and Hayes, 1994; Stebbins 2003). During their different life stages, the FYLF use aquatic habitat types that vary in temperature and comprise riffles, pools, and glides. Reproduction is aquatic and typically occurs between March and May. Upland, non-reproductive habitat for the FYLF consists of moist areas with undergrowth vegetation and/or litter for refugia, often within several hundred feet of an aquatic feature. There is one occurrence within five miles of the ESL and two occurrences within six and seven miles of the ESL, respectively. There is potentially suitable habitat throughout the project area; therefore, presence is assumed throughout the ESL.
- Fisher, West Coast DPS*: a FPT species, the Northern California Evolutionary Significant Unit is a SSC. Fisher occurs in mature, second growth, and old-growth redwood and Douglas-fir stands (Slauson et al., 2003; Zielinski et al., 2004). Characteristics of fisher habitat include coniferous forests with high canopy closure, multiple canopy layers, and large trees, with snags, cavities, and hollow logs for resting and natal and maternal dens (Zielinski et al., 2004). Fisher hunt exclusively in forested habitats and generally avoid openings (Buskirk and Powell, 1994). The species generally gives birth in March and April. Home range size varies but in California is thought to be roughly 50 square miles for males and 18 square miles for females (Buskirk and Powell, 1994). Trees suitable for fisher den sites include conifers greater or equal to 22 inches diameter at breast height (dbh) and hardwoods greater or equal to 18 inches dbh. Suitably-sized trees with the following characteristics were considered potential fisher den sites: any broken-topped tree with a minimum diameter at the break of 18 inches or larger; trees with one or more limbs 12 inches or greater in diameter, with brooms, deformities, or mistletoe; and trees with a cavity (or void within a tree bole or large limb), with a relatively small opening; includes all cavities with entrances 1.8 to 3.8 inches (USFWS 2016b).

There are no CNDDDB records within five miles of the ESL; however, fisher surveys have been conducted within the vicinity of the project by GDRC. The surveys included 26 survey stations, and fisher were positively detected at 17 sites. Fourteen survey stations

were within five miles of the project's ESL. There is potentially suitable foraging, resting, and denning habitat in the BSA and potential for the fisher West Coast DPS to occur in or move through the BSA; therefore, presence is assumed throughout the ESL. USFWS has not identified critical habitat for fisher.

- *Humboldt marten*: a SE and FPT species. The current range of Humboldt marten is a fraction of its former range, and it is now only found in small areas of Del Norte County, northern Humboldt County, and western Siskiyou County (CDFW 2018d). Humboldt marten live in old-growth coast redwood and Douglas-fir forest with dense shrub understory and in dense to open forest in rocky serpentine areas, also with dense shrub cover. Both habitats provide structures (tree cavities, large snags and logs, and rock piles) for denning, resting, and cover (CDFW 2018d).

There are no CNDDDB records within five miles of the ESL; however, marten surveys have been conducted within the vicinity of the project by GDRC. The surveys included 26 survey stations, and marten were positively detected at 1 site. Fourteen survey stations were within five miles of the project's ESL. The single marten detection occurred in the Hunter Creek Watershed approximately 3.3 miles southeast of the ESL (GDRC 2018, unpublished data). There is potentially suitable foraging, resting, or denning habitat in the BSA and potential for the Humboldt marten to occur in or move through the BSA. Given this, presence is assumed throughout the ESL. USFWS has not identified critical habitat for marten.

- *Northern spotted owl (NSO)*: a FT and ST species. NSO is one of three subspecies of spotted owl [others are the Mexican spotted owl (*Strix occidentalis lucida*) and California spotted owl (*Strix occidentalis occidentalis*)]. NSO occur in Northern California, western Oregon and Washington, and southwestern British Columbia. In northern California, they inhabit structurally complex old-growth mixed conifer, redwood, and Douglas-fir forests, and primarily nest in the broken tops, cavities, or on platforms (e.g., mistletoe brooms) of old-growth Douglas-fir (83%) and redwood trees (9%), with a mean minimum dbh of 46.9 inches (LaHaye and Gutierrez, 1999). However, they have been recorded nesting in smaller diameter trees that contain the appropriate structural elements. Nesting typically begins in late March or April, and the young leave the nest in late May or June but are fed by their parents until late August or September, after which time they disperse to new territories (Forsman et al., 1984). NSO spend most of the day roosting in trees and generally forage at night.

CDFW's Spotted Owl Database (CDFW 2019c) contains 16 activity centers within 5 miles and 3 activity centers within 1.3 miles of the BSA. The three NSO activity centers nearest the BSA are associated with Wilson Creek. GDRC has surveyed and detected NSO west of Wilson Creek Road, however none of these recorded activity centers are near the project. Presence of NSO was assumed for the entire ESL due to the presence of suitable nesting and roosting habitat, as well as known occurrences in the vicinity of the project (CDFW 2019c). There is no designated NSO critical habitat within the BSA.

- *Marbled murrelet (MAMU)*: a FT and SE species. MAMU is a small seabird that occurs in Alaska, British Columbia, Washington, Oregon, and California. Populations have declined, in part due to loss and fragmentation of nesting habitat from harvesting of old-growth coniferous forests. MAMU nest in old-growth coniferous forests within 52 miles of the coast and forage on small fish and crustaceans in nearshore ocean waters (Hamer 1995). They typically nest on large moss-covered branches high in old-growth coniferous trees. In California, nest initiation has been reported from mid-March to mid-August, and chicks fledge by mid-September (Hamer and Nelson, 1995). During the non-breeding season, MAMU 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). Non-breeding MAMU fly inland above the canopy in groups and vocalize while flying, whereas nesting murrelets fly below the forest canopy in singles and pairs and approach nests silently (Jodice and Collopy, 2000). In one study in central California, the number of inland flights during the non-breeding season (fall and winter) was about half of those during the breeding season (spring and summer) (Naslund 1993). Few or no MAMU were detected from August to October, which corresponded with the flightless molting period (Naslund 1993). MAMU are thought to use inland old-growth or mature forests for roosting, courtship, and investigating nest sites during the non-breeding season (Paton and Ralph 1990).

There are six CNDDDB occurrences reported within five miles of the BSA. The nearest occurrence (#106) was reported in 1992 near an unnamed tributary to Wilson Creek (CDFW 2019a). Due to suitable habitat, MAMU presence was assumed for portions of the BSA.

Approximately 400 acres of critical habitat for MAMU are within the BSA. The primary constituent elements (PCE) of critical habitat for MAMU are individual trees with potential nesting platforms; forested areas within 0.5 mile of individual trees with potential nesting platforms; and canopy height of at least one-half the site-potential tree height (USFWS 2016a). These PCEs are present within some areas of the BSA.

Invasive Species

The California Invasive Plant Council (Cal-IPC) provides an overall rating for all plants listed in the Invasive Plant Inventory for California (Cal-IPC 2019). Appendix K lists the invasive plant species that were identified during the 2019 aquatic resources delineation and botanical report (Caltrans 2019a, b), with their California Department of Food and Agriculture (CDFA) and Cal-IPC ratings (CDFA 2019; Cal-IPC 2019).

Invasive bird species are known to exist within the project area. Record review indicates that house sparrows (*Passer domesticus*), European starling (*Sturnus vulgaris*), Eurasian collared dove (*Streptopelia decaocto*), and brown-headed cowbirds (*Molothrus ater*) may occur within or adjacent to the BSA. These species are primarily associated with human disturbance, including agricultural expansion and deforestation.

The Barred owl (*Strix varia*) is another invasive bird species known to occur in the BSA. It is closely monitored by USFWS and CDFW for exacerbating NSO population declines by reducing NSO site occupancy, reproduction, and survival (Dark et al., 1998; Gutiérrez et al., 2004 and 2007; Courtney et al., 2004; Olson et al., 2005; Anthony et al., 2006). There are six occurrences of barred owl within 0.5 mile of the ESL, all on GDRC land, with the most recent observation in 2018. The closest occurrence was recorded in 2017, approximately 500 feet north of bore hole B-16.

Discussion of Environmental Evaluation Question 2.6—Biological Resources

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW and Wildlife, U.S. FWS, or NOAA Fisheries?

Plant Species

Botanical surveys did not identify any special-status plant species within the ESL; however, six CRPR 4 plant species were identified: Methuselah's beard lichen (*Usnea longissima*), pacific golden-saxifrage (*Chrysosplenium glechomifolium*), nodding semaphore grass (*Pleuropogon refractus*), heart-leaved twayblade (*Listera cordata*), Suksdorf's wood-sorrel (*Oxalis suksdorfii*), and leafy-stemmed mitrewort (*Mitellastra caulescens*). These species were evaluated for local rarity or uniqueness to the region by reviewing distributional information available from herbarium records and regional records provided by CSP, RNP, GDRC and the CNDDDB. The data indicates that none of the six CRPR 4 species qualify as special-status species under CEQA based on their documented distribution and abundance within the region (Caltrans 2019b). Given this, a "No Impact" determination was made for potential impacts to plant species.

Animal Species

Caltrans has determined that project activities would have “No Impact” on special-status species that were queried but did not have potential habitat in the BSA. However, as mentioned in the Environmental Setting, the following special-status wildlife species do have the potential to occur in the project vicinity (see Appendix H):

Pacific Tailed-Frog, Northern Red-Legged Frog, and Southern Torrent Salamander

Potential effects to the Pacific Tailed-Frog (SSC), NRLF (SSC), and the Southern Torrent Salamander (SSC) would be associated with vegetation removal in upland habitat. Work would occur in the fall and winter, outside of the peak breeding season for these species (spring and summer), and no work would occur within aquatic breeding habitat.

Based on distance to aquatic habitat, most of the seismic lines, bore hole locations, access roads, and foot paths provide low- to medium-quality potential upland habitat for NRLF. Locations that may provide higher-quality habitat for these species include B-24, SL 16, SL 9, and sections of the access road along the Coastal Trail, based on proximity to streams, wetlands and the vegetation communities present. However, at B-24 no vegetation removal is proposed. At SL 16 and SL 9, work would be conducted on foot and no ground disturbance would occur. Access along higher-quality habitat of the Coastal Trail would be limited to the track drill rig and geotechnical trucks passing through to access other locations. In addition, there would be no more than several minutes of disruption each day and there would be no grading at any of these higher-quality habitat locations. Further, initial vegetation trimming/removal and grading at each location would take approximately 1-2 days, and work at each location is anticipated to be approximately 1-2 weeks. As described in the project description (Section 1.4.), a qualified biologist would be present to survey for and relocate individuals to suitable habitat, if required.

Due to the limited disturbance, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which they could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on these species. Given this, a determination was made that the project would have a “Less Than Significant Impact” on these species and their habitat.

Ring-Tailed Cat

Potential effects of the project on ring-tailed cat (SFP) include noise and visual disturbance from project activities and vegetation removal for equipment access, foot paths, seismic surveys, and bore holes. Boring locations were selected in areas with natural openings in the forest canopy, requiring limited tree removal. As such, vegetation scoped for removal largely comprises undergrowth (brambles, ferns, etc.) and small (<6-inch dbh) trees. This vegetation is unsuitable for denning but may provide foraging habitat. However, one mature alder tree and limbs of other mature trees scoped for removal may provide suitable denning habitat. Where suitable denning tree or limb removal is required, as a standard project measure (see Section 1.4), a qualified biologist would survey for potential dens prior to removal. If a potential den is identified, it would be monitored until absence was confirmed or CDFW would be contacted to establish appropriate steps. In addition, there is alternative suitable denning habitat that the ring-tailed cat could move to if necessary.

As described in the project description (Section 1.4.), all activities would occur in fall and winter, when ring-tailed cat would not be expected to have dependent young. Further, activities would occur during daylight hours (ring-tailed cats are primarily nocturnal), activities at each location would be short-term (approximately 1-2 weeks), and there is alternative suitable habitat available in the project vicinity that ring-tailed cat could temporarily move to if disturbed by project activities.

Due to the limited disturbance, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA, geotechnical investigation activities would not be anticipated to have a substantial impact on this species. Given this, a determination was made that the project would have a “Less Than Significant Impact” on the ring-tailed cat.

The ring-tailed cat SFP designation pre-dates CESA. The geotechnical investigation activities would not directly harm ring-tailed cat; therefore, there would be no State “Take” of this species as defined by CFGC.

Sonoma Tree Vole and White-Footed Vole

Potential impacts on Sonoma tree vole (SSC) and white-footed vole (SSC) are noise and visual disturbance from project activities and vegetation removal for equipment access, foot paths, seismic surveys, and bore holes. Boring locations were selected in areas with natural openings in the forest canopy to limit tree removal required and, where possible, away from waters. As such, vegetation scoped for removal largely comprises undergrowth (brambles, ferns, etc.) and small (<6-inch dbh), and is low-quality habitat. This vegetation is largely unsuitable for these primarily arboreal species but may provide marginal habitat. A mature alder tree and several limbs of other mature trees that may provide suitable habitat are scoped for removal; however, these locations are surrounded by alternative suitable habitat. As stated in the project description, all activities would occur in fall and winter, which is outside of the peak breeding season for voles. Furthermore, activities would occur during daylight hours (voles are primarily nocturnal), activities at each location would take approximately 1-2 weeks, and there is alternative suitable habitat available in the project vicinity that the voles could temporarily move to if disturbed by project activities.

Due to the limited disturbance, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which they could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on these species. Given this, a determination was made that the project would have a “Less Than Significant Impact” on these species and their habitat.

Townsend’s Big-Eared Bat

Potential impacts to Townsend’s big-eared bat (SSC) and other bats include noise and visual disturbance during daytime work activities, which could cause individuals to flush from daytime roosts. Large, late-seral and second-growth redwood and Douglas-fir are most likely to provide the tree hollows required for bat tree roosting. These higher-quality roosting trees exist within DNCRSP, with medium- to low-quality roosting habitat on GDRC land and within RNP. No mature redwoods, Douglas-fir, or other suitable bat roosting habitat would be removed for project activities. Furthermore, work locations are surrounded by areas of alternative suitable habitat, should noise and visual disturbances cause bats to flush from roosts.

As stated in the project description, all activities would occur between September 16 and January 31, which is outside of the breeding season for bats. Furthermore, activities at each location would take approximately 1-2 weeks, and there is alternative suitable habitat available in the project vicinity that the bats could temporarily move to if disturbed by project activities.

Due to the limited disturbance, minimal in-flight helicopter time, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which bats could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on these species. Given this, a determination was made that the project would have a “Less Than Significant Impact” on the Townsend’s big-eared bat.

Migratory Bird Treaty Act

No work would occur during the nesting bird season (February 1 to September 15), therefore nesting migratory birds would not be affected.

Threatened and Endangered Species

Caltrans has determined that project activities would have “No Impact” on special-status species that were queried but did not have potential habitat in the BSA. However, as mentioned in the Environmental Setting, the following threatened and endangered wildlife species do have the potential to occur in the project vicinity:

Foothill Yellow-legged Frog

Potential impacts to the Foothill yellow-legged frog FYLF (SCT) would be associated with vegetation removal within upland habitat for equipment access, foot paths, seismic surveys, and bore holes. Work would occur in the fall and winter, outside of the breeding season for the FYLF (spring), and no work would occur within aquatic breeding habitat.

Based on distance to aquatic habitat, most of the seismic lines, bore hole locations, access roads, and foot paths provide low- to medium-quality potential upland habitat for FYLF. Locations that may provide higher-quality habitat for FYLF, based on their proximity to streams, wetlands, and the vegetation communities present, include: B-24, SL 16, SL 9, and sections of the access road along the Coastal Trail. At B-24, no vegetation removal is proposed. At SL 16 and SL 9, work would be conducted on foot and no ground disturbance would occur. Access along higher-quality habitat of the Coastal Trail would be limited to the track drill rig; there would be no grading at any of these higher-quality habitat locations. Furthermore, initial vegetation trimming/removal and grading at each location would take approximately 1-2 days, and work at each location is anticipated to be approximately 1-2 weeks.

As described by the measures listed in Section 1.4, a qualified biologist would be present to survey for and relocate individuals to suitable habitat if required. If FYLF are discovered in

work areas, work would either be stopped until the species is out of the impact area, or CDFW would be contacted to establish the appropriate steps.

Due to the limited disturbance, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which they could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on FYLF. Given this, a determination was made that the project would have a “Less Than Significant Impact” on this species and their habitat.

The geotechnical investigation activities would not directly harm FYLF; therefore, per CESA, there would be no State “Take” of FYLF as defined by the CFGC.

Humboldt Marten and Fisher West Coast DPS

Potential effects of the project on Humboldt marten (FPT/SE) and fisher West Coast (DPS) (FPT/SSC) are noise and visual disturbance from project activities and vegetation removal for equipment access, foot paths, seismic surveys, and bore holes. Per FESA, there is no designated Humboldt marten or fisher critical habitat.

- **Noise and Visual:** Boring activities, seismic surveys, and helicopter flights could result in elevated noise and visual disturbance. The helicopter flights would occur between the helicopter staging areas and bore holes B-28, B-29, B-30 (A or B), B-34 (A or B), and B-35. Sound levels associated with the activities are estimated at 72.8 dB at 50 feet for bore hole drilling, 85 dB for seismic surveys, 81–90 dB for road grading, and 91–110 dB for helicopter flights (USFWS 2006). These levels may exceed ambient noise levels, estimated at ≤ 50 dB to 90 dB depending on the distance from U.S. 101.

Potential response of Humboldt marten and fisher to elevated noise and visual disturbance includes disruption of resting and foraging and displacement from the area. No known studies have been conducted to study potential noise and visual effects on these species; however, Zielinski et al. (2008) studied American marten (*Martes americana*) habitat use of areas open and closed to off-highway vehicles (OHV) such as trail bikes or trucks, which produce between 67 and 100 dB (USFWS 2006). There was no significant difference between marten use of open and closed OHV areas. With the exception of summer months, martens were consistently active during nighttime hours (Zielinski et al., 2008) in both open and closed OHV areas, which may be a strategy to avoid daytime noise disturbance and high levels of human activity. Though not conclusive, as recommended by the USFWS (Schmidt pers. comm. 2019), the American

marten study is provided as a possibility on how the Humboldt marten and fisher might be expected to respond to geotechnical investigation activities.

Work locations are surrounded by areas of alternative suitable habitat, should noise and visual disturbances cause marten or fisher to be displaced.

- **Habitat Modification:** Drilling locations have been selected in areas with natural openings in the forest canopy, which limits tree removal required, and away from waters where possible. As such, vegetation scoped for removal largely comprises undergrowth (brambles, ferns, etc.) and small (<6-inch dbh) trees. This vegetation is unsuitable for denning but may provide foraging habitat. A mature alder tree scoped for removal may provide suitable denning cavities. Several limbs of other mature trees that may be removed for helicopter bore locations or along access roads may also provide denning habitat.

A study conducted on the Sierra Nevada population of fisher provides evidence that fisher appear to be most common in areas with small levels (2.6%) of vegetation removal (Zielinski et al., 2013). Therefore, fisher are unlikely to relocate due to the minimal amount of vegetation removal caused by the project.

No studies were identified that provide data on the response of Humboldt marten to undergrowth vegetation removal. However, martens are known to rely heavily on mature forests with dense canopy closure and abundant quantities of large, woody debris on the ground (Buskirk and Zielinski, 1997). There would be minimal disturbance to these habitat characteristics.

Work locations are surrounded by areas of alternative suitable habitat, should the temporary habitat modification cause the marten or fisher to be displaced.

As described in the project description (Section 1.4.), all activities would occur between September 16 and January 31, which is outside of the reproductive season for marten and fisher. Furthermore, activities would occur during daylight hours (when these species are less likely to be active), activities at each location would take approximately 1-2 weeks, and there is alternative suitable habitat available in the project vicinity that marten and fisher could temporarily move to if disturbed by project activities. Where potentially suitable denning tree or limb removal is required, as a standard project measure, a qualified biologist would survey for potential denning cavities prior to removal and, if a potential den is identified, it would be

monitored until absence was confirmed or USFWS and/or CDFW would be contacted to establish appropriate steps.

Due to the limited disturbance, minimal in-flight helicopter time, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which they could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on these species. Given this, a determination was made that the project would have a “Less Than Significant Impact” on the Humboldt marten or fisher West Coast DPS. Based on the standard measures included as part of the project description and technical assistance with USFWS, per FESA, Caltrans anticipates the proposed project *may affect, not likely to adversely affect* Humboldt marten and fisher West Coast DPS. Caltrans would initiate consultation with USFWS after the circulation of this Initial Study.

The geotechnical investigation activities would not directly harm Humboldt marten or fisher; therefore, per CESA, there would be no State “Take” of Humboldt marten or fisher as defined by the CFGC.

Northern Spotted Owl

Potential effects of the project on NSO (FT/ST) are noise and visual disturbance, vegetation removal for equipment access, foot paths, seismic surveys, and bore holes, and tree damage from helicopter rotor wash. Per FESA, there is no designated NSO critical habitat within the BSA.

- **Noise and Visual:** Boring activities, seismic surveys, and helicopter flights could result in elevated noise and visual disturbance. The helicopter flights would occur between the helicopter staging areas and bore holes B-28, B-29, B-30 (A or B), B-34 (A or B), and B-35. The sound levels associated with the activities are estimated at 72.8 dB at 50 feet for bore hole drilling, 85 dB for seismic surveys, 81–90 dB for road grading, and 91–110 dB for helicopter flights (USFWS 2006). These levels may exceed ambient noise levels, estimated at ≤50 dB to 90 dB depending on the distance from U.S. 101.

Potential response of NSO to elevated noise and visual disturbance may include temporary displacement from roost sites and disruption of foraging during the non-breeding season. Spotted owls have been shown to habituate to noise, including noise from low-flying aircraft and chainsaws. Low-intensity chainsaw activity one hour in duration 328 feet from California spotted owl roost sites did not elicit a significant behavioral response or increased levels of fecal corticosterone (Temple and Gutierrez, 2003). Delaney et al. (1999) found that the Mexican spotted owl exhibited a strong site

tenacity response from helicopter disturbance during both nesting and non-nesting seasons (flushing only 13% of the time in both seasons), and did not flush at all when the noise stimuli was at least 344 feet away. Though not conclusive, the California and Mexican spotted owl data is provided as a possibility on how non-breeding NSO might be expected to respond to geotechnical investigation activities.

Work locations are surrounded by areas of alternative suitable habitat, should noise and visual disturbances cause NSO to be temporarily displaced.

- **Habitat Modification:** Boring locations are in areas with natural openings in the forest canopy; therefore, tree removal would be limited. Vegetation removal would largely comprise undergrowth (brambles, ferns, etc.) and small (<6-inch dbh) trees, and alders. This vegetation is unsuitable for nesting and roosting but may provide foraging habitat. No potentially suitable nest trees or limbs would be removed or trimmed.

The five bore holes that require a helicopter for equipment delivery and pick up could be exposed to helicopter rotor wash, which could damage potential nest tree limbs.

However, this is not expected to occur because the helicopter to be used, an AS350 Airbus Helicopter or similar, has a low downdraft and a 100- to 200-foot cable from the helicopter would be used to lower equipment below the forest canopy.

Work locations are surrounded by areas of alternative suitable habitat, should the temporary habitat modification cause NSO to be displaced.

As described in the project description (Section 1.4.), all activities would occur between September 16 and January 31, which is outside of the NSO breeding season. Further, activities would occur during daylight hours (NSO are primarily nocturnal), activities at each location would take approximately 1-2 weeks, no potentially suitable nest trees or limbs would be removed or trimmed, and there is alternative suitable habitat available in the project vicinity that NSO could temporarily move to if disturbed by project activities.

Due to the limited disturbance, minimal in-flight helicopter time, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which NSO could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on these species. Given this, a determination was made that the project would have a “Less Than Significant Impact” on NSO and its habitat.

Based on the standard measures included as part of the project description and technical assistance with USFWS, per FESA, Caltrans anticipates the proposed project *may affect, not likely to adversely affect* NSO. Caltrans would initiate consultation with USFWS after the circulation of this Initial Study.

The geotechnical investigation activities would not directly harm NSO; therefore, per CESA, there would be no State “Take” of NSO as defined by the CFGC.

Marbled Murrelet

Potential effects of the project on MAMU (FT/SE) are noise and visual disturbance, vegetation removal for equipment access, foot paths, seismic surveys, and bore holes, and tree damage from helicopter rotor wash. Per FESA, there is MAMU critical habitat within the BSA.

- **Noise and Visual:** Boring activities, seismic surveys, and helicopter flights could result in elevated noise and visual disturbance. The helicopter flights would occur between the helicopter staging areas and bore holes B-28, B-29, B-30 (A or B), B-34 (A or B), and B-35. The sound levels associated with the activities are estimated at 72.8 dB at 50 feet for bore hole drilling, 85 dB for seismic surveys, 81–90 dB for road grading, and 91–110 dB for helicopter flights (USFWS 2006). These levels may exceed ambient noise levels, estimated at ≤50 dB to 90 dB depending on the distance from U.S. 101.

Potential response of MAMU to elevated noise and visual disturbance may include temporary displacement from roost sites to other inland areas or back to the ocean and a disruption to non-breeding socialization. MAMU have shown to habituate and/or tolerate anthropogenic noise, including nearby loud music, chainsaws, and slamming car doors (Long and Ralph, 1998). In response to airplanes and helicopters flying approximately 900 feet over canopy height, observers noted that MAMU chicks either did not respond or did not react (Chinnici unpubl. data 1992). In response to aircrafts flying at low altitudes, chicks have been observed laying “flat” (Kerns 1994). No known studies have been conducted to study visual effects or audio impacts of helicopter activities on non-breeding MAMU. Evidence provided in the NSO section for Mexican spotted owl to helicopter disturbance indicates that some species of bird may not flush when the noise stimuli is at least 344 feet away (Delaney et al. 1999). Though not conclusive, most birds have similar frequency ranges and thresholds and may respond similarly to disturbance (Awbrey and Bowles, 1990); therefore, the data on breeding MAMU and breeding and nonbreeding Mexican spotted owl is provided as a possibility on how the non-breeding MAMU might be expected to respond to geotechnical investigation activities.

Work locations are surrounded by areas of alternative suitable habitat, should noise and visual disturbances cause MAMU to be temporarily displaced.

- **Habitat Modification:** Boring locations are in areas with natural openings in the forest canopy; therefore, tree removal would be limited. Vegetation removal would largely comprise undergrowth (brambles, ferns, etc.) and small (<6-inch dbh) trees, and alders. This vegetation is unsuitable for nesting, roosting, socializing activities, and foraging (since foraging occurs at sea). No potentially suitable nest trees or limbs would be removed or trimmed.

The five bore holes that require a helicopter for equipment delivery and pick up could be exposed to helicopter rotor wash, which could damage potential nest tree limbs. However, this is not expected to occur because the helicopter to be used, an AS350 Airbus Helicopter or similar, has a low downdraft and a 100- to 200-foot cable from the helicopter would be used to lower equipment below the forest canopy.

Work locations are surrounded by areas of alternative suitable habitat, should the temporary habitat modification cause MAMU to be displaced.

- **Critical Habitat:** Bore holes B-23, B-28, B-29, B-30A, B-30B, B-34A, B-34B, and B-40 are within critical habitat for the MAMU. All or portions of seismic lines SL 11, SL 12, SL 13, SL 14, SL 15, SL 16, SL 17, SL 18, and SL 21 are also within designated critical habitat for the MAMU. Impacts to MAMU critical habitat are described above in Habitat Modification.

As described in the project description (Section 1.4.), all activities would occur between September 16 and January 31, which is outside of the MAMU breeding season. Further, activities would occur during daylight hours (MAMU are primarily active at inland habitat during early dawn hours), activities at each location would take approximately 1-2 weeks, no potentially suitable nest trees or limbs would be removed or trimmed, and there is alternative suitable habitat available in the project vicinity that MAMU could temporarily move to if disturbed by project activities.

Due to the limited disturbance, minimal in-flight helicopter time, short-term nature of the activities, timing of work, and the abundance of suitable habitat in the BSA for which MAMU could relocate if necessary, geotechnical investigation activities would not be anticipated to have a substantial impact on MAMU. Given this, a determination was made that the project would have a “Less Than Significant Impact” on MAMU and its Critical Habitat.

Based on the standard measures included as part of the project description and technical assistance with USFWS, per FESA, Caltrans anticipates the proposed project *may affect, not likely to adversely affect* MAMU or their Critical Habitat. Caltrans would initiate consultation with USFWS after the circulation of this Initial Study.

The geotechnical investigation activities would not directly harm MAMU; therefore, per CESA, there would be no State “Take” of MAMU as defined by the CFGC.

Endangered Species Act Determinations for Species Not Discussed in Section 2.6

The following species and critical habitats have been identified as potentially occurring in the project vicinity; however, given they do not have the potential to occur in the BSA, they were not discussed in Section 2.6 (see Appendix H). As a result, per FESA, Caltrans has determined the project would have “No Effect” on the following federally listed species and critical habitats: Green sea turtle (*Chelonia mydas*), East Pacific DPS and critical habitat; Leatherback sea turtle (*Dermochelys coriacea*) and critical habitat; Olive Ridley sea turtle (*Lepidochelys olivacea*); Western snowy plover (*Charadrius alexandrinus nivosus*) and critical habitat; Yellow-billed cuckoo (*Coccyzus americanus*) and critical habitat; Short-tailed albatross (*Phoebastria [=Diomedea] albatrus*); NSO (*Strix occidentalis caurina*) critical habitat; Sei whale (*Balaenoptera borealis*); Blue whale (*Balaenoptera musculus*); Fin whale (*Balaenoptera physalus*); North Pacific right whale (*Eubalaena japonica*) and critical habitat; Humpback whale (*Megaptera novaeangliae*); Southern resident killer whale (*Orcinus orca*) and critical habitat; Longfin smelt (*Spirinchus thaleichthys*); Sperm whale (*Physeter catodon [=microcephalus]*); Marine Mammal Protection Act Cetaceans and Pinnipeds; Green sturgeon (*Acipenser medirostris*) Southern DPS and critical habitat; Tidewater goby (*Eucyclogobius newberryi*) and critical habitat; Coho salmon (*Oncorhynchus kisutch*) Southern Oregon/Northern California Coast Evolutionary Significant Unit (ESU) and critical habitat; Chinook salmon (*Oncorhynchus tshawytscha*) California Coastal ESU and critical habitat; Steelhead (*Oncorhynchus mykiss irideus*) Northern California DPS and critical habitat; Eulachon (*Thaleichthys pacificus*) and critical habitat; Oregon silverspot butterfly (*Speyeria zerene hippolyta*) and critical habitat; Western lily (*Lilium occidentale*); and McDonald’s rockcress (*Arabis mcdonaldiana*).

The following species have been identified as potentially occurring in the project vicinity; however, given they do not have the potential to occur in the BSA, they were not discussed in Section 2.6. As a result, given the project would not directly harm the following species, per CESA, Caltrans has determined the project would not result in “Take” of the following state-listed or state candidate species: Yellow-billed cuckoo; Bald eagle (*Haliaeetus leucocephalus*); Longfin smelt; Coho salmon Southern Oregon/Northern California Coast ESU; Steelhead Northern California DPS; McDonald’s rockcress; and Western bumble bee (*Bombus occidentalis*).

Invasive Species

Potential effects of the project that may affect special-status species, by promoting the spread of invasive species, would include native animal stressors such as noise and visual disturbance, native vegetation removal, and invasive plant propagule transmission related to equipment and personnel access.

To prevent the spread of invasive animal species, including barred owl, project activities would occur between September 16 and January 31, avoiding the entirety or peak breeding seasons (when animals are most vulnerable to disturbance) of special-status animal species within the ESL. Vegetation removal within native plant and animal species’ habitat, and noise and visual disturbances to animal species, would be limited to the extent necessary to achieve access and conduct geotechnical activities and would be minimal and temporary.

As identified in the project description (Section 1.4.), measures would be implemented as part of the proposed project to ensure invasive species do not proliferate and, therefore, would not result in a substantial adverse effect to special-status species or their habitat.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

As indicated in the Natural Environment Study (NES, Caltrans 2019g), the geotechnical activities would not be anticipated to impact any riparian habitat; however, the activities do have the potential to affect the following SNC: Redwood Forest, Sitka Spruce Forest, Coastal Brambles, and Red Alder Forest.

Potential impacts on SNC are identified in Appendix L and consist of temporary impacts associated with vegetation removal for equipment access, foot paths, seismic surveys, and bore

holes. Impacts were conservatively calculated and include 4-foot-wide footpaths and seismic lines, 50- by 50-feet of disturbance for bore hole locations, and 6-feet-wide grading on existing trails and roads for drill rig access (12-feet for erosional scar at location B-22). It is unlikely that this level of disturbance would be required. Vegetation removal would be limited to the extent necessary to achieve access and conduct geotechnical activities.

Redwood Forest (G3/S3)

- **Late-Seral:** Within the ESL, late-seral redwood forest is located within DNCRSP. Vegetation would be removed for access to and drilling at borehole sites B-28, B-29, and B-30 (A or B) and for footpaths to seismic lines SL 14, SL 16, SL 17, SL 18, and SL 21.

No old-growth redwoods would be affected. At B-30B, clearing of small (<6-inch dbh) redwoods would be necessary. The redwoods at this site would likely re-sprout after cutting. Brushing and ground clearing around boreholes and seismic lines would potentially have temporary impacts on salmonberry, thimbleberry, sword fern, and other native plants that typically grow within the understory in these areas. All these species have the capacity to grow back from the root crown or rhizomes after cutting.

A maximum of approximately 0.35 acre of the 13.45 acres of late-seral redwood forest community within the ESL would be temporarily affected.

- **Secondary:** Within the ESL, secondary redwood forest is located on GDRC land. Vegetation would be removed for access to and drilling at borehole sites B-16, B-36, and B-40 and footpaths to and equipment layout along seismic lines SL 18, SL 21, SL 22, and SL 23.

Primary access to these areas would be along existing logging roads and would require minor vegetation disturbance or removal. Access to B-40 would require road improvements that include brushing of thimbleberry, sword ferns and salal, and removing small trees up to 6-inch dbh. Mature and immature sword fern plants, salal, and thimbleberry would be brushed at other locations. All these species have the capacity to grow back from the root crown or rhizomes after cutting. The small redwoods scoped for removal would likely re-sprout after cutting.

A maximum of approximately 0.30 acre of the 4.35 acres of secondary redwood forest community within the ESL would be temporarily impacted by project activities.

- **Logged:** Within the ESL, logged redwood forest is located on GDRC land. Vegetation would be removed for helicopter bore site B-35 and a footpath to and equipment layout along seismic line SL 20. Brushing and trimming of immature sword ferns, salal, and brambles would be required. All these species have the capacity to grow back from the root crown or rhizomes after cutting. Any small redwoods removed at these sites would likely re-sprout after cutting.

A maximum of approximately 0.10 acre of the 1.44 acres of logged redwood forest community within the ESL would be temporarily impacted by project activities.

Sitka Spruce Forest (G5/S2)

Within the ESL, Sitka spruce forest is located within RNP and DNCRSP. There would be no impacts on this community within DNCRSP. Grading proposed along the Coastal Trail (approximately 200 feet north of B-25) poses a potential for minor impacts on Sitka spruce forest in this area; however, the roots of the spruce trees would be avoided during grading. Brushing, limbing, or removal of alders, and grading would be required for geotechnical vehicles and the drill rig to access B-25. No impacts on Sitka spruce trees are expected. Minimal impacts on undergrowth, such as sword ferns, are anticipated.

A maximum of approximately 0.01 acre of the 0.65 acre of Sitka spruce forest community within the ESL would be temporarily impacted by project activities within RNP.

Coastal Brambles (G4/S3)

Within the ESL, coastal brambles are located within DNCRSP and RNP, and on GDRC land. Vegetation would be removed for access to and drilling at borehole sites B-25, B-28, B-29, B-30A, and B-34A and footpaths to and equipment layout along seismic lines SL 11, SL 12, SL 14, SL 15, and SL 23. Additionally, a small amount of brushing and/or grading would be required for access to B-40.

Vegetation that would typically be cleared or brushed includes salmonberry, thimbleberry, cascara, and red elderberry, all of which have the capacity to grow back from the root crown or rhizomes after cutting. Therefore, investigation activities within coastal brambles along these seismic lines are expected to be minor and temporary.

A maximum of approximately 0.25 acre of the 3.54 acres of the coastal bramble community within the ESL would be temporarily impacted by project activities.

Red Alder Forest (G5/S4)

Within the ESL, red alder forest is located within DNCRSP and RNP. Vegetation would be removed for access to and drilling at borehole sites B-19, B-20, B-22, B-26, B-34B and footpaths to and equipment layout along seismic lines SL 9, SL 10, SL 11, SL 12, SL 13, SL 15, SL 19, and SL 23. Additionally, brushing and grading would be required for vehicle access to B-22 and along the Coastal Trail.

To provide access for the rubber track drill rig, brushing and grading, and removal of one or two red alders and at least one large, approximately 3-foot diameter sword fern is anticipated along portions of the road and trail within red alder forest. To provide helicopter access for bore hole B-34B, removal of an approximately 30-inch dbh alder tree and cutting of limbs along one side of an approximately 18-inch dbh redwood are anticipated.

To access borehole site B-22, an approximately 400-foot-long by 12-feet-wide access road would be needed, which would require heavy grading and the filling of an erosional scar (an abandoned road) that is up to 15-foot-deep. Grading would likely require the removal of salmonberry, thimbleberry, sword fern, creambush oceanspray, and other native plants growing within the erosional scar. Post operation, a rock dissipation structure would be constructed to prevent future erosion. Grading and filling of the erosional scar would remove all vegetation growing within the scar. Given the high cover of similar vegetation adjacent to the erosional scar, it is expected that species such as red alder, salmonberry, thimbleberry, sword fern, and red elderberry would naturally revegetate areas around the rock dissipation structure.

A maximum of approximately 0.58 acre of the 24.07 acres of the red alder forest within the ESL would be temporarily impacted by project activities.

ESHA

There would be no impacts to wetlands, waters or other costal riparian areas; however, during the Coastal Development Permit (CDP) process, Del Norte County might consider occupied special-status wildlife habitat and SNC (e.g., redwood forest, Sitka spruce forest, coastal brambles shrubland, and red alder forest) as ESHAs. Except for grading and filling the erosional scar (abandoned road) that is needed to access B-22, potential effects to these areas would primarily be limited to grading for equipment access along existing trails and roads, and vegetation trimming for foot paths, seismic lines, and boring locations. Removal of one mature alder, branch trimming, and small tree removal would be required for access to bore locations.

Clearing of up to eight 2- by 2-foot areas may be required for each helicopter drill site. Potential effects on these areas would be temporary and minor in nature; therefore, the geotechnical investigation activities would not be anticipated to have a substantial affect to SNC or special-status species' habitats. Please see the discussion on each SNC for specific details on the potential affects to each community.

Invasive Species

The project that may promote the spread of invasive species to riparian habitat or other SNC through native animal stressors such as noise and visual disturbance, native vegetation removal, and invasive plant species propagule transmission related to equipment and personnel access. However, vegetation removal would be temporary and limited to the extent feasible. As identified in the project description (Section 1.4.), measures would be implemented as part of the proposed project to ensure invasive species do not proliferate, including the cleaning of all driven equipment prior to entering the ESL. Therefore, the project would not result in a substantial adverse effect to riparian habitat or SNC or their habitat through the spread of invasive species.

CEQA Question b) Determination

The potential effects on Redwood Forest, Sitka Spruce Forest, Coastal Brambles, Red Alder Forest, and terrestrial special-status wildlife habitat would consist of vegetation trimming, minor tree removal and limbing. As discussed above, most of the species scoped for trimming have the capacity to grow back from the root crown or rhizomes after cutting. The small redwoods that would be removed would likely re-sprout after cutting, as their stumps would remain intact. The effects on these communities would be temporary and, as described by the measures in Section 1.4., all affected areas would be fully restored. Given this, a "Less Than Significant Impact" determination was made for this question.

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

As indicated in the NES (Caltrans 2019g), wetlands and waters of the U.S. and state, and coastal jurisdictional features regulated by the California Coastal Commission (CCC), would not be affected by work activities, therefore no impacts to these resources would be anticipated. Additionally, as identified in the project description (Section 1.4.), measures would be implemented as part of the proposed project to ensure invasive species do not affect these or the surrounding areas. Given this, a "No Impact" determination was made for this question.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

As discussed in the project description, the NES (Caltrans 2019g), and in question b above, potential impacts on animal habitat would be habitat modification caused by vegetation removal and noise and visual disturbance. Temporary vegetation impacts were conservatively calculated and include 4-foot-wide footpaths and seismic lines, 50- by 50-feet of disturbance for bore hole locations, and 6-foot-wide for grading locations on drill-rig access roads (12-feet for erosional scar at location B-22). It is unlikely that this level of disturbance would be required. Vegetation removal would be limited to the extent necessary to achieve access and conduct geotechnical activities. Project activities that may cause noise or visual disruption to wildlife are limited in scope and temporary in nature (lasting only 1-2 weeks at each location). No new permanent features that may disrupt wildlife movement would result from project activities.

Due to the limited disturbance, short-term nature of the activities, and the abundance of suitable habitat immediately adjacent to all work locations for all potentially affected species, the geotechnical investigation activities would not be expected to interfere with wildlife connectivity, including the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Given this, a “No Impact” determination was made for this question.

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

The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. Given this, a “No Impact” determination was made for this question.

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

RNP and CSP have several management plans; however, as they are Federal and State owned “Parks”, the missions of both agencies are inherently focused on preservation. GDRC has an Aquatic Habitat Conservation Plan that includes riparian management zones, slope stability measures, forest road management, and harvest related management. GDRC also has a Northern Spotted Owl Habitat Conservation Plan. All potential impacts would be temporary and, as described in the project description (Section 1.4.), all affected areas would be fully restored. As a result, the proposed

geotechnical investigation activities would not be anticipated to conflict with the provisions of any adopted plans. Given this, a “No Impact” determination was made for this question.

Mitigation Measures

Caltrans has determined that impacts to biological resources would have a “Less Than Significant Impact” for CEQA questions a and b, and would have “No Impact” for questions c, d, e, and f. Given this, Caltrans has determined that mitigation would not be required under CEQA. However, per CEQA (14 CCR § 15126.4(a)(3)), mitigation measures may be adopted, but are not required, for environmental impacts that are not found to be significant. During consultation and permitting, regulatory agencies may determine that measures may be needed to offset project impacts to biological resources.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.7. Cultural Resources

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	N/A	N/A	Yes	N/A
Would the project: b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	N/A	N/A	N/A	Yes
Would the project: c) Disturb any human remains, including those interred outside of dedicated cemeteries?	N/A	N/A	N/A	Yes

Regulatory Setting

The term “cultural resources,” as used in this document, refers to the “built environment” (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including “historic properties,” “historic sites,” “historical resources,” and “tribal cultural resources.” Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places (NRHP). Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 Code of Federal Regulations [CFR] 800). The FHWA’s responsibilities under 36 CFR 800 have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 United States Code [USC] 327).

The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on federal or tribal land. The ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the “use” of land from historic properties (in Section 4(f) terminology—historic sites).

CEQA requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as “unique” archaeological resources. California Public Resources Code (PRC) Section 5024.1 established the California Register of Historical Resources (CRHR) and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the CRHR and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 (AB 52) added the term “tribal cultural resources” to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires the Department to inventory state-owned structures in its rights-of-way.

Environmental Setting

The project is located in northwest California within a mountainous region comprising elongated ranges and valleys that trend in a northwesterly direction. Characterized by a coastal Mediterranean environment, temperatures typically range between 41 and 67°F. The region experiences high average winter precipitation, which can reach 100 inches per year. The low-lying coastal areas receive some of this precipitation in fog drip, which is frequent during the summers. Winter snow accumulations are generally sparse and confined to the region’s higher elevations. Named streams close to the project area include Wilson Creek just south of the project area, and Damnation Creek north of the project, both draining into the Pacific Ocean.

The combination of high rainfall, geology, and topographic diversity has yielded a variety of important subsistence resources, including fish, wildlife, and edible plants. Archaeological records indicate Native Americans have inhabited the area for upwards of 8000 years. Unlike other parts of California, the contact period between European settlers and Native Americans took place relatively late in northwestern California (late 1700’s to early 1800’s). Various historic-era cultural resources have been

documented within the project area and include a wagon road, the Old Redwood Highway, and the DeMartin Homestead.

Discussion of Environmental Evaluation Question 2.7—Cultural Resources

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

Caltrans initiated consultation with the State Historic Preservation Officer (SHPO) for the project on October 14, 2019. Three cultural resources, all state-owned resources pursuant to PRC Section 5024, have been identified within the Area of Potential Effect (APE) (Historic Property Survey Report [HPSR], Caltrans 2019e):

- 1) *1930's Alignment of the Old Redwood Highway (modern U.S. 101; PM 13.3/22.58)*: This resource was previously determined as not eligible for inclusion in the NRHP and/or the California Register of Historic Resources (CRHR) with SHPO concurrence on May 14, 2014, (see Appendix E) and those determinations remain valid. Given this, work may occur within this resource without need for further documentation.
- 2) *Road Grade and Drainage Ditch*: Caltrans has determined this resource is not eligible for inclusion in the NRHP and/or the CRHR, and is not a California Historical Landmark. Caltrans received SHPO concurrence in this determination on November 5, 2019 (see Appendix E). Given this, work may occur within this resource without need for further documentation.
- 3) *1884 Crescent City to Trinidad Wagon Road*: Per SHPO's recommendation, Caltrans is treating this resource as eligible for inclusion in the NRHP and the CRHR for the purposes of the project only (see Appendix E). Caltrans identified seven segments of the wagon road within the project's APE. Six of the seven segments in the APE lack historical integrity and would not be contributing elements to the wagon road's significance if the road was determined eligible in the future. The remaining segment identified in the APE, Segment 1, retains historic integrity and would be considered a contributing element to the resource's eligibility. Seismic refraction surveys would occur adjacent to segment but no direct ground disturbance would occur within the road or its adjacent cut slopes.

Although the 1884 Crescent City to Trinidad Wagon Road is within the APE, all segments retaining historical integrity would be avoided during the geotechnical investigation activities. Therefore, a “Less Than Significant Impact” determination was made for this question.

Caltrans anticipates a Finding of No Adverse Effect is appropriate for this undertaking and is seeking the SHPO’s concurrence on this finding.

b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*

As indicated in the Historic Property Survey Report (Caltrans 2019e), no archaeological deposits or artifacts were identified within the APE. Given this, a “No Impact” determination was made for this question.

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

Human remains have not been identified within APE (HPSR, Caltrans 2019e). Given this, a “No Impact” determination was made for this question.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.8. Energy

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	N/A	N/A	N/A	Yes
Would the project: b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project, as well as the project’s analysis on energy (Caltrans 2019c). Transportation energy is generally described in terms of direct and indirect energy. For direct energy, the geotechnical investigation would not increase capacity or provide congestion relief when compared to the no-investigation alternative. As such, it is unlikely to increase direct energy consumption through increased fuel usage.

For indirect energy, the geotechnical investigation would not result in maintenance activities which would result in long-term indirect energy consumption; thus, it is not anticipated to increase indirect energy consumption through increased fuel usage. Moreover, construction-related energy consumption would be temporary and not a permanent new source of energy demand. Therefore, the project would not result in an inefficient, wasteful, and unnecessary consumption of energy.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.9. Geology and Soils

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	No	No	No	Yes
Would the project: a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: ii) Strong seismic ground shaking?	No	No	No	Yes
Would the project: a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: iii) Seismic-related ground failure, including liquefaction?	No	No	No	Yes
Would the project: a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: iv) Landslides?	No	No	No	Yes
Would the project: b) Result in substantial soil erosion or the loss of topsoil?	No	No	No	Yes
Would the project: c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	No	No	No	Yes

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	No	No	No	Yes
Would the project: e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	No	No	No	Yes
Would the project: f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	No	No	No	Yes

The “No Impact” determinations for geology and soils made in this section are based on the scope, description, and location of the proposed project, and on the Paleontological Identification Report prepared for the project (Caltrans 2019h).

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.10. Greenhouse Gas Emissions

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	N/A	N/A	Yes	N/A
Would the project: b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	N/A	N/A	Yes	N/A

Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), and various hydrofluorocarbons (HFCs). CO₂ is the most abundant GHG; while it is a naturally occurring component of Earth's atmosphere, fossil-fuel combustion is the main source of additional, human-generated CO₂.

Two terms are typically used when discussing how we address the impacts of climate change: "greenhouse gas mitigation" and "adaptation." Greenhouse gas mitigation covers the activities and policies aimed at reducing GHG emissions to limit or "mitigate" the impacts of climate change. Adaptation, on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels). This analysis will include a discussion of both.

Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce greenhouse gas emissions from transportation sources.

FEDERAL

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

The National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The Federal Highway Administration (FHWA) recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices (FHWA 2019). This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—“the triple bottom line of sustainability” (FHWA no date). Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects. The most important of these was the Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Economy (CAFE) Standards. This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the CAFE program on the basis of each manufacturer’s average fuel economy for the portion of its vehicles produced for sale in the United States.

Energy Policy Act of 2005, 109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) the establishment of the Office of Indian Energy Policy and Programs within the Department of Energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8)

hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

The U.S. EPA⁶, in conjunction with the National Highway Traffic Safety Administration (NHTSA), is responsible for setting GHG emission standards for new cars and light-duty vehicles to significantly increase the fuel economy of all new passenger cars and light trucks sold in the United States. The current standards require vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. EPA and NHTSA are currently considering appropriate mileage and GHG emissions standards for 2022–2025 light-duty vehicles for future rulemaking.

NHTSA and EPA issued a Final Rule for “Phase 2” for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO₂ emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

STATE

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and executive orders (EOs) including, but not limited to, the following:

EO S-3-05 (June 1, 2005): The goal of this EO is to reduce California’s GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill (AB) 32 in 2006 and Senate Bill (SB) 32 in 2016.

AB 32, Chapter 488, 2006, Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals outlined in EO S-3-05, while further mandating that the California Air Resources Board (ARB) create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions

⁶ U.S. EPA’s authority to regulate GHG emissions stems from the U.S. Supreme Court decision in Massachusetts v. EPA (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and U.S. EPA’s assessment of the scientific evidence that form the basis for U.S. EPA’s regulatory actions (U.S. EPA 2009).

in emissions of GHGs beyond 2020 (Health and Safety Code [H&SC] Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

EO S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

SB 375, Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

SB 391, Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to identify strategies to address California's climate change goals under AB 32.

EO B-16-12 (March 2012): Orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

EO B-30-15 (April 2015): Establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMTCO₂e).⁷ Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

⁷ GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO₂ is the most important GHG, so amounts of other gases are expressed relative to CO₂, using a metric called "carbon dioxide equivalent" (CO₂e). The GWP of CO₂ is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO₂.

SB 32, Chapter 249, 2016: Codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

SB 1386, Chapter 545, 2016: Declared “it to be the policy of the state that the protection and management of natural and working lands ... is an important strategy in meeting the state’s greenhouse gas reduction goals, and would require all state agencies, departments, boards, and commissions to consider this policy when revising, adopting, or establishing policies, regulations, expenditures, or grant criteria relating to the protection and management of natural and working lands.”

AB 134, Chapter 254, 2017: Allocates Greenhouse Gas Reduction Funds and other sources to various clean vehicle programs, demonstration/pilot projects, clean vehicle rebates and projects, and other emissions-reduction programs statewide.

SB 743, Chapter 386 (September 2013): This bill changes the metric of consideration for transportation impacts pursuant to CEQA from a focus on automobile delay to alternative methods focused on vehicle miles traveled, to promote the state’s goals of reducing greenhouse gas emissions and traffic-related air pollution, and promoting multimodal transportation while balancing the needs of congestion management and safety.

SB 150, Chapter 150, 2017, Regional Transportation Plans: This bill requires ARB to prepare a report that assesses progress made by each Metropolitan Planning Organization in meeting their established regional greenhouse gas emission reduction targets.

EO B-55-18, (September 2018): sets a new statewide goal to achieve and maintain carbon neutrality no later than 2045. This goal is in addition to existing statewide targets of reducing GHG emissions.

Environmental Setting

The project is located in a rural part of Del Norte County along the northern California coast. Traffic counts are low on this segment of U.S. 101, and the highway is rarely congested. Project activities would take place within RNP, DNCRSP, and private GDRC land. The Del Norte Local Transportation Commission Regional Transportation Plan (RTP) guides transportation development in the project area. The proposed geotechnical investigation project does not involve changes to the roadway infrastructure and activities would take place primarily off the highway.

A GHG emissions inventory estimates the amount of GHGs discharged into the atmosphere by specific sources over a period of time, such as a calendar year. Tracking annual GHG emissions allows countries, states, and smaller jurisdictions to understand how emissions are changing and what actions may be needed to attain emission reduction goals. U.S. EPA is responsible for documenting GHG emissions nationwide, and the ARB does so for the state, as required by California Health & Safety Code (H&SC) Section 39607.4.

National GHG Inventory

The U.S. EPA prepares a national GHG inventory every year and submits it to the United Nations in accordance with the Framework Convention on Climate Change (see Figure 7). The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO₂, CH₄, N₂O, HFCs, perfluorocarbons, SF₆, and nitrogen trifluoride. It also accounts for emissions of CO₂ that are removed from the atmosphere by “sinks” such as forests, vegetation, and soils that uptake and store CO₂ (carbon sequestration). The 1990–2016 inventory found that of 6,511 MMTCO₂e GHG emissions in 2016, 81% consist of CO₂, 10% are CH₄, and 6% are N₂O; the balance consists of fluorinated gases (U.S. EPA 2018). In 2016, GHG emissions from the transportation sector accounted for nearly 28.5% of U.S. GHG emissions.

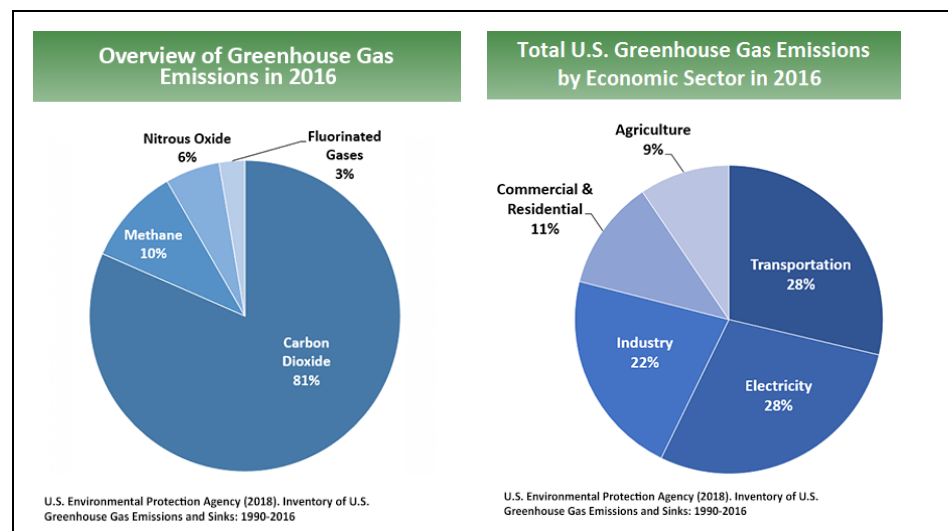


Figure 7. U.S. 2016 Greenhouse Gas Emissions

State GHG Inventory

ARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year (see Figure 8). It then summarizes and highlights major annual changes and trends to demonstrate the state's progress in meeting its GHG reduction goals. The 2019 edition of the GHG emissions inventory found total California emissions of 424.1 MMTCO₂e for 2017, with the transportation sector responsible for 41% of total GHGs. It also found that overall statewide GHG emissions declined from 2000 to 2017 despite growth in population and state economic output (see Figure 9) (ARB 2019a).

AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020, and to update it every 5 years. ARB adopted the first scoping plan in 2008. The second updated plan, *California's 2017 Climate Change Scoping Plan*, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions.

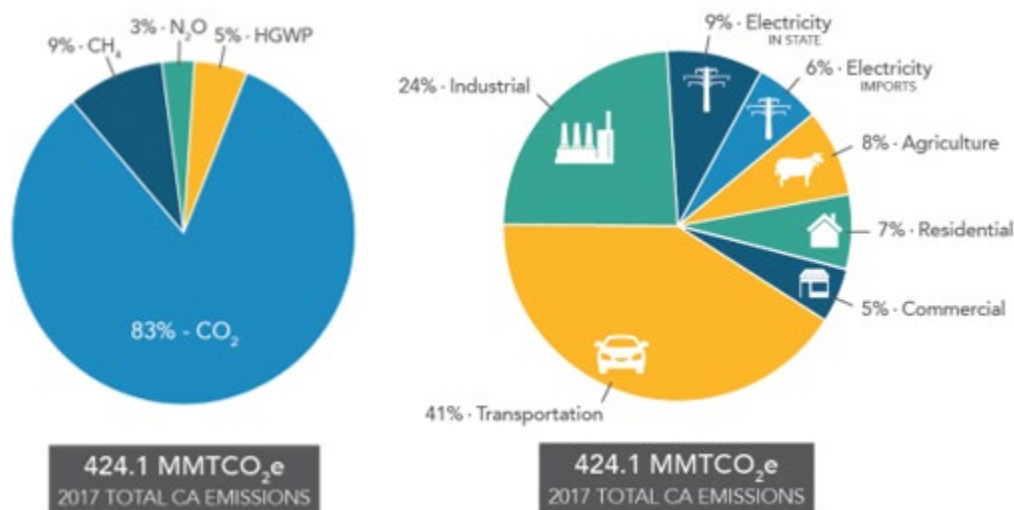


Figure 8. California 2017 GHG Emissions

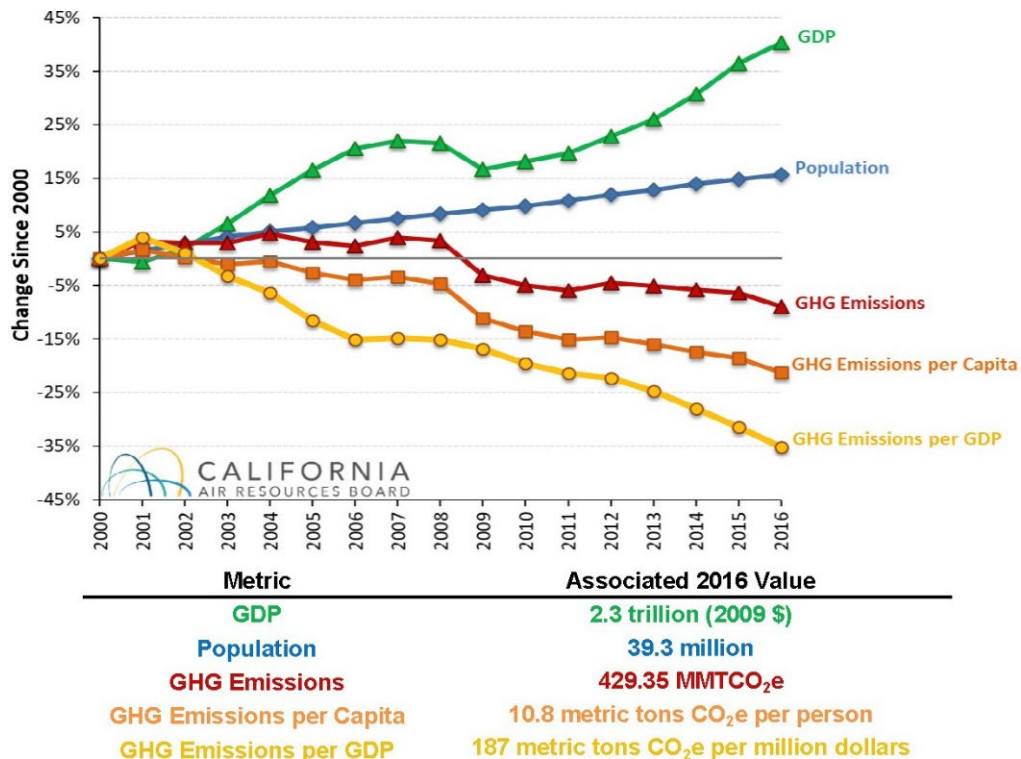


Figure 9. Change in California GDP, Population, and GHG Emissions Since 2000
Source: ARB 2019b

AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020, and to update it every 5 years. ARB adopted the first scoping plan in 2008. The second updated plan, *California's 2017 Climate Change Scoping Plan*, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32. The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions.

Regional Plans

The proposed project is within the jurisdiction of the Del Norte County Local Transportation Commission which is the Regional Transportation Planning Agency for Del Norte County. The Commission is responsible for the development and adoption of the Regional Transportation Plan (RTP) and Transportation Improvement Program as required by state law. The County's 2016 RTP identifies two specific GHG emission goals: ensure sensitivity to the environment in all transportation decisions, and include climate change strategies in transportation investment decisions. According to

the California Climate Adaptation Portal (<https://webmaps.arb.ca.gov/capmap/>), Del Norte County does not currently have a stand-alone Climate Action Plan; however, their 2016 RTP indicates the County relies on the guidance identified in the 2015 Climate Change and Stormwater Management Plan when developing transportation investment strategies.

The policies and goals related to GHG emissions identified in Del Norte County's 2016 RTP are:

- Prioritize and recommend transportation projects that minimize vehicle emissions while providing cost-effective movement of people and goods.
- Promote projects that can be demonstrated to reduce air pollution, such as active transportation projects, transit improvements and alternative fuel programs.
- Meet the standards of the California Clean Air Act and the Federal Clean Air Act and amendments in coordination with the local Air Pollution Control District when developing plans.
- Comply with state and federal climate change regulations and standards.
- Consider GHG emissions as part of every transportation capital improvement project decision.
- Pursue projects with positive GHG impacts that are realistic given the rural nature of Del Norte County, including transit programs, ridesharing programs, bicycle and pedestrian improvements, Intelligent Transportation System (ITS) strategies and maintenance of existing roadways to reduce vehicle emissions.

Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation of the State Highway System (SHS) and those produced during construction. The primary GHGs produced by the transportation sector are CO₂, CH₄, N₂O, and HFCs. CO₂ emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH₄ and N₂O are emitted during fuel combustion. In addition, a small amount of HFC emissions are included in the transportation sector.

The CEQA Guidelines generally address greenhouse gas emissions as a cumulative impact due to the global nature of climate change (Public Resources Code, § 21083(b)(2)). As the California Supreme Court explained, “Because of the global scale of climate change, any one project's contribution is unlikely to be significant by itself.” (Cleveland National Forest Foundation v. San Diego Assn. of Governments (2017) 3 Cal.5th 497, 512.) In assessing cumulative impacts, it must be determined if a project's incremental effect is “cumulatively considerable” (CEQA Guidelines Sections 15064(h)(1) and 15130)).

To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment.

Operational Emissions

The purpose of the proposed project is to conduct a geotechnical investigation and would not increase the vehicle capacity of the roadway. This type of project generally causes minimal or no increase in operational GHG emissions. Because the project would not increase the number of travel lanes on U.S. 101, no increase in vehicle miles traveled (VMT) would occur as result of project implementation. While some GHG emissions during the construction period would be unavoidable, no increase in operational GHG emissions is expected.

Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions would be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

The proposed project is expected to last four months, with an estimated total release of 51 metric tons CO₂. To reduce GHG emissions during geotechnical investigation activities, Caltrans would comply with air pollution control rules, regulations, ordinances, and statutes that apply to the project.

Contractors would be required to comply with all laws applicable to the project and to certify they are aware of and would comply with all ARB emission reduction regulations and with all air pollution control rules, regulations, ordinances, and statutes. Certain common regulations, such as equipment idling restrictions, that reduce construction vehicle emissions also help reduce GHG emissions.

CEQA Conclusion

While the proposed project would result in GHG emissions during construction, it is anticipated the project would not result in any increase in operational GHG emissions. The proposed project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the

emissions of greenhouse gases. With implementation of construction GHG-reduction measures, the impact would be less than significant.

Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

Statewide Efforts

Major sectors of the California economy, including transportation, will need to reduce emissions to meet the 2030 and 2050 GHG emissions targets. Former Governor Edmund G. Brown promoted GHG reduction goals (see Figure 10) that involved (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farms and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, *Safeguarding California*.

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that the state build on past successes in reducing criteria and toxic air pollutants from transportation and goods movement. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled (VMT). A key state goal for reducing greenhouse gas emissions is to reduce today's petroleum use in cars and trucks by up to 50 percent by 2030 (State of California 2019).

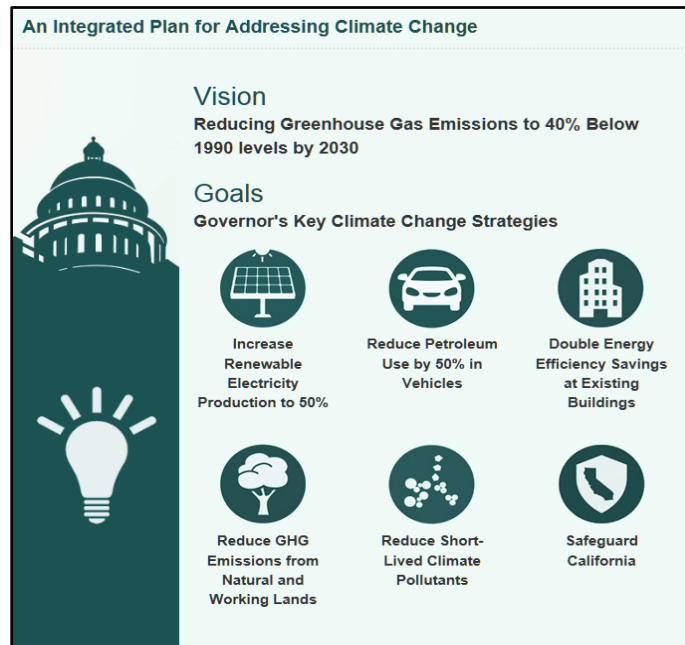


Figure 10. California Climate Strategy

In addition, SB 1386 established as state policy the protection and management of natural and working lands and requires state agencies to consider that policy in their own decision making. Trees and vegetation on forests, rangelands, farms, and wetlands remove carbon dioxide from the atmosphere through biological processes and sequester the carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set an interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

CALIFORNIA TRANSPORTATION PLAN

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. In 2016, Caltrans completed the California Transportation Plan 2040, which establishes a new model for developing ground transportation systems, consistent with CO₂ reduction goals. It serves as an umbrella document for all the other statewide transportation planning documents. Over the next 25 years, California will be working to improve transit and reduce long-run repair and maintenance costs of roadways and developing a

comprehensive assessment of climate-related transportation demand management and new technologies rather than continuing to expand capacity on existing roadways.

SB 391 (Liu 2009) requires the CTP to meet California's climate change goals under AB 32.

Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible greenhouse gas emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce greenhouse gas emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

CALTRANS STRATEGIC MANAGEMENT PLAN

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing VMT
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

FUNDING AND TECHNICAL ASSISTANCE PROGRAMS

In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several sustainable transportation planning grants. These grants encourage local and regional multimodal transportation, housing, and land use planning that furthers the region's RTP/SCS; contribute to the State's GHG reduction targets and advance transportation-related GHG emission reduction project types/strategies; and support other climate adaptation goals (e.g., *Safeguarding California*).

CALTRANS POLICY DIRECTIVES AND OTHER INITIATIVES

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities. *Caltrans Activities to Address Climate Change (April 2013)* provides a comprehensive overview of Caltrans' statewide activities to reduce GHG emissions resulting from agency operations.

PROJECT-LEVEL GREENHOUSE GAS REDUCTION STRATEGIES

The following measures would also be implemented in the project to reduce greenhouse gas emissions and potential climate change impacts from the project:

- Standard construction best management practices for air quality would apply. Such air-pollution control measures can also help reduce construction GHG emissions.
- All areas temporarily disturbed during construction would be revegetated with appropriate native species. Landscaping reduces surface warming and, through photosynthesis, decreases CO₂. This replanting would help offset any potential CO₂ emissions increase.
- Areas of disturbed vegetation would be replanted with regionally appropriate native plants. Plants absorb CO₂ from the atmosphere.
- Pedestrian and bicycle access would be maintained on U.S. 101 during project activities.

Adaptation Strategies

Reducing GHG emissions is only one part of an approach to addressing climate change. Caltrans must plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and in the frequency and intensity of wildfires. Flooding and erosion can damage or wash out roads; longer periods of intense heat can buckle pavement and railroad tracks; storm surges, combined with a rising sea level, can inundate highways. Wildfire can directly burn facilities and indirectly cause damage when rain falls on denuded slopes that landslide after a fire. Effects will vary by location and may, in the most extreme cases, require a facility be relocated or redesigned. Accordingly, Caltrans must consider these types of climate stressors in how highways are planned, designed, built, operated, and maintained.

FEDERAL EFFORTS

Under NEPA assignment, Caltrans is obligated to comply with all applicable federal environmental laws and FHWA NEPA regulations, policies, and guidance.

The U.S. Global Change Research Program (USGCRP) delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 (15 U.S.C. Ch. 56A § 2921 et seq.). The *Fourth National Climate Assessment*, published in 2018, presents the foundational science and the “human welfare, societal, and environmental elements of climate change and variability for 10 regions and 18 national topics, with particular attention paid to observed and projected risks, impacts,

consideration of risk reduction, and implications under different mitigation pathways.” Chapter 12, “Transportation,” presents a key discussion of vulnerability assessments. It notes that “asset owners and operators have increasingly conducted more focused studies of particular assets that consider multiple climate hazards and scenarios in the context of asset-specific information, such as design lifetime” (USGCRP 2018).

U.S. DOT Policy Statement on Climate Adaptation in June 2011 committed the federal Department of Transportation to “integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely, and that transportation infrastructure, services and operations remain effective in current and future climate conditions.” (U.S. DOT 2011).

FHWA Order 5520 (*Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events*, December 15, 2014)⁸ established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. FHWA has developed guidance and tools for transportation planning that foster resilience to climate effects and sustainability at the federal, state, and local levels (FHWA 2019).

STATE EFFORTS

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system. *California’s Fourth Climate Change Assessment* (2018) is the state’s latest effort to “translate the state of climate science into useful information for action” in a variety of sectors at both statewide and local scales. It adopts the following key terms used widely in climate change analysis and policy documents:

- *Adaptation* to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.
- *Adaptive capacity* is the “combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities.”
- *Exposure* is the presence of people, infrastructure, natural systems, and economic, cultural, and social resources in areas that are subject to harm.

⁸ <https://www.fhwa.dot.gov/legregs/directives/orders/5520.cfm>

- Resilience is the “capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience”. Adaptation actions contribute to increasing resilience, which is a desired outcome or state of being.
- *Sensitivity* is the level to which a species, natural system, or community, government, etc., would be affected by changing climate conditions.
- *Vulnerability* is the “susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt.” Vulnerability can increase because of physical (built and environmental), social, political, and/or economic factors. These factors include, but are not limited to, ethnicity, class, sexual orientation and identification, national origin, and income inequality. Vulnerability is often defined as the combination of sensitivity and adaptive capacity as affected by the level of exposure to changing climate.

Several key state policies have guided climate change adaptation efforts to date. Recent state publications produced in response to these policies draw on these definitions.

EO S-13-08, issued by then-governor Arnold Schwarzenegger in November 2008, focused on sea-level rise and resulted in the *California Climate Adaptation Strategy* (2009), updated in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan). The Safeguarding California Plan offers policy principles and recommendations and continues to be revised and augmented with sector-specific adaptation strategies, ongoing actions, and next steps for agencies.

EO S-13-08 also led to the publication of a series of sea-level rise assessment reports and associated guidance and policies. These reports formed the foundation of an interim *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance) in 2010, with instructions for how state agencies could incorporate “sea-level rise (SLR) projections into planning and decision making for projects in California” in a consistent way across agencies. The guidance was revised and augmented in 2013. *Rising Seas in California – An Update on Sea-Level Rise Science* was published in 2017 and its updated projections of sea-level rise and new understanding of processes and potential impacts in California were incorporated into the *State of California Sea-Level Rise Guidance Update* in 2018.

EO B-30-15, signed in April 2015, requires state agencies to factor climate change into all planning and investment decisions. This EO recognizes that effects of climate change other than sea-level rise also threaten California’s infrastructure. At the direction of EO B-30-15, the Office of Planning and Research published *Planning and Investing for a Resilient California: A Guidebook for State Agencies* in 2017 to encourage a uniform and systematic approach. Representatives of Caltrans participated in

the multi-agency, multidisciplinary technical advisory group that developed this guidance on how to integrate climate change into planning and investment.

AB 2800 created the multidisciplinary Climate-Safe Infrastructure Working Group, which in 2018 released its report, *Paying it Forward: The Path Toward Climate-Safe Infrastructure in California*. The report provides guidance to agencies on how to address the challenges of assessing risk in the face of inherent uncertainties still posed by the best available science on climate change. It also examines how state agencies can use infrastructure planning, design, and implementation processes to address the observed and anticipated climate change impacts.

CALTRANS ADAPTATION EFFORTS

Vulnerability Assessments

Caltrans is conducting climate change vulnerability assessments to identify segments of the State Highway System vulnerable to climate change effects including precipitation, temperature, wildfire, storm surge, and sea-level rise. The approach to the vulnerability assessments was tailored to the practices of a transportation agency, and involves the following concepts and actions:

- *Exposure* – Identify Caltrans assets exposed to damage or reduced service life from expected future conditions.
- *Consequence* – Determine what might occur to system assets in terms of loss of use or costs of repair.
- *Prioritization* – Develop a method for making capital programming decisions to address identified risks, including considerations of system use and/or timing of expected exposure.

The climate change data in the assessments were developed in coordination with climate change scientists and experts at federal, state, and regional organizations at the forefront of climate science. The findings of the vulnerability assessments will guide analysis of at-risk assets and development of adaptation plans to reduce the likelihood of damage to the State Highway System, allowing Caltrans to both reduce the costs of storm damage and to provide and maintain transportation that meets the needs of all Californians.

Project Adaptation Analysis

Sea Level Rise

According to the California Coastal Commission Statewide Sea Level Rise Vulnerability Synthesis (2016), due to coastal bluff erosion, the area to the west of the project limits is susceptible to sea-level rise; however, the proposed geotechnical investigation would not add new features that could potentially be affected by coastal erosion.

The proposed project does not conflict with any of the recommendations for sea-level rise planning and adaption approaches identified in the *State of California Sea-Level Rise Guidance 2018 Update*.

Floodplains

According to Federal Emergency Management Agency (FEMA) flood zone maps, the project limits are located in flood Zones D and X. The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. The Zone X designation is used for areas of minimal flood hazard. The specific geotechnical investigation sites are in upland mountainous terrain, which are not likely to experience flooding. Furthermore, the proposed project would be an “investigation”; therefore no permanent features would be built or placed within a potential flood hazard zone.

Wildfire

Based on the fire hazard severity zone maps provided by the California Department of Forestry and Fire Protection (CAL FIRE), no parts of the project are within Very High Fire Hazard Severity Zones in state or local responsibility area lands. Furthermore, the proposed project would not construct any new features or induce uses that would be vulnerable to wildfire or increase risk of wildfire. Drilling contractors would be directed to take precautions against fire.

No Build Alternative

The existing condition would remain; therefore, per CEQA, “No Impact” would occur.

2.11. Hazards and Hazardous Materials

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	N/A	N/A	N/A	Yes
Would the project: b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	N/A	N/A	N/A	Yes
Would the project: c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	N/A	N/A	N/A	Yes
Would the project: d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	N/A	N/A	N/A	Yes
Would the project: e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	N/A	N/A	N/A	Yes
Would the project: f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	N/A	N/A	N/A	Yes
Would the project: g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project, as well as the Initial Site Investigation prepared for this project (Caltrans 2019f). There are no indications of hazardous waste within the project limits and no hazardous waste sites or businesses commonly associated with hazardous waste generation nearby.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.12. Hydrology and Water Quality

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	N/A	N/A	Yes	N/A
Would the project: b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	N/A	N/A	No	Yes
Would the project: c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: (i) result in substantial erosion or siltation on- or off-site;	N/A	N/A	N/A	Yes
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	N/A	N/A	N/A	Yes
(iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	N/A	N/A	N/A	Yes
(iv) impede or redirect flood flows?	N/A	N/A	N/A	Yes
Would the project: d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	N/A	N/A	N/A	Yes
Would the project: e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	N/A	N/A	N/A	Yes

Regulatory Setting

Federal

CLEAN WATER ACT

In 1972, Congress amended the federal Water Pollution Control Act, making the addition of pollutants to waters of the U.S. from any point source⁹ unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of stormwater from municipal and industrial/construction point sources to comply with the NPDES permit program. The following are important CWA sections.

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit who intends to conduct any activity that may result in a discharge to waters of the United States to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the United States. RWQCBs administer this permitting program in California. Section 402(p) requires permits for discharges of stormwater from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by USACE.

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

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

⁹ A *point source* is any discrete conveyance, such as a pipe or a human-made ditch.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard Permits. There are two types of Standard Permits: Individual Permits and Letters of Permission. For Standard Permits, the USACE decision to approve is based on compliance with EPA's Section 404 (b)(1) Guidelines (40 CFR § 230), and whether the permit approval is in the public interest. The Guidelines were developed by EPA, in conjunction with USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the United States) only if no practicable alternative exists that would have less adverse effects. The Guidelines state that USACE may not issue a permit if there is a least environmentally damaging practicable alternative to the proposed discharge that would have lesser effects to waters of the United States and not cause any other significant adverse environmental consequences.

According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent¹⁰ standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the United States. In addition, every permit from the USACE, even if not subject to the Guidelines, must meet general requirements. See 33 CFR Part 320.4.

State

PORTER-COLOGNE WATER QUALITY CONTROL ACT

California's Porter-Cologne Water Quality Control Act (Porter-Cologne Act), enacted in 1969, provides the legal basis for water quality regulation in California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. The act predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the United States, such as groundwater and surface waters not considered waters of the United States. Additionally, the Porter-Cologne Act prohibits discharges of "waste" as defined and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Board and Regional Water Quality Control Boards (RWQCBs) are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and for

¹⁰The EPA defines *effluent* as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, the RWQCBs designate beneficial uses for all water body segments and then set the criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the State Water Board identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and that the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

STATE WATER RESOURCES CONTROL BOARD AND REGIONAL WATER QUALITY CONTROL BOARDS

The State Water Board administers water rights, sets water pollution control policy, issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWQCBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PROGRAM

MUNICIPAL SEPARATE STORM SEWER SYSTEMS

Section 402(p) of the CWA requires issuance of NPDES permits for five categories of stormwater discharges, including MS4s. An MS4 is defined as “any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over stormwater, that is designed or used for collecting or conveying stormwater.” The State Water Board has identified Caltrans as an owner/operator of an MS4 under federal regulations. Caltrans’ MS4 Permit covers all Caltrans rights-of-way, properties, facilities, and activities in the state. The State Water Board or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

Caltrans' MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012, and became effective on July 1, 2013. The permit has three basic requirements.

1. Caltrans must comply with the requirements of the Construction General Permit (see below);
2. Caltrans must implement a year-round program in all parts of the state to effectively control stormwater and non-stormwater discharges; and
3. Caltrans' stormwater discharges must meet water quality standards through implementation of permanent and temporary (construction) BMPs, to the maximum extent practicable, and other measures the State Water Board determines necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the statewide Storm Water Management Plan (SWMP) to address stormwater pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing stormwater management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices Caltrans uses to reduce pollutants in stormwater and non-stormwater discharges. It outlines procedures and responsibilities for protecting water quality, including selection and implementation of BMPs. Further, in recent years, hydromodification control requirements and measures to encourage low impact development have been included as a component of new development permit requirements. The proposed project would be programmed to follow the guidelines and procedures outlined in the latest SWMP to address stormwater runoff.

CONSTRUCTION GENERAL PERMIT

Construction General Permit (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The Construction General Permit was amended by 2010-0014-DWQ and 2012-0006-DWQ on February 14, 2011, and July 17, 2012, respectively. The permit regulates stormwater discharges from construction sites that result in a disturbed soil area (DSA) of 1 acre or greater and/or are smaller sites that are part of a larger common plan of development. By law, all stormwater discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least 1 acre must comply with the provisions of the Construction General Permit. Operators of regulated construction sites are required to develop a Storm Water Pollution Prevention Plan (SWPPP) to implement sediment, erosion, and pollution prevention control measures and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters and whether the receiving water has been designated by the SWRCB as sediment-sensitive. SWPPP requirements vary according to the risk level. For example, a Risk Level 3 (highest risk) project would require compulsory stormwater runoff pH and turbidity monitoring and certain BMPs, and, in some cases, before-construction and after-construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with Caltrans' Standard Specifications, a Water Pollution Control Program rather than a SWPPP is necessary for projects with a DSA of less than 1 acre.

SECTION 401 PERMITTING

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the United States must obtain a 401 Certification, which certifies that the project would be in compliance with state water quality standards. The most common federal permits triggering a 401 Certification are CWA Section 404 permits issued by USACE. The 401 Certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a Section 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Environmental Setting

The project is located in northwest California within a mountainous region comprising elongated ranges and valleys that trend in a northwesterly direction. The region experiences high average winter precipitation, which can reach 100 inches per year. The topography mainly consists of irregular outcrops that are prone to landslides. The dominant soil type in the area is "Group C" which consists mainly of sandy clay loams with low infiltration rates. With the exception of a small portion near the southern project limits which is in the Klamath River Hydrologic Unit, the project is located within the Smith River Hydrologic Unit.

Discussion of Environmental Evaluation Question 2.12—Hydrology and Water Quality

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

The project is exempt from needing a Water Quality Assessment (Caltrans 2019j) as there is no net new impervious surface (NNI), and the potential disturbed soil area (DSA) is less than one acre (approximately 0.83 acre total DSA)—both of which are triggers as defined in the Stormwater General Permit, Caltrans WQ 2015-0036-EXEC (NPDES Permit No. CAS000003) and the Construction General Permit, 2010-0014-DWQ (NPDES Permit No. CAS000002), respectively. The following was considered as part of this determination.

Existing roads and trails: For access purposes, brushing and grading (up to 24-36 inches) would be required at spot locations along existing roads and trails. The roads and trails travel through mountainous terrain that contain nearby wetlands and water courses; however, the grading activities are not anticipated to affect these resources.

Boring Locations: The dimensions of the bore locations would be up to 50 by 50-foot, and, as described below, minor grading and vegetation clearing may be required.

- Locations B-23 and B-24 would be accessed and drilled on existing roads. No vegetation removal or grading is anticipated at these locations.
- Locations B-16, B-19, B-20, B-25, B-26, and B-40 would be accessed from existing roads and trails. Brushing, small tree removal, and light grading would be required at these locations.
- Location B-22 is located approximately 400 feet up an erosional scar. Brushing, small tree removal, and grading would be required at this location. A discussion about the erosional scar is in the following section.
- Locations B-28, B-29, B-30 (A or B), B-34 (A or B), and B-35 would be accessed by helicopter. Brushing and small tree removal would be required at these locations; however, no “grading” would occur. Drilling platforms would be used at these locations, and minor ground disturbance (2 by 2-foot area) would occur at the platform leg locations. Each platform is anticipated to have up to 8 legs.
- Location B-36 occurs in an open clearing. No vegetation removal or grading is anticipated at this location.

The bore locations are within mountainous terrain that contain nearby wetlands and water courses. Activities occurring at these locations (e.g., brushing, grading, and drilling operations) are not anticipated to affect these resources.

Erosional Scar: An abandoned road would be used to access B-22. The purpose of the road and who constructed it is unknown; however, it is not currently maintained, and it appears it has not been used as a road for decades. As a result, the road has developed into an erosional scar that routinely deposits large amounts of sediment. Because the materials are deposited near the highway and require periodic removal by Caltrans maintenance crews, the erosional scar was identified as needing remediation. During a site visit on November 14, 2019, it was confirmed with the USACE that the erosional scar is not a jurisdictional water.

From U.S. 101, the B-22 site is located approximately 400 feet up the erosional scar. For access purposes, the erosional scar would require grading and filling. After the geotechnical activities, an approximate 12 foot by 400 foot rock dissipation structure would be constructed to prevent future erosion. The sediment that the scar routinely delivers has the potential to impact water quality. Given this, the rock dissipation structure would likely be a net benefit for water quality.

Given the scope of the proposed activities and the standard features included as part of the project description, access and other activities associated with the geotechnical investigation are not anticipated to result in any direct or indirect effects on wetlands, water courses, or surface waters. Given this, a “Less Than Significant Impact” determination was made for this question.

Questions b), c), d), and e)

“No Impact” determinations for questions b, c, d, and e are based on the scope, description, and location of the proposed project, and the water quality exemption prepared for the project (Caltrans 2019j). The geotechnical investigation activities would not affect groundwater, alter existing drainage patterns, place or build permanent features within a potential flood hazard zone, or conflict with any water quality control plan or sustainable groundwater management plan.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.13. Land Use and Planning

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Physically divide an established community?	N/A	N/A	N/A	Yes
Would the project: b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to Land Use and Planning are not anticipated as the proposed project would not conflict with the established land use plan or affect conservation planning.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.14. Mineral Resources

Question:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	N/A	N/A	N/A	Yes
Would the project: b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to mineral resources are not anticipated as there are no known mineral resources present.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.15. Noise

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project result in: a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	N/A	N/A	N/A	Yes
Would the project result in: b) Generation of excessive groundborne vibration or groundborne noise levels?	N/A	N/A	N/A	Yes
Would the project result in: c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project, as well as the analyzing noise prepared for this project (Caltrans 2019c). The project meets the criteria for a Type III project as defined in 23 CFR 772. Potential impacts are not anticipated as traffic volumes, composition, and speeds would be same pre and post geotechnical investigations.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.16. Population and Housing

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	N/A	N/A	N/A	Yes
Would the project: b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to population and housing are not anticipated as the project does not involve activities that would directly or indirectly affect population growth or housing.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.17. Public Services

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	N/A	N/A	N/A	Yes
Police protection?	N/A	N/A	N/A	Yes
Schools?	N/A	N/A	N/A	Yes
Parks?	N/A	N/A	N/A	Yes
Other public facilities?	No	No	No	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Impacts to public services are not anticipated as the proposed project does not have the potential to adversely affect public services, including the ability of the Department to operate and maintain the State Highway System.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.18. Recreation

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	N/A	N/A	N/A	Yes
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to Recreation are not anticipated given the geotechnical investigation would not increase the use of the parks and the investigation would not include adding new recreational facilities.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.19. Transportation/Traffic

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	N/A	N/A	N/A	Yes
Would the project: b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? <small>NOTE: While public agencies may immediately apply Section 15064.3 of the updated Guidelines, statewide application is not required until July 1, 2020. In addition, uniform statewide guidance for Caltrans projects is still under development. The PDT may determine the appropriate metric to use to analyze traffic impacts pursuant to section 15064.3(b). Projects for which an NOP will be issued any time after December 28, 2018, should consider including an analysis of VMT/induced demand if the project has the potential to increase VMT (see page 20 of OPR's updated SB 743 Technical Advisory), particularly if the project will be approved after July 2020.</small>	N/A	N/A	N/A	Yes
Would the project: c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	N/A	N/A	N/A	Yes
Would the project: d) Result in inadequate emergency access?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to transportation/traffic are not anticipated as the project would be conducting a geotechnical investigation and would not impact traffic and circulation.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.20. Tribal Cultural Resources

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
<p>Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:</p> <p>a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or</p>	N/A	N/A	N/A	Yes
<p>b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.</p>	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed geotechnical investigation activities. Native American coordination took place through written notifications sent from Caltrans to tribal representatives, and no tribal concerns were expressed. Potential impacts to tribal cultural resources are not anticipated because there are no tribal cultural resources, as defined in Questions a and b, within the project limits that would be affected (Caltrans 2019e).

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.21. Utilities and Service Systems

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Would the project: a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities—the construction or relocation of which could cause significant environmental effects?	N/A	N/A	N/A	Yes
Would the project: b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	N/A	N/A	N/A	Yes
Would the project: c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	N/A	N/A	N/A	Yes
Would the project: d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	N/A	N/A	N/A	Yes
Would the project: e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. Potential impacts to Utilities and Service Systems are not anticipated due to the limited scope of the project and lack of utilities or service systems within the project limits.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.22. Wildfire

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	N/A	N/A	N/A	Yes
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	N/A	N/A	N/A	Yes
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	N/A	N/A	N/A	Yes
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	N/A	N/A	N/A	Yes

“No Impact” determinations in this section are based on the scope, description, and location of the proposed project. The project is located on the northern California coast. The area has a temperate climate, typically consisting of high humidity and high rain totals (average 63 inches per year), resulting in the area experiencing few fires. In addition, the project is not located in areas categorized as Very High Fire Hazard Severity Zones by CAL FIRE in either state or local responsibility areas.

Mitigation Measures

Based on the determinations made in the CEQA Checklist, mitigation measures have not been proposed for the project.

No Build Alternative

The existing condition would remain the same if the geotechnical investigation did not occur; therefore, per CEQA, “No Impact” would occur.

2.23. Mandatory Findings of Significance

Question	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	N/A	N/A	Yes	N/A
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	N/A	N/A	N/A	Yes
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	N/A	N/A	N/A	Yes

Discussion of Environmental Evaluation Question 2.23—Mandatory Findings of Significance

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

The geotechnical investigation would occur in areas where sensitive resources are present; however, due to the limited and temporary scope of the investigation, the analysis indicates the investigation would not have the potential to substantially degrade the quality of the environment or to substantially reduce habitat or species populations to below self-sustaining levels. Based on this, a “Less Than Significant Impact” determination was made for this question.

b) Does the project have impacts that are individually limited, but cumulatively considerable?

Per Section 15130 of CEQA, a Cumulative Impact Analysis (CIA) discussion is only required in “...situations where the cumulative effects are found to be significant.” An Environmental Impact Report (EIR) is required in all situations when a project might result in a “significant” direct, indirect, or cumulative impact on any resource. Due to the limited and temporary scope of the geotechnical investigation, the investigation would not be anticipated to have a cumulative impact on any resource; therefore, an EIR and CIA were not required. Given this, a “No Impact” determination was made for this question.

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

A “No Impact” determination for this question is based on the scope, description, and location of the proposed project. The geotechnical investigation would occur where humans do not reside, and the investigation would not introduce any feature into the environment that has the potential to cause substantial adverse effects on human beings, either directly or indirectly.

2.24. Cumulative Impacts

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this proposed project. A cumulative impact assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time (CEQA, Section 15355).

Cumulative impacts to resources may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

Per Section 15130 of CEQA, a Cumulative Impact Analysis (CIA) discussion is only required in “...situations where the cumulative effects are found to be significant.” An EIR is required in all situations when a project might result in a “significant” direct, indirect, or cumulative impact on any resource. The analysis indicates the activities associated with the geotechnical investigation do not have the potential to have a direct, indirect, or cumulative impact on any resource. Given this, an EIR and CIA were not required for this project.

Chapter 3. Coordination and Comments

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization and/or mitigation measures, and related environmental requirements. Agency consultation and public participation for the project have been accomplished through a variety of formal and informal methods, including Project Development Team (PDT) meetings, interagency coordination meetings, and stakeholder meetings. The following table summarizes Caltrans' efforts to identify, address, and resolve project-related issues through early and continuing coordination.

Coordination Effort	Date	Personnel ¹¹
Cultural Resource Working Group meeting to discuss cultural Programmatic Agreement for LCG	May 22, 2018	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives
LCG Biological Resources Working Group	August 24, 2018	Aida Parkinson, NPS Carol Wilson, CPS Christine Hamilton, Caltrans Biologist Dan Free, NMFS Greg Schmidt, USFWS Jaime Matteoli, Caltrans Project Manager Jason Meyer, Caltrans Environmental Senior Keith Benson, NPS Michael Van Hattem, CDFW Tamara Gedik, CCC
LCG presentation at various tribal meetings	September 5 and 26 and November 29, 2018, and March 13, 2019	Caltrans Representatives Elk Valley Representatives Resighini Representatives Tolowa Dee-ni' Representatives Yurok Tribe Representatives

¹¹CCC=California Coastal Commission, CDFW=California Department of Fish and Wildlife, CDPR=California Department of Parks and Recreation, CPS= California Park Service, EPIC=Environmental Protection Information Center, GDRC=Green Diamond Resource Company, NCRWQCB=North Coast Regional Water Quality Control Board, NMFS=National Marine Fisheries Service, NPS=National Parks Service, USACE=U.S. Army Corps of Engineers, USEPA=U.S. Environmental Protection Agency, USFWS=U.S. Fish and Wildlife Service

Coordination Effort	Date	Personnel ¹¹
LCG Biological Resources Working Group	February 5, 2019	Carol Wilson, CDPR Dan Free, NMFS Denise Walker-Brown, Caltrans Biologist Greg Schmidt, USFWS Jaime Matteoli, Caltrans Project Manager Jason Meyer, Caltrans Environmental Senior Keith Benson, NPS Michael Van Hattem, CDFW Mike Kelly, NMFS
Cultural Resource Working Group meeting to discuss cultural Programmatic Agreement for LCG and project updates	February 8, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives
Circulation of permits for LCG Phase 2B cultural studies	March 15, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives
Conference call to discuss cultural Programmatic Agreement	March 19, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives
MAMU and NSO habitat assessment and helicopter work field review	March 26, 2019	Carol Wilson, CDPR Christine Hamilton, Caltrans Biologist Greg Schmidt, USFWS
Cultural project coordination via email on LCG Phase 2A and 2B	May 7, 2019 to Present	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives

Coordination Effort	Date	Personnel ¹¹
Cultural Resource Working Group meeting to discuss cultural Programmatic Agreement for LCG and LCG geotechnical investigations	June 4, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives
Circulation of the following reports, via e-mail, to the Cultural Resources Working Group: <i>Draft Archaeological Survey Report, Draft Historical Resources Evaluation Report and Draft Sensitivity Assessment/Research Design</i>	June 24, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives Yurok Representatives

Coordination Effort	Date	Personnel ¹¹
LCG stakeholder site visit to GDRC lands	August 8, 2019	Ali Thiel, Caltrans Biologist Amber Transou, CDPR Annie Daly, Office of Jared Huffman Brad Mettam, Caltrans Deputy District Director Brandy Natt, Yurok Tribe Brett Silver, CDPR Carol Wilson, CDPR Charlene Storr, Tolowa Nation Craig Compton, GDRC David Roemer, NPS Eileen Cooper, Friends of Del Norte Gerry Hemmingsen, Del Norte County Gordon Johnson, Humboldt County Association of Governments Greg Schmidt, USFWS Jaime Matteoli, Caltrans Project Manager John Driscoll, Office of Jared Huffman Keith Slausen, CDPR Kellie Eldridge, Caltrans Env. Coordinator Kurt Stremberg, LCG Stakeholder Group Laura Lalemand, Save the Redwoods League Leonel Arguello, NPS Logan Feree, Congressman Huffman's Office Lori Cowan, Del Norte County Matt Smith, Caltrans Design Matt Wakefield, Del Norte County Mike Kelly, NMFS Sabina Renner, Renner Petroleum Sebastian Cohen, Caltrans Construction Shannon Dempsey, CDPR Steve Croteau, Caltrans Environmental Senior Susan Stewart, NCRWQCB Tom Wheeler, EPIC Victor Bjelajac, CDPR
Coordination for Section 7 effects determination for NSO, MAMU, Humboldt marten, and West Coast DPS of fisher.	August 15, 2019	Ali Thiel, Caltrans Biologist Greg Schmidt, USFWS

Coordination Effort	Date	Personnel ¹¹
LCG Biological Resources Working Group	August 27, 2019	Ali Thiel, Caltrans Biologist Brandon Larsen, Caltrans Env. Office Chief Carol Wilson, CDPR Carolyn Mulvihill, USEPA Christine Hamilton, Caltrans Biologist Dan Free, NMFS Greg Schmidt, USFWS Jaime Matteoli, Caltrans Project Manager Jamie Jackson, CDFW Jason Meyer, Caltrans Environmental Senior Keith Benson, NPS Mike Kelly, NMFS Steve Croteau, Caltrans Environmental Senior Tamara Gedik, CCC
LCG Stakeholder Meeting	September 11, 2018	Brett Silver, CDPR Charlie Narwold, Caltrans Geotech Services Ciara Emery, Office of Jared Huffman Cindy Vosburg, Crescent City/Del Norte County Craig Compton, GDRRC David Roemer, NPS Eileen Cooper, Friends of Del Norte Gerry Hemmingsen, DN County Gordon Johnson, Humboldt County Association of Governments Jaimie Matteoli, Caltrans Project Manager Jason Greenough, Crescent City John Driscoll, Office of Jared Huffman Joy Keller-Weidman, US Institute for Environmental Conflict Resolution Karen Sanders, Caltrans Resident Engineer Laura Lalemand, Save the Redwoods League Lori Cowan, Del Norte County Matt Smith, Caltrans Design Steve Croteau, Caltrans Environmental Senior Steve Madrone, Humboldt County Tim Keefe, Caltrans Environmental Senior Tom Wheeler, EPIC Victor Bjelajac, CDPR
Circulation of the following report to the Cultural Resources Working Group: <i>Historic Property Survey Report</i>	September 27, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives

Coordination Effort	Date	Personnel ¹¹
Coordination with State Parks for DOT Section 4(f) <i>De Minimis</i> determination	October 14, 2019 through November 5, 2019	Victor Bjelajac, CDPR Carol Wilson, CDPR Amber Transou, CDPR Shannon Dempsey, CDPR Steve Croteau, Caltrans Environmental Senior
Coordination with NPS for DOT Section 4(f) <i>De Minimis</i> determination	October 14, 2019 through November 7, 2019	Steve Mietz, NPS Dave Roemer, NPS Ben Littlefield, NPS Steve Croteau, Caltrans Environmental Senior
Coordination for Section 7 effects determination for NSO and MAMU	October 17, 2019	Greg Schmidt, USFWS Christine Hamilton, Caltrans Biologist
LCG Partnering Meeting	October 24, 2019	Alexis Kelso, Caltrans Environmental Senior Brett Silver, CDPR David Roemer, NPS Jaimie Matteoli, Caltrans Project Manager Joan Chaplick, MIG, Inc. Maria Mayer, MIG, Inc. Steve Croteau, Caltrans Environmental Senior Steve Mietz, NPS Victor Bjelajac, CDPR Zack Chapman, Tolowa Dee-ni' Nation
Clarification of USACE jurisdiction	October 28 and November 11, 2019	Daniel Breen, USACE Rob Meade, Caltrans Senior Agency Liaison
Circulation of the following reports to the Cultural Resources Working Group: <i>Finding of No Adverse Effect and Environmentally Sensitive Area and Monitoring Plan</i>	November 5, 2019	Caltrans Representatives CDPR Representatives Elk Valley Representatives NPS Representatives Resighini Representatives Tolowa Dee-ni' Representatives Tolowa Nation Representatives
Coordination for coastal resources	November 12, 2019	Jaimie Matteoli, Caltrans Project Manager Kellie Eldridge, Caltrans Env. Coordinator Steve Croteau, Caltrans Environmental Senior Taylor Carsley, Del Norte County Planner
USACE jurisdiction site review	November 14, 2019	Keith Hess, USACE Rob Meade, Caltrans Senior Agency Liaison
Coordination for coastal resources	December 2, 2019	Jaimie Matteoli, Caltrans Project Manager Kellie Eldridge, Caltrans Env. Coordinator Steve Croteau, Caltrans Environmental Senior Taylor Carsley, Del Norte County Planner Tamara Gedick, CCC

Chapter 4. List of Preparers

The following individuals performed the environmental work on the project:

Phlora Barbash	Landscape Associate (Aesthetics)
Jeff Barrett	Associate Environmental Planner (Botanist, Revegetation Specialist)
Steve Croteau	Senior Environmental Planner (Environmental Project Manager)
Kellie Eldridge	Associate Environmental Planner (Coordinator)
Christian Figueroa	Engineering Geologist (Paleontology and Hazardous Waste)
Christine Hamilton	Associate Environmental Planner (Biologist)
Tim Keefe	Senior Environmental Planner (Cultural Resources)
Brandon Larsen	Supervising Environmental Planner (Environmental Office Chief)
Jaime Matteoli	Transportation Engineer (Project Manager)
Lorna McFarlane	Associate Environmental Planner (Water Quality)
Robert Meade	Senior Environmental Planner (Resource Specialist)
Karen Radford	Associate Government Program Analyst (Technical Editor)
Matt Smith	Transportation Engineer (Lead Project Engineer)
Ali Thiel	Associate Environmental Planner (Lead Biologist)
Eric Wilson	Engineering Geologist (Geotechnical)
Barbara Wolf	Senior Environmental Planner (Greenhouse Gas)
Saeid Zandian	Transportation Engineer (Air, Noise, GHG, and Energy)
Stacey Zolnoski	Associate Environmental Planner (Archaeologist)



Chapter 5. Distribution List

Federal, State, County and City Organizations

Daniel Alzamora, Federal Highway Administration (FHWA)
Victor Bjelajac, District Superintendent, North Coast Redwoods
Daniel Breen, Senior Regulatory Project Manager, U.S. Army Corps of Engineers
Greg Collins, Cultural Resources Program Manager, North Coast Redwoods District, California State Parks
Karin Grantham, Joint Chief Resource Management and Science, Redwood National Park
Jeff Jahn, Supervisory Fish Biologist, National Marine Fisheries Service
Gordon Johnson, Humboldt County Association of Governments
Mike Kelly, NMFS Caltrans Liaison, National Marine Fisheries Service
Gordon Leppig, Senior Environmental Scientist, California Department of Fish & Wildlife
Steve Mietz, Superintendent, Redwood National Park
Bob Merrill, District Manager, California Coastal Commission
Carolyn Mulvihill, NEPA Reviewer-Transportation, EPA
David Roemer, Deputy Superintendent, Redwood National Park
Greg Schmidt, USFWS Caltrans Liaison, U.S. Fish and Wildlife Service
Susan Stewart, Environmental Scientist, North Coast Regional Water Quality Control Board
Lane Tavaschi, Deputy Harbormaster, Crescent City Harbor Commission
Amber Transou, Senior Environmental Scientist, California State Parks
Michael Van Hattem, Senior Environmental Scientist, California Department of Fish & Wildlife
Lamin Williams, Federal Highway Administration (FHWA)
Carol Wilson, Environmental Scientist, California State Parks

Regional/County/Local Agencies

Taylor Carsley, Planner, Del Norte County Planning

Becky Crockett, Planning Director, Curry County, Oregon

Larry Depee, Lieutenant-Commander, California Highway Patrol

Heidi Kunstal, Director, Community Development Department, Del Norte County

Tamera Leighton, Executive Director, Del Norte County Local Transportation Commission

Tribal Officials

Rosie Clayburn, Tribal Historic Preservation Officer (THPO), Yurok Tribe

Joseph James, Tribal Council Chairman, Yurok Tribe

Kevin Mealue, Tribal Council Member, Elk Valley Rancheria

Dale A. Miller, Tribal Council Chairman, Elk Valley Rancheria

Fawn C. Murphy, Tribal Council Chairperson, Resighini Rancheria

Amanda O'Connell, Tribal Historic Preservation Officer (THPO), Tolowa Dee-ni' Nation

Denise Padgett, Tribal Council Chairperson, Tolowa Dee-ni' Nation

Crista Stewart, Tribal Historic Preservation Officer (THPO), Elk Valley Rancheria

Charlene Storr, Tribal Council Chairperson, Tolowa Nation

Meagan Van Pelt, Executive Director, Resighini Rancheria

Elected Officials

Bob Berkowitz, Supervisor, Del Norte County Board of Supervisors

Lori Cowan, Chair, Del Norte County Board of Supervisors

Peter DeFazio, Oregon Congressman, 4th District

John Driscoll, Congressman Jared Huffman's Office

Erin Dunn, Assembly Member Jim Wood's Office

Roger Gitlin, Supervisor, Del Norte County Board of Supervisors

Jason Greenough, Crescent City Council Member

Gerry Hemmingson, Supervisor, Del Norte County Board of Supervisors

Chris Howard, Supervisor, Del Norte County Board of Supervisors

Jared Huffman, U.S. House of Representatives, District 2

Steve Madrone, Supervisor, Humboldt County Board of Supervisors

Mike McGuire, California State Senator, District 2

Thomas Witzel, Senator Mike McGuire's Office

Jim Wood, Assembly member, California State Assembly, District 2

Interested Groups, Organizations and Individuals

Craig Compton, Green Diamond Resource Company

Eileen Cooper, Friends of Del Norte

Don Gillespie, Friends of Del Norte

Laura Lalemand, Save the Redwoods League

Sabina Renner, C. Renner Petroleum

Gary Smits, Rumiano Cheese

Kurt Stremberg, Last Chance Grade Advisory Committee

Cindy Vosburg, Executive Director, Crescent City Del Norte Chamber of Commerce

Tom Wheeler, Environmental Protection Information Center (EPIC)



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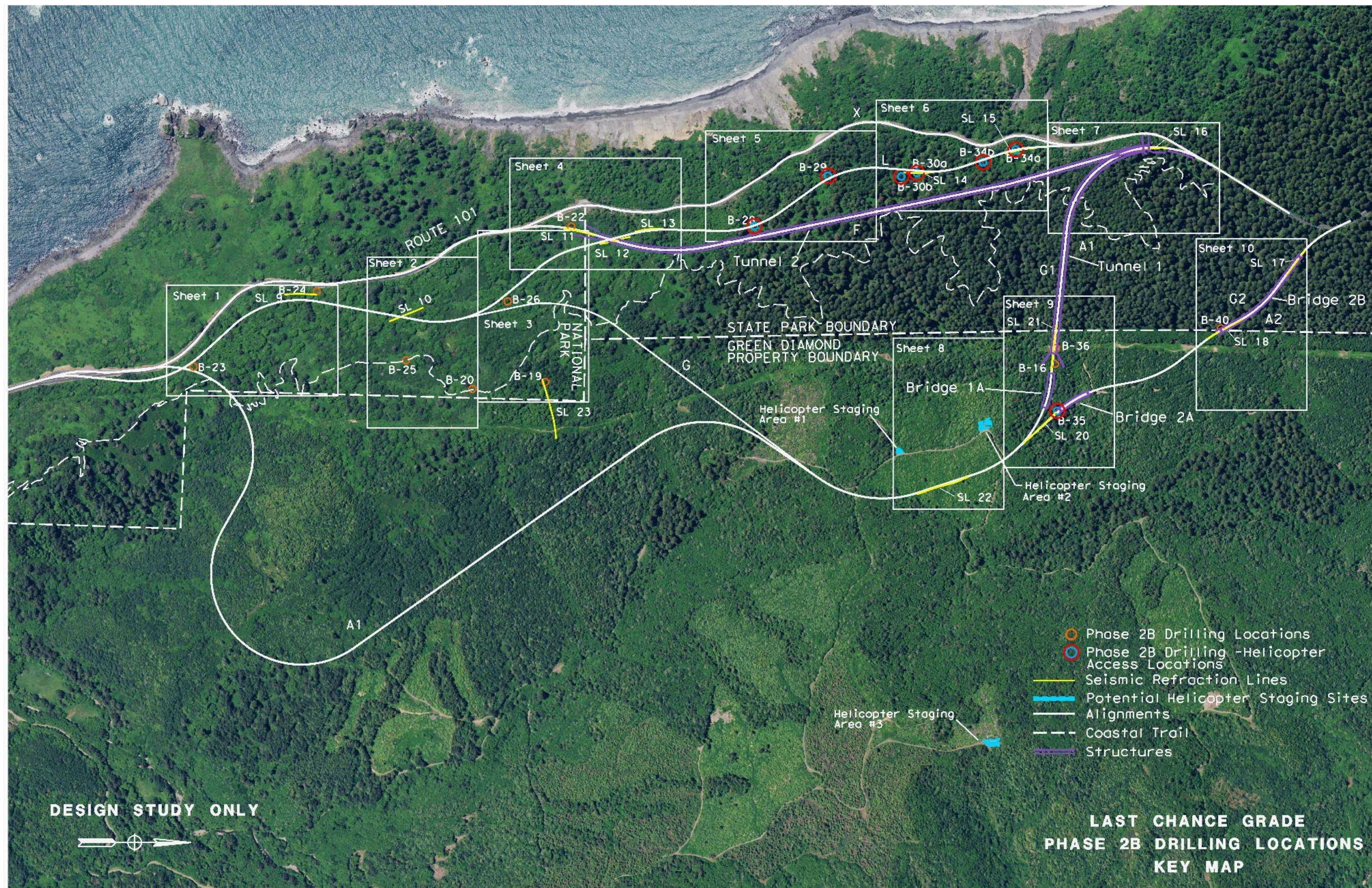
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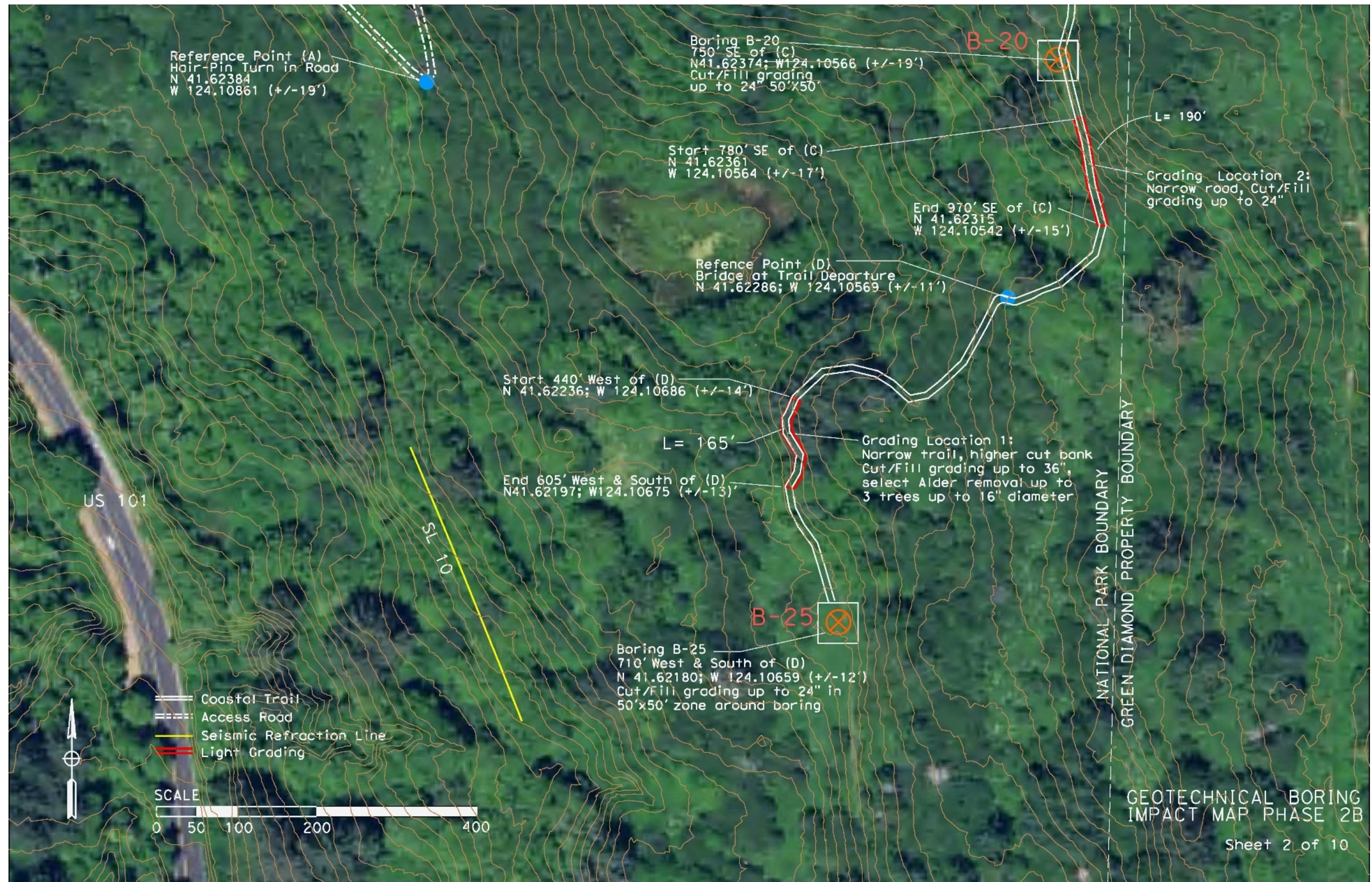


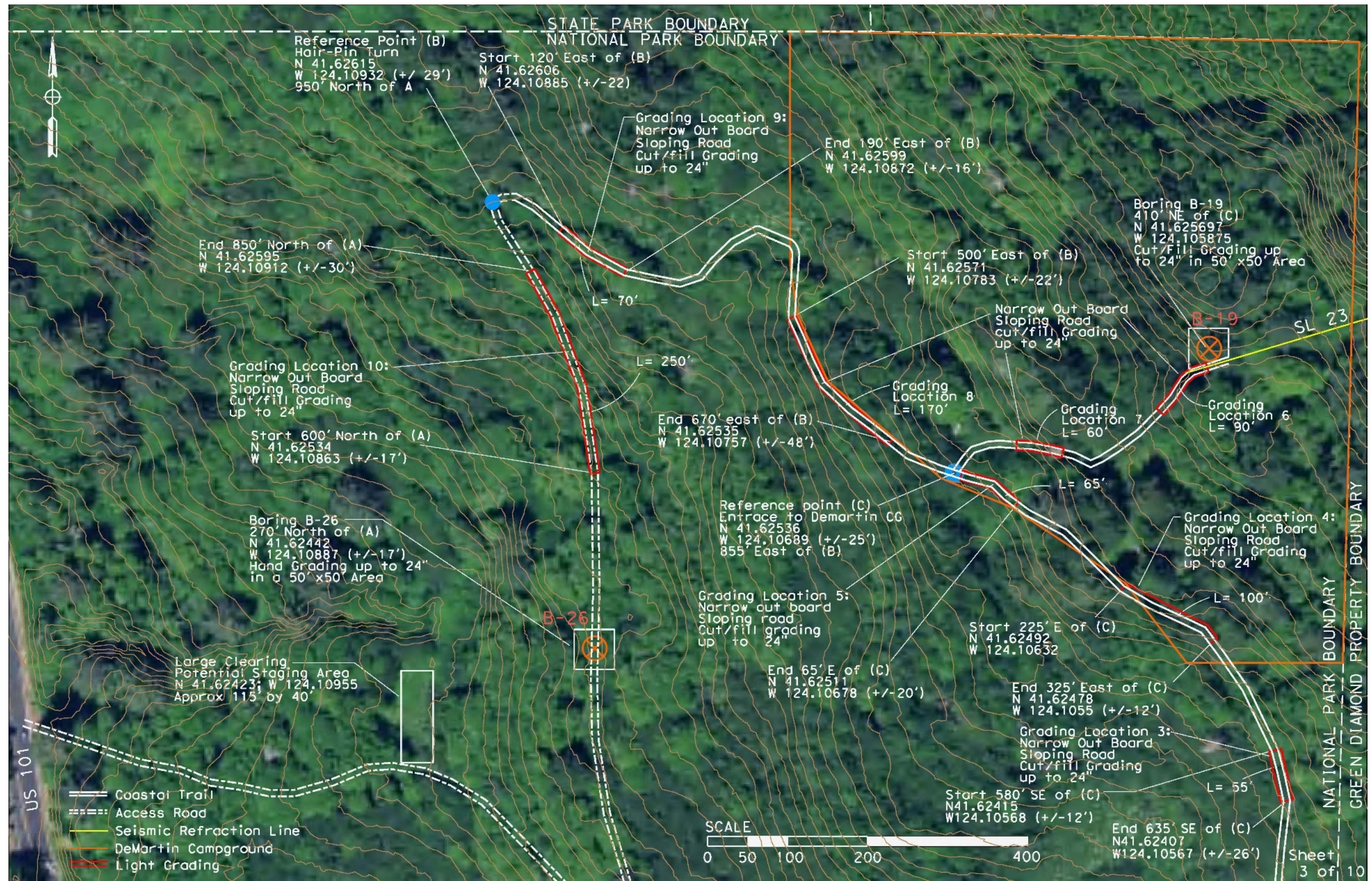
Appendix A. Phase 2B Layouts

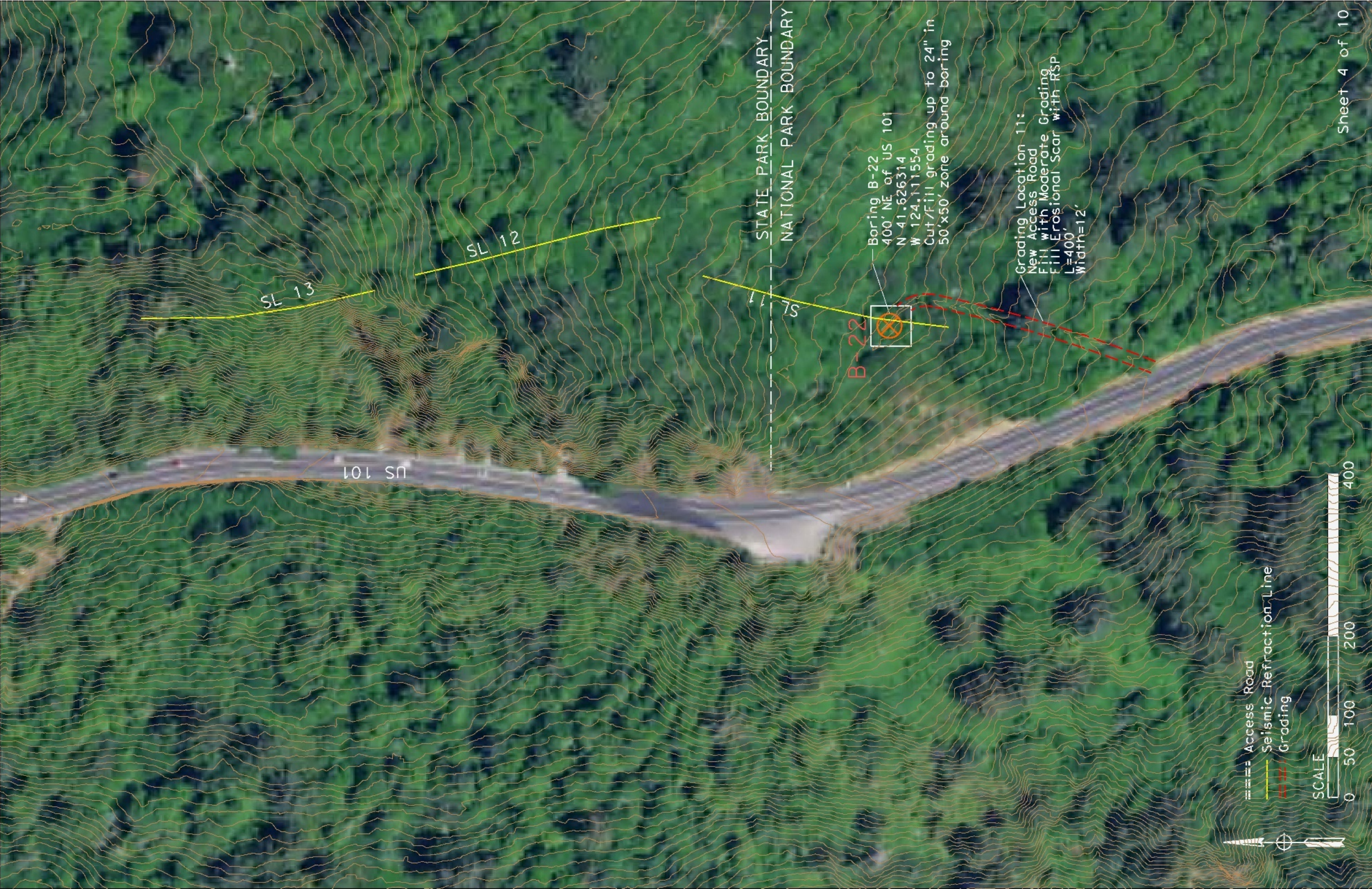










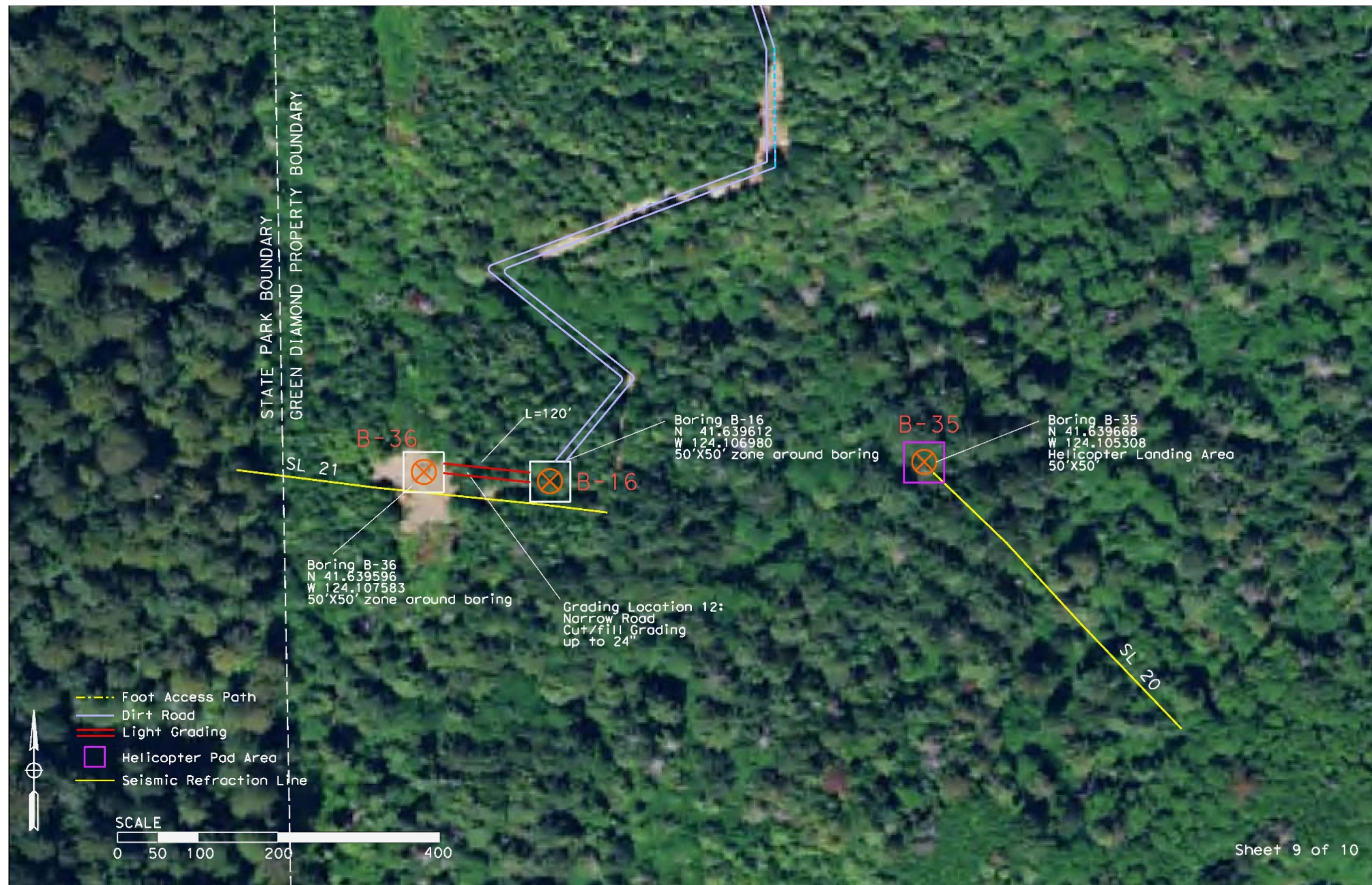














Appendix B. USFWS, NMFS, CNDDB, CNPS and CRPR Species List



NMFS Species List

X = Present on the Quadrangle		ESA ANADROMOUS FISH (E) = Endangered, (T) = Threatened											ESA ANADROMOUS FISH CRITICAL HABITAT												
		COHO		CHINOOK			STEELHEAD					Eulachon (T)	Southern DPS Green Sturgeon (T)	COHO		CHINOOK			STEELHEAD					Eulachon	Southern DPS Green Sturgeon
Quad Name	Quad Number	SONCC (T)	CCC (E)	CC (T)	CVSR (T)	SRWR (E)	NC (T)	CCC (T)	SCCC (T)	SC (E)	CCV (T)			SONCC	CCC	CC	CVSR	SRWR	NC	CCC	SCCC	SC	CCV		
Ah Pah Ridge	41123-D8	X		X			X					X		X										X	
Cant Hook Mount	41123-F8	X												X											
Childs Hill	41124-F1	X										X	X	X											X
Crescent City	41124-G2	X										X	X	X											X
Fern Canyon	41124-D1	X		X			X					X	X	X		X			X						X
Gasquet	41123-G8	X												X											
Hiouchi	41124-G1	X												X											
Klamath Glen	41123-E8	X										X		X										X	
Requa	41124-E1	X		X			X					X	X	X										X	X
Sister Rocks	41124-F2	X										X	X	X											X

X = Present on the Quadrangle		ESA MARINE INVERTEBRATES		ESA MARINE INVERT. CRITICAL HABITAT		ESA SEA TURTLES				ESA WHALES	ESA PINNIPEDS	ESA PINNIPEDS CRITICAL HABITAT	ESSENTIAL FISH HABITAT					MMPA SPECIES	
		Black Abalone (E)	White Abalone (E)	Black Abalone	East Pacific Green Sea Turtle (T)	Olive Ridley Sea Turtle (T/E)	Leatherback Sea Turtle (E)	North Pacific Loggerhead Sea Turtle (E)	Whales (see list below)	Guadalupe Fur Seal (T)	Steller Sea Lion	SALMON		Groundfish	Coastal Pelagic	Highly Migratory Species	MMPA Cetaceans (see "MMPA Species" tab for list)	MMPA Pinnipeds (see "MMPA Species" tab for list)	
												Coho	Chinook						
Quad Name	Quad Number																		
Ah Pah Ridge	41123-D8											X	X	X					
Cant Hook Mount	41123-F8											X	X						
Childs Hill	41124-F1				X	X	X		X			X	X	X	X		X	X	
Crescent City	41124-G2				X	X	X		X			X	X	X	X		X	X	
Fern Canyon	41124-D1				X	X	X		X			X	X	X	X		X	X	
Gasquet	41123-G8											X	X						
Hiouchi	41124-G1											X	X						
Klamath Glen	41123-E8											X	X	X					
Requa	41124-E1				X	X	X		X			X	X	X	X		X	X	
Sister Rocks	41124-F2				X	X	X		X			X	X	X	X		X	X	

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



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:

September 04, 2019

Consultation Code: 08EACT00-2019-SLI-0504

Event Code: 08EACT00-2019-E-01197

Project Name: Last Chance Grade - Geotech Phase 2B

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

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, 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>

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

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

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

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

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

Project Summary

Consultation Code: 08EACT00-2019-SLI-0504

Event Code: 08EACT00-2019-E-01197

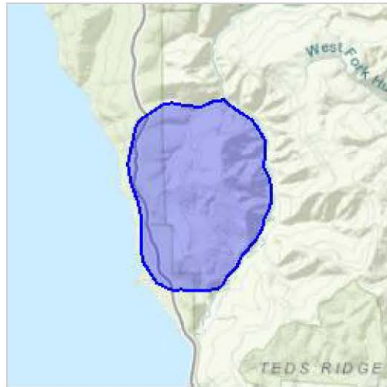
Project Name: Last Chance Grade - Geotech Phase 2B

Project Type: TRANSPORTATION

Project Description: Conduct geotech work to status soils and active landslide

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/41.631928970097135N124.09785426395138W>



Counties: Del Norte, CA

Endangered Species Act Species

There is a total of 8 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 Fisheries¹, 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
Fisher <i>Pekania pennanti</i> Population: West coast DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3651	Proposed Threatened

Birds

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> Population: U.S.A. (CA, OR, WA) There is final critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl <i>Strix occidentalis caurina</i> There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Short-tailed Albatross <i>Phoebastria (=Diomedea) albatrus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover <i>Charadrius nivosus nivosus</i> Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is final critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo <i>Coccyzus americanus</i> Population: Western U.S. DPS There is proposed critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Fishes

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

Flowering Plants

NAME	STATUS
Western Lily <i>Lilium occidentale</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/998	Endangered

Critical habitats

There is 1 critical habitat wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Marbled Murrelet <i>Brachyramphus marmoratus</i> https://ecos.fws.gov/ecp/species/4467#crithab	Final



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad IS (Crescent City (4112472) OR Hiouchi (4112471)
 OR Gasquet (4112378) OR Sister Rocks (4112462)
 OR Childs Hill (4112461) OR Cant Hook Mtn. (4112368)
 OR Requa (4112451) OR Klamath Glen (4112358)
 OR Fern Canyon (4112441) OR Ah Pah Ridge (4112348))
AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects)

Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
AAAAD12050	<i>Plethodon elongatus</i> Del Norte salamander	None	None	G4	S3	WL
AAAAJ01020	<i>Rhyacotriton variegatus</i> southern torrent salamander	None	None	G3G4	S2S3	SSC
AAABA01010	<i>Ascaphus truei</i> Pacific tailed frog	None	None	G4	S3S4	SSC
AAABH01021	<i>Rana aurora</i> northern red-legged frog	None	None	G4	S3	SSC
AAABH01050	<i>Rana boylei</i> foothill yellow-legged frog	None	Candidate Threatened	G3	S3	SSC
ABNDC04010	<i>Oceanodroma furcata</i> fork-tailed storm-petrel	None	None	G5	S1	SSC
ABNFD01020	<i>Phalacrocorax auritus</i> double-crested cormorant	None	None	G5	S4	WL
ABNGA04010	<i>Ardea herodias</i> great blue heron	None	None	G5	S4	
ABNGA11010	<i>Nycticorax nycticorax</i> black-crowned night heron	None	None	G5	S4	
ABNJB05035	<i>Branta hutchinsii leucopareia</i> cackling (=Aleutian Canada) goose	Delisted	None	G5T3	S3	WL
ABNKC01010	<i>Pandion haliaetus</i> osprey	None	None	G5	S4	WL
ABNKC06010	<i>Elanus leucurus</i> white-tailed kite	None	None	G5	S3S4	FP
ABNKC10010	<i>Haliaeetus leucocephalus</i> bald eagle	Delisted	Endangered	G5	S3	FP
ABNKC11011	<i>Circus hudsonius</i> northern harrier	None	None	G5	S3	SSC
ABNLC11010	<i>Bonasa umbellus</i> ruffed grouse	None	None	G5	S3S4	WL
ABNNB03031	<i>Charadrius alexandrinus nivosus</i> western snowy plover	Threatened	None	G3T3	S2S3	SSC
ABNNN06010	<i>Brachyramphus marmoratus</i> marbled murrelet	Threatened	Endangered	G3G4	S1	



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
ABNNN11010	<i>Cerorhinca monocerata</i> rhinoceros auklet	None	None	G5	S3	WL
ABNNN12010	<i>Fratercula cirrhata</i> tufted puffin	None	None	G5	S1S2	SSC
ABNUA01010	<i>Cypseloides niger</i> black swift	None	None	G4	S2	SSC
AFC4E02153	<i>Cottus klamathensis polyporus</i> Lower Klamath marbled sculpin	None	None	G4T2T4	S2S4	SSC
AFCHA0208A	<i>Oncorhynchus clarkii clarkii</i> coast cutthroat trout	None	None	G4T4	S3	SSC
AFCHA0213B	<i>Oncorhynchus mykiss irideus pop. 36</i> summer-run steelhead trout	None	None	G5T4Q	S2	SSC
AFCHB03010	<i>Spirinchus thaleichthys</i> longfin smelt	Candidate	Threatened	G5	S1	
AFCHB04010	<i>Thaleichthys pacificus</i> eulachon	Threatened	None	G5	S3	
AFCQN04010	<i>Eucyclogobius newberryi</i> tidewater goby	Endangered	None	G3	S3	SSC
AMACC01020	<i>Myotis yumanensis</i> Yuma myotis	None	None	G5	S4	
AMACC01070	<i>Myotis evotis</i> long-eared myotis	None	None	G5	S3	
AMACC01090	<i>Myotis thysanodes</i> fringed myotis	None	None	G4	S3	
AMACC02010	<i>Lasionycteris noctivagans</i> silver-haired bat	None	None	G5	S3S4	
AMACC08010	<i>Corynorhinus townsendii</i> Townsend's big-eared bat	None	None	G3G4	S2	SSC
AMAF01017	<i>Aplodontia rufa humboldtiana</i> Humboldt mountain beaver	None	None	G5TNR	SNR	
AMAFF23030	<i>Arborimus pomo</i> Sonoma tree vole	None	None	G3	S3	SSC
AMAFJ01010	<i>Erethizon dorsatum</i> North American porcupine	None	None	G5	S3	
AMAJC03010	<i>Eumetopias jubatus</i> Steller (=northern) sea-lion	Delisted	None	G3	S2	
AMAJF01012	<i>Martes caurina humboldtensis</i> Humboldt marten	None	Endangered	G5T1	S1	SSC
AMAJF01021	<i>Pekania pennanti</i> fisher - West Coast DPS	None	Threatened	G5T2T3Q	S2S3	SSC
ARAAD02030	<i>Emys marmorata</i> western pond turtle	None	None	G3G4	S3	SSC



Selected Elements by Element Code
California Department of Fish and Wildlife
California Natural Diversity Database



Element Code	Species	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
IIHYM24250	<i>Bombus occidentalis</i> western bumble bee	None	None	G2G3	S1	
IIHYM24380	<i>Bombus caliginosus</i> obscure bumble bee	None	None	G4?	S1S2	
IILEP66030	<i>Polites mardon</i> mardon skipper	None	None	G2G3	S1	
IILEPJ6087	<i>Speyeria zerene hippolyta</i> Oregon silverspot butterfly	Threatened	None	G5T1	S1	
IILEPN6035	<i>Coenonympha tullia yontockett</i> Yontockett satyr	None	None	G5T1T2	S1	
IITRI15020	<i>Limnephilus atercus</i> Fort Dick limnephilus caddisfly	None	None	G3G4	S1	
IMBIV27020	<i>Margaritifera falcata</i> western pearlshell	None	None	G4G5	S1S2	
IMGASC7032	<i>Monadenia fidelis pronotis</i> rocky coast Pacific sideband	None	None	G4G5T1	S1	
IMGASK4180	<i>Juga chacei</i> Chace juga	None	None	G1	S1	

Record Count: 47



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad< IS <(Crescent City (4112472)< OR <Hiouchi (4112471)< OR <Gasquet (4112378)< OR <Sister Rocks (4112462)< OR <Childs Hill (4112461)< OR <Cant Hook Mtn. (4112368)< OR <Requa (4112451)< OR <Klamath Glen (4112358)< OR <Fern Canyon (4112441)< OR <Ah Pah Ridge (4112348))< AND <Taxonomic Group< IS <(Dune< OR <Scrub< OR <Herbaceous< OR <Marsh< OR <Riparian< OR <Woodland< OR <Forest< OR <Alpine< OR <Inland Waters< OR <Marine< OR <Estuarine< OR <Riverine< OR <Palustrine< OR <Ferns< OR <Gymnosperms< OR <Monocots< OR <Dicots< OR <Lichens< OR <Bryophytes< OR <Fungi)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Abronia umbellata</i> var. <i>breviflora</i> pink sand-verbena	PDNYC010N4	None	None	G4G5T2	S2	1B.1
<i>Anthoxanthum nitens</i> ssp. <i>nitens</i> vanilla-grass	PMPOA0F041	None	None	G5	S2	2B.3
<i>Arabis mcdonaldiana</i> McDonald's rockcress	PDBRA06150	Endangered	Endangered	G3	S3	1B.1
<i>Asplenium trichomanes</i> ssp. <i>trichomanes</i> maidenhair spleenwort	PPASP021K2	None	None	G5T5	S1	2B.1
<i>Boechera koehleri</i> Koehler's stipitate rockcress	PDBRA060Z0	None	None	G3G4	S3	1B.3
<i>Bryoria spiralis</i> twisted horsehair lichen	NLTEST5460	None	None	G3	S1S2	1B.1
<i>Calamagrostis crassiglumis</i> Thurber's reed grass	PMPOA17070	None	None	G3Q	S2	2B.1
<i>Calamagrostis foliosa</i> leafy reed grass	PMPOA170C0	None	Rare	G3	S3	4.2
<i>Calicium adspersum</i> spiral-spored gilded-head pin lichen	NLT0005640	None	None	G3G4	S1?	2B.2
<i>Calystegia atriplicifolia</i> ssp. <i>buttensis</i> Butte County morning-glory	PDCON04012	None	None	G5T3	S3	4.2
<i>Cardamine angulata</i> seaside bittercress	PDBRA0K010	None	None	G4G5	S3	2B.1
<i>Cardamine nuttallii</i> var. <i>gemmata</i> yellow-tubed toothwort	PDBRA0K0R3	None	None	G5T3Q	S2	3.3
<i>Carex arcta</i> northern clustered sedge	PMCYP030X0	None	None	G5	S1	2B.2
<i>Carex lenticularis</i> var. <i>limnophila</i> lagoon sedge	PMCYP037A7	None	None	G5T5	S1	2B.2
<i>Carex leptalea</i> bristle-stalked sedge	PMCYP037E0	None	None	G5	S1	2B.2
<i>Carex lyngbyei</i> Lyngbye's sedge	PMCYP037Y0	None	None	G5	S3	2B.2



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Carex praticola northern meadow sedge	PMCYP03B20	None	None	G5	S2	2B.2
Carex serpenticola serpentine sedge	PMCYP03KM0	None	None	G4	S3	2B.3
Carex viridula ssp. viridula green yellow sedge	PMCYP03EM5	None	None	G5T5	S2	2B.3
Cascadia nuttallii Nuttall's saxifrage	PDSAX0U160	None	None	G4?	S1	2B.1
Castilleja elata Siskiyou paintbrush	PDSCR0D213	None	None	G3	S2S3	2B.2
Castilleja litoralis Oregon coast paintbrush	PDSCR0D012	None	None	G3	S3	2B.2
Coastal and Valley Freshwater Marsh Coastal and Valley Freshwater Marsh	CTT52410CA	None	None	G3	S2.1	
Coastal Brackish Marsh Coastal Brackish Marsh	CTT52200CA	None	None	G2	S2.1	
Cochlearia groenlandica Greenland cochlearia	PDBRA0S020	None	None	G4	S1	2B.3
Coptis laciniata Oregon goldthread	PDRAN0A020	None	None	G4?	S3?	4.2
Darlingtonia Seep Darlingtonia Seep	CTT51120CA	None	None	G4	S3.2	
Discelium nudum naked flag moss	NBMUS2E010	None	None	G4G5	S1	2B.2
Downingia willamettensis Cascade downingia	PDCAM060E0	None	None	G4	S2	2B.2
Empetrum nigrum black crowberry	PDEMP03020	None	None	G5	S1?	2B.2
Eriogonum nudum var. paralinum Del Norte buckwheat	PDPGN08498	None	None	G5T2	S1	2B.2
Eriogonum pendulum Waldo wild buckwheat	PDPGN084Q0	None	None	G4	S2S3	2B.2
Erysimum concinnum bluff wallflower	PDBRA160E3	None	None	G3	S2	1B.2
Erythronium hendersonii Henderson's fawn lily	PMLIL0U070	None	None	G4	S2	2B.3
Erythronium howellii Howell's fawn lily	PMLIL0U080	None	None	G3G4	S2	1B.3
Erythronium oregonum giant fawn lily	PMLIL0U0C0	None	None	G4G5	S2	2B.2
Erythronium revolutum coast fawn lily	PMLIL0U0F0	None	None	G4G5	S3	2B.2



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Fissidens pauperculus</i> minute pocket moss	NBMUS2W0U0	None	None	G3?	S2	1B.2
<i>Gentiana setigera</i> Mendocino gentian	PDGEN060S0	None	None	G2	S2	1B.2
<i>Gilia capitata</i> ssp. <i>pacifica</i> Pacific gilia	PDPLM040B6	None	None	G5T3	S2	1B.2
<i>Gilia millefoliata</i> dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
<i>Hesperis matronalis</i> var. <i>brevifolia</i> short-leaved evax	PDASTE5011	None	None	G4T3	S2	1B.2
<i>Iliamna latibracteata</i> California globe mallow	PDMAL0K040	None	None	G2G3	S2	1B.2
<i>Kopsiopsis hookeri</i> small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3
<i>Lasthenia californica</i> ssp. <i>macrantha</i> perennial goldfields	PDAST5L0C5	None	None	G3T2	S2	1B.2
<i>Lathyrus japonicus</i> seaside pea	PDFAB250C0	None	None	G5	S2	2B.1
<i>Lathyrus palustris</i> marsh pea	PDFAB250P0	None	None	G5	S2	2B.2
<i>Lewisia oppositifolia</i> opposite-leaved lewisia	PDPOR040B0	None	None	G3	S2	2B.2
<i>Lilium occidentale</i> western lily	PMLIL1A0G0	Endangered	Endangered	G1	S1	1B.1
<i>Lomatium martindalei</i> Coast Range lomatium	PDAP11B140	None	None	G5	S2	2B.3
<i>Lysimachia europaea</i> arctic starflower	PDPRI0A020	None	None	G5	S1	2B.2
<i>Mitella caulescens</i> leafy-stemmed mitrewort	PDSAX0N020	None	None	G5	S4	4.2
<i>Moneses uniflora</i> woodnymph	PDPYR02010	None	None	G5	S2	2B.2
<i>Monotropa uniflora</i> ghost-pipe	PDMON03030	None	None	G5	S2	2B.2
<i>Northern Coastal Salt Marsh</i> Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
<i>Oenothera wolffii</i> Wolf's evening-primrose	PDONA0C1K0	None	None	G2	S1	1B.1
<i>Packera bolanderi</i> var. <i>bolanderi</i> seacoast ragwort	PDAST8H0H1	None	None	G4T4	S2S3	2B.2
<i>Packera hesperia</i> western ragwort	PDAST8H1L0	None	None	G3	S1	2B.2



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Phacelia argentea</i> sand dune phacelia	PDHYD0C070	None	None	G2	S1	1B.1
<i>Pinguicula macroceras</i> horned butterwort	PDLNT01040	None	None	G4	S2	2B.2
<i>Piperia candida</i> white-flowered rein orchid	PMORC1X050	None	None	G3	S3	1B.2
<i>Polemonium carneum</i> Oregon polemonium	PDPLM0E050	None	None	G3G4	S2	2B.2
<i>Potamogeton foliosus ssp. fibrillosus</i> fibrous pondweed	PMPOT030B1	None	None	G5T2T4	S1S2	2B.3
<i>Prosartes parvifolia</i> Siskiyou bells	PMLIL0R014	None	None	G2	S1S2	1B.2
<i>Pyrrocoma racemosa var. congesta</i> Del Norte pyrrocoma	PDASTDT0F4	None	None	G5T4	S2	2B.3
<i>Ramalina thrausta</i> angel's hair lichen	NLLEC3S340	None	None	G5	S2?	2B.1
<i>Romanzoffia tracyi</i> Tracy's romanzoffia	PDHYD0E030	None	None	G4	S2	2B.3
<i>Rosa gymnocarpa var. serpentina</i> Gasquet rose	PDROS1J1V1	None	None	G5T3T4	S2	1B.3
<i>Sabulina howellii</i> Howell's sandwort	PDCAR0G0F0	None	None	G4	S3	1B.3
<i>Sagittaria sanfordii</i> Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
<i>Sanguisorba officinalis</i> great burnet	PDROS1L060	None	None	G5?	S2	2B.2
<i>Sedum citrinum</i> Blue Creek stonecrop	PDCRA0A200	None	None	G2	S2	1B.2
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	PDMAL110E0	None	None	G3	S3	4.2
<i>Sidalcea malviflora ssp. patula</i> Siskiyou checkerbloom	PDMAL110F9	None	None	G5T2	S2	1B.2
<i>Sidalcea oregana ssp. eximia</i> coast checkerbloom	PDMAL110K9	None	None	G5T1	S1	1B.2
<i>Silene scouleri ssp. scouleri</i> Scouler's catchfly	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
<i>Silene serpenticola</i> serpentine catchfly	PDCAR0U2B0	None	None	G3	S3	1B.2
<i>Streptanthus howellii</i> Howell's jewelflower	PDBRA2G0N0	None	None	G2G3	S2	1B.2
<i>Thermopsis robusta</i> robust false lupine	PDFAB3Z0D0	None	None	G2	S2	1B.2



Selected Elements by Scientific Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
<i>Triquetrella californica</i> coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
<i>Usnea longissima</i> Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2
<i>Vaccinium scoparium</i> little-leaved huckleberry	PDERI180Y0	None	None	G5	S3	2B.2
<i>Viola langsdorffii</i> Langsdorf's violet	PDVIO04100	None	None	G4	S1	2B.1
<i>Viola palustris</i> alpine marsh violet	PDVIO041G0	None	None	G5	S1S2	2B.2
<i>Viola primulifolia</i> ssp. <i>occidentalis</i> western white bog violet	PDVIO040Y2	None	None	G5T2	S2	1B.2

Record Count: 85



*The database used to provide updates to the Online Inventory is under construction. [View updates and changes made since May 2019 here.](#)

Plant List

129 matches found. [Click on scientific name for details](#)

Search Criteria

Found in Quads 4112472, 4112471, 4112378, 4112462, 4112461, 4112368, 4112451, 4112358 4112441 and 4112348;

[Modify Search Criteria](#) [Export to Excel](#) [Modify Columns](#) [Modify Sort](#) [Display Photos](#)

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Abronia umbellata var. breviflora	pink sand-verbena	Nyctaginaceae	perennial herb	Jun-Oct	1B.1	S2	G4G5T2
Angelica lucida	sea-watch	Apiaceae	perennial herb	May-Sep	4.2	S3	G5
Antennaria suffrutescens	evergreen everlasting	Asteraceae	perennial stoloniferous herb	Jan-Jul	4.3	S3	G4
Anthoxanthum nitens ssp. nitens	vanilla-grass	Poaceae	perennial rhizomatous herb	Apr-Jul	2B.3	S2	G5
Arabis mcdonaldiana	McDonald's rockcress	Brassicaceae	perennial herb	May-Jul	1B.1	S3	G3
Arctostaphylos hispidula	Howell's manzanita	Ericaceae	perennial evergreen shrub	Mar-Apr	4.2	S3	G4
Arctostaphylos nortensis	Del Norte manzanita	Ericaceae	perennial evergreen shrub	Feb	4.3	S2	G2
Arnica cernua	serpentine arnica	Asteraceae	perennial rhizomatous herb	Apr-Jul	4.3	S4	G5
Arnica spathulata	Klamath amica	Asteraceae	perennial rhizomatous herb	May-Aug	4.3	S3	G3?
Asplenium trichomanes ssp. trichomanes	maidenhair spleenwort	Aspleniaceae	perennial rhizomatous herb	May-Jul	2B.1	S1	G5T5
Boechera koehleri	Koehler's stipitate rockcress	Brassicaceae	perennial herb	(Mar)Apr-Jul	1B.3	S3	G3G4
Bryoria pseudocapillaris	false gray horsehair lichen	Parmeliaceae	fruticose lichen (epiphytic)		3.2	S2	G3
Bryoria spiralifera	twisted horsehair lichen	Parmeliaceae	fruticose lichen (epiphytic)		1B.1	S1S2	G3

<u>Calamagrostis crassiglumis</u>	Thurber's reed grass	Poaceae	perennial rhizomatous herb	May-Aug	2B.1	S2	G3Q
<u>Calamagrostis foliosa</u>	leafy reed grass	Poaceae	perennial herb	May-Sep	4.2	S3	G3
<u>Calicium adspersum</u>	spiral-spored guilded-head pin lichen	Caliciaceae	crustose lichen (epiphytic)		2B.2	S1?	G3G4
<u>Callitropsis nootkatensis</u>	Alaska cedar	Cupressaceae	perennial evergreen tree		4.3	S3	G4G5
<u>Calystegia atriplicifolia ssp. buttensis</u>	Butte County morning-glory	Convolvulaceae	perennial rhizomatous herb	May-Jul	4.2	S3	G5T3
<u>Cardamine angulata</u>	seaside bittercress	Brassicaceae	perennial herb	(Jan)Mar-Jul	2B.2	S3	G4G5
<u>Cardamine nuttallii var. gemmata</u>	yellow-tubered toothwort	Brassicaceae	perennial rhizomatous herb	Apr-May(Jun)	3.3	S2	G5T3Q
<u>Carex arcta</u>	northern clustered sedge	Cyperaceae	perennial herb	Jun-Sep	2B.2	S1	G5
<u>Carex lenticularis var. limnophila</u>	lagoon sedge	Cyperaceae	perennial herb	Jun-Aug	2B.2	S1	G5T5
<u>Carex leptalea</u>	bristle-stalked sedge	Cyperaceae	perennial rhizomatous herb	Mar-Jul	2B.2	S1	G5
<u>Carex lyngbyei</u>	Lyngbye's sedge	Cyperaceae	perennial rhizomatous herb	Apr-Aug	2B.2	S3	G5
<u>Carex praticola</u>	northern meadow sedge	Cyperaceae	perennial herb	May-Jul	2B.2	S2	G5
<u>Carex scabriuscula</u>	Siskiyou sedge	Cyperaceae	perennial rhizomatous herb	May-Jul	4.3	S4	G4G5
<u>Carex serpenticola</u>	serpentine sedge	Cyperaceae	perennial rhizomatous herb	Mar,May	2B.3	S3	G4
<u>Carex viridula ssp. viridula</u>	green yellow sedge	Cyperaceae	perennial herb	(Jun)Jul-Sep(Nov)	2B.3	S2	G5T5
<u>Cascadia nuttallii</u>	Nuttall's saxifrage	Saxifragaceae	perennial rhizomatous herb	May	2B.1	S1	G4?
<u>Castilleja brevilobata</u>	short-lobed paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	Apr-Jul	4.2	S3	G4
<u>Castilleja elata</u>	Siskiyou paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	May-Aug	2B.2	S2S3	G3
<u>Castilleja litoralis</u>	Oregon coast paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	Jun-Jul	2B.2	S3	G3
<u>Chrysosplenium glechomifolium</u>	Pacific golden saxifrage	Saxifragaceae	perennial herb	Feb-Jun(Jul)	4.3	S3	G5?
<u>Cochlearia groenlandica</u>	Greenland cochlearia	Brassicaceae	annual herb	May-Jul	2B.3	S1	G4
<u>Coptis laciniata</u>	Oregon goldthread	Ranunculaceae	perennial rhizomatous herb	(Feb)Mar-May(Sep-Nov)	4.2	S3?	G4?
<u>Cypripedium californicum</u>	California lady's-slipper	Orchidaceae	perennial rhizomatous herb	Apr-Aug(Sep)	4.2	S4	G4
<u>Cypripedium montanum</u>	mountain lady's-slipper	Orchidaceae	perennial rhizomatous herb	Mar-Aug	4.2	S4	G4

<u>Darlingtonia californica</u>	California pitcherplant	Sarraceniaceae	perennial rhizomatous herb (carnivorous)	Apr-Aug	4.2	S4	G4
<u>Dicentra formosa ssp. oregana</u>	Oregon bleeding heart	Papaveraceae	perennial herb	Apr-May	4.2	S3	G5T4
<u>Discelium nudum</u>	naked flag moss	Diseliaceae	ephemeral moss		2B.2	S1	G4G5
<u>Downingia willamettensis</u>	Cascade downingia	Campanulaceae	annual herb	Jun-Jul(Sep)	2B.2	S2	G4
<u>Empetrum nigrum</u>	black crowberry	Empetraceae	perennial evergreen shrub	Apr-Jun	2B.2	S1?	G5
<u>Erigeron bloomeri var. nudatus</u>	Waldo daisy	Asteraceae	perennial herb	Jun-Jul	2B.3	S3	G5T4
<u>Erigeron cervinus</u>	Siskiyou daisy	Asteraceae	perennial rhizomatous herb	Jun-Aug	4.3	S4	G4
<u>Eriogonum nudum var. paralinum</u>	Del Norte buckwheat	Polygonaceae	perennial herb	Jun, Aug, Sep	2B.2	S1	G5T2
<u>Eriogonum pendulum</u>	Waldo wild buckwheat	Polygonaceae	perennial herb	Aug-Sep	2B.2	S2S3	G4
<u>Erysimum concinnum</u>	bluff wallflower	Brassicaceae	annual / perennial herb	Feb-Jul	1B.2	S2	G3
<u>Erythronium hendersonii</u>	Henderson's fawn lily	Liliaceae	perennial bulbiferous herb	Apr-Jul	2B.3	S2	G4
<u>Erythronium howellii</u>	Howell's fawn lily	Liliaceae	perennial bulbiferous herb	Apr-May	1B.3	S2	G3G4
<u>Erythronium oregonum</u>	giant fawn lily	Liliaceae	perennial bulbiferous herb	Mar-Jun(Jul)	2B.2	S2	G4G5
<u>Erythronium revolutum</u>	coast fawn lily	Liliaceae	perennial bulbiferous herb	Mar-Jul(Aug)	2B.2	S3	G4G5
<u>Eucephalus glabratus</u>	Siskiyou aster	Asteraceae	perennial herb	Jul-Sep	4.3	S3	G4
<u>Fissidens pauperculus</u>	minute pocket moss	Fissidentaceae	moss		1B.2	S2	G3?
<u>Gentiana setigera</u>	Mendocino gentian	Gentianaceae	perennial herb	(Apr-Jul) Aug-Sep	1B.2	S2	G2
<u>Gilia capitata ssp. pacifica</u>	Pacific gilia	Polemoniaceae	annual herb	Apr-Aug	1B.2	S2	G5T3
<u>Gilia millefoliata</u>	dark-eyed gilia	Polemoniaceae	annual herb	Apr-Jul	1B.2	S2	G2
<u>Glehnia littoralis ssp. leiocarpa</u>	American glehnia	Apiaceae	perennial herb	May-Aug	4.2	S2S3	G5T5
<u>Hesperevax sparsiflora var. brevifolia</u>	short-leaved evax	Asteraceae	annual herb	Mar-Jun	1B.2	S2	G4T3
<u>Horkelia sericata</u>	Howell's horkelia	Rosaceae	perennial herb	May-Jul	4.3	S3	G4
<u>Hosackia gracilis</u>	harlequin lotus	Fabaceae	perennial rhizomatous herb	Mar-Jul	4.2	S3	G3G4
<u>Iliamna latibracteata</u>	California globe mallow	Malvaceae	perennial herb	Jun-Aug	1B.2	S2	G2G3
<u>Iris bracteata</u>	Siskiyou iris	Iridaceae	perennial rhizomatous herb	May-Jun	3.3	S3	G4G5

<u>Iris innominata</u>	Del Norte County iris	Iridaceae	perennial rhizomatous herb	May-Jun	4.3	S3	G4G5
<u>Iris tenax ssp. klamathensis</u>	Orleans iris	Iridaceae	perennial rhizomatous herb	Apr-May	4.3	S4	G4G5T4
<u>Iris thompsonii</u>	Thompson's iris	Iridaceae	perennial rhizomatous herb	(Mar-Apr)May-Jun(Jul-Aug)	4.3	S3	G3
<u>Kopsiopsis hookeri</u>	small groundcone	Orobanchaceae	perennial rhizomatous herb (parasitic)	Apr-Aug	2B.3	S1S2	G4?
<u>Lasthenia californica ssp. macrantha</u>	perennial goldfields	Asteraceae	perennial herb	Jan-Nov	1B.2	S2	G3T2
<u>Lathyrus delnorticus</u>	Del Norte pea	Fabaceae	perennial herb	Jun-Jul	4.3	S3	G4
<u>Lathyrus japonicus</u>	seaside pea	Fabaceae	perennial rhizomatous herb	May-Aug	2B.1	S2	G5
<u>Lathyrus palustris</u>	marsh pea	Fabaceae	perennial herb	Mar-Aug	2B.2	S2	G5
<u>Layia carnosa</u>	beach layia	Asteraceae	annual herb	Mar-Jul	1B.1	S2	G2
<u>Lewisia oppositifolia</u>	opposite-leaved lewisia	Montiaceae	perennial herb	Apr-May(Jun)	2B.2	S2	G3
<u>Lilium bolanderi</u>	Bolander's lily	Liliaceae	perennial bulbiferous herb	Jun-Jul	4.2	S3S4	G4
<u>Lilium kelloggii</u>	Kellogg's lily	Liliaceae	perennial bulbiferous herb	May-Aug	4.3	S3	G3
<u>Lilium occidentale</u>	western lily	Liliaceae	perennial bulbiferous herb	Jun-Jul	1B.1	S1	G1
<u>Lilium pardalinum ssp. vollmeri</u>	Vollmer's lily	Liliaceae	perennial bulbiferous herb	(Jun)Jul-Aug	4.3	S3	G5T4
<u>Listera cordata</u>	heart-leaved twayblade	Orchidaceae	perennial herb	Feb-Jul	4.2	S4	G5
<u>Lomatium howellii</u>	Howell's lomatium	Apiaceae	perennial herb	Apr-Jul	4.3	S4	G4G5
<u>Lomatium martindalei</u>	Coast Range lomatium	Apiaceae	perennial herb	May-Jun(Aug)	2B.3	S2	G5
<u>Lycopodium clavatum</u>	running-pine	Lycopodiaceae	perennial rhizomatous herb	Jun-Aug(Sep)	4.1	S3	G5
<u>Lysimachia europaea</u>	arctic starflower	Myrsinaceae	perennial herb	Jun-Jul	2B.2	S1	G5
<u>Micranthes marshallii</u>	Marshall's saxifrage	Saxifragaceae	perennial rhizomatous herb	Mar-Aug	4.3	S3	G5
<u>Mitellastra caulescens</u>	leafy-stemmed mitrewort	Saxifragaceae	perennial rhizomatous herb	(Mar)Apr-Oct	4.2	S4	G5
<u>Moneses uniflora</u>	woodnymph	Ericaceae	perennial rhizomatous herb	May-Aug	2B.2	S2	G5
<u>Monotropa uniflora</u>	ghost-pipe	Ericaceae	perennial herb (achlorophyllous)	Jun-Aug(Sep)	2B.2	S2	G5
<u>Oenothera wolfii</u>	Wolf's evening-primrose	Onagraceae	perennial herb	May-Oct	1B.1	S1	G2
<u>Oxalis suksdorfii</u>	Suksdorf's wood-sorrel	Oxalidaceae	perennial rhizomatous herb	May-Aug	4.3	S3	G4
<u>Packera bolanderi var. bolanderi</u>	seacoast ragwort	Asteraceae	perennial rhizomatous herb	(Jan-Apr)May-Jul(Aug)	2B.2	S2S3	G4T4

<u>Packera hesperia</u>	western ragwort	Asteraceae	perennial herb	Apr-Jun	2B.2	S1	G3
<u>Packera macounii</u>	Siskiyou Mountains ragwort	Asteraceae	perennial herb	Jun-Jul	4.3	S3	G5?
<u>Perideridia gairdneri ssp. gairdneri</u>	Gairdner's yampah	Apiaceae	perennial herb	Jun-Oct	4.2	S3S4	G5T3T4
<u>Phacelia argentea</u>	sand dune phacelia	Hydrophyllaceae	perennial herb	Jun-Aug	1B.1	S1	G2
<u>Pinguicula macroceras</u>	horned butterwort	Lentibulariaceae	perennial herb (carnivorous)	Apr-Jun	2B.2	S2	G4
<u>Piperia candida</u>	white-flowered rein orchid	Orchidaceae	perennial herb	(Mar)May-Sep	1B.2	S3	G3
<u>Pityopus californicus</u>	California pinefoot	Ericaceae	perennial herb (achlorophyllous)	(Mar-Apr)May-Aug	4.2	S4	G4G5
<u>Pleuropogon refractus</u>	nodding semaphore grass	Poaceae	perennial rhizomatous herb	(Mar)Apr-Aug	4.2	S4	G4
<u>Poa rhizomata</u>	timber blue grass	Poaceae	perennial rhizomatous herb	Apr-May	4.3	S3S4	G4?
<u>Polemonium carneum</u>	Oregon polemonium	Polemoniaceae	perennial herb	Apr-Sep	2B.2	S2	G3G4
<u>Potamogeton foliosus ssp. fibrillosus</u>	fibrous pondweed	Potamogetonaceae	perennial rhizomatous herb (aquatic)	unk	2B.3	S1S2	G5T2T4
<u>Prosartes parvifolia</u>	Siskiyou bells	Liliaceae	perennial bulbiferous herb	May-Sep	1B.2	S1S2	G2
<u>Pyrocoma racemosa var. congesta</u>	Del Norte pyrocoma	Asteraceae	perennial herb	Aug-Sep	2B.3	S2	G5T4
<u>Ramalina thrausta</u>	angel's hair lichen	Ramalinaceae	fruticose lichen (epiphytic)		2B.1	S2?	G5
<u>Ribes laxiflorum</u>	trailing black currant	Grossulariaceae	perennial deciduous shrub	Mar-Jul(Aug)	4.3	S3	G5?
<u>Romanzoffia tracyi</u>	Tracy's romanzoffia	Hydrophyllaceae	perennial herb	Mar-May	2B.3	S2	G4
<u>Rosa gymnocarpa var. serpentina</u>	Gasquet rose	Rosaceae	perennial rhizomatous shrub	Apr-Jun(Aug)	1B.3	S2	G5T3T4
<u>Sabulina howellii</u>	Howell's sandwort	Caryophyllaceae	annual herb	Apr-Jul	1B.3	S3	G4
<u>Sagittaria sanfordii</u>	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
<u>Salix delnortensis</u>	Del Norte willow	Salicaceae	perennial deciduous shrub	Apr-May	4.3	S4	G4
<u>Sanguisorba officinalis</u>	great burnet	Rosaceae	perennial rhizomatous herb	Jul-Oct	2B.2	S2	G5?
<u>Sanicula peckiana</u>	Peck's sanicle	Apiaceae	perennial herb	Mar,May,Jun	4.3	S3	G4
<u>Sedum citrinum</u>	Blue Creek stonecrop	Crassulaceae	perennial herb	Jun	1B.2	S2	G2
<u>Sidalcea elegans</u>	Del Norte checkerbloom	Malvaceae	perennial rhizomatous herb	May-Jul	3.3	S2?	G4?
<u>Sidalcea malachroides</u>	maple-leaved checkerbloom	Malvaceae	perennial herb	(Mar)Apr-Aug	4.2	S3	G3

<u>Sidalcea malviflora ssp. patula</u>	Siskiyou checkerbloom	Malvaceae	perennial rhizomatous herb	(Apr)May-Aug	1B.2	S2	G5T2
<u>Sidalcea oregana ssp. eximia</u>	coast checkerbloom	Malvaceae	perennial herb	Jun-Aug	1B.2	S1	G5T1
<u>Silene scouleri ssp. scouleri</u>	Scouler's catchfly	Caryophyllaceae	perennial herb	(Mar-May)Jun-Aug(Sep)	2B.2	S2S3	G5T4T5
<u>Silene serpentinicola</u>	serpentine catchfly	Caryophyllaceae	perennial rhizomatous herb	May-Jul	1B.2	S3	G3
<u>Streptanthus howellii</u>	Howell's jewelflower	Brassicaceae	perennial herb	Jul-Aug	1B.2	S2	G2G3
<u>Tauschia glauca</u>	glaucous tauschia	Apiaceae	perennial herb	Apr-Jun	4.3	S4	G4
<u>Thermopsis robusta</u>	robust false lupine	Fabaceae	perennial rhizomatous herb	May-Jul	1B.2	S2	G2
<u>Tiarella trifoliata var. trifoliata</u>	trifoliate laceflower	Saxifragaceae	perennial rhizomatous herb	(May)Jun-Aug	3.2	S2S3	G5T5
<u>Triquetrella californica</u>	coastal triquetrella	Pottiaceae	moss		1B.2	S2	G2
<u>Usnea longissima</u>	Methuselah's beard lichen	Parmeliaceae	fruticose lichen (epiphytic)		4.2	S4	G4
<u>Vaccinium scoparium</u>	little-leaved huckleberry	Ericaceae	perennial deciduous shrub	Jun-Aug	2B.2	S3	G5
<u>Vancouveria chrysantha</u>	Siskiyou inside-out-flower	Berberidaceae	perennial rhizomatous herb	Jun	4.3	S3	G4
<u>Veratrum insolitum</u>	Siskiyou false-hellebore	Melanthiaceae	perennial herb	Jun-Aug	4.3	S4	G4
<u>Viola langsdorffii</u>	Langsdorf's violet	Violaceae	perennial herb	May-Jul	2B.1	S1	G4
<u>Viola palustris</u>	alpine marsh violet	Violaceae	perennial rhizomatous herb	Mar-Aug	2B.2	S1S2	G5
<u>Viola primulifolia ssp. occidentalis</u>	western white bog violet	Violaceae	perennial rhizomatous herb	Apr-Sep	1B.2	S2	G5T2

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website <http://www.rareplants.cnps.org> [accessed 17 June 2019].

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Special Status and Other CRPR Plants Identified During Pre-field Investigation Known or with Potential to Occur in the Region of the Last Chance Grade Geotechnical Exploration Phase 2B ESL.

Scientific Name	Common Name	Family	CRPR	Global Rank	State Rank	CESA	FESA	Blooming Period	Habitats	Elev. Low (m)	Elev. High (m)	Potential to Occur within the ESL
<i>Angelica lucida</i>	sea-watch	Apiaceae	4.2	G5	S3	None	None	May-Sep	Coastal bluff scrub, Coastal dunes, Coastal scrub, Marshes and swamps (coastal salt)	0	150	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Anthoxanthum nitens</i> ssp. <i>nitens</i>	vanilla-grass	Poaceae	25.3	G5	S2	None	None	Apr-Jul	Meadow and seep, Wetland	1,500	1,895	None: no potential habitat present
<i>Asplenium trichomanes</i> ssp. <i>trichomanes</i>	maidenhair spleenwort	Aspleniaceae	25.1	G5T5	S1	None	None	May-Jul	Lower montane coniferous forest (rocky)	185	200	None: no potential habitat present
<i>Bryoria pseudocapillaris</i>	false gray horsehair lichen	Parmeliaceae	3.2	G3	S2	None	None	N/A	Coastal dunes (SLO Co.), North Coast coniferous forest (immediate coast)	0	90	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Bryoria spirallifera</i>	twisted horsehair lichen	Parmeliaceae	15.1	G3	S1S2	None	None	N/A	North Coast coniferous forest	0	30	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Calamagrostis bolanderi</i>	Bolander's reed grass	Poaceae	4.2	G4	S4	None	None	May-Aug	Bogs and fens, Broadleaved upland forest, Closed-cone coniferous forest, Coastal scrub, Meadows and seeps (mesic), Marshes and swamps (freshwater), North Coast coniferous forest	0	455	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Calamagrostis crassiglumis</i>	Thurber's reed grass	Poaceae	25.1	G3Q	S2	None	None	May-Aug	Coastal scrub, Freshwater marsh, Marsh and swamp, Wetland	5	50	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Calamagrostis foliosa</i>	leafy reed grass	Poaceae	4.2	G3	S3	Rare	None	May-Sep	Coastal bluff scrub, North Coast coniferous forest	0	1,220	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Calium adpersum</i>	spiral-spored glided-head pin lichen	Caliciaceae	25.2	G3G4	S1?	None	None	N/A	Lower montane coniferous forest, North Coast coniferous forest	200	200	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Cardamine angulata</i>	seaside bittercress	Brassicaceae	25.1	G4G5	S3	None	None	(Jan)Mar-Jul	Lower montane coniferous forest, North Coast coniferous forest, Wetland	5	915	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Carex acuta</i>	northern clustered sedge	Cyperaceae	25.2	G5	S1	None	None	Jun-Sep	Bog and fen, North Coast coniferous forest, Wetland	60	1,400	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Carex buxbaumii</i>	Buxbaum's sedge	Cyperaceae	4.2	G5	S3	None	None	Mar-Aug	Bogs and fens, Meadows and seeps (mesic), Marshes and swamps	3	3300	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Carex leptalea</i>	bristle-stalked sedge	Cyperaceae	25.2	G5	S1	None	None	Mar-Jul	Bog and fen, Freshwater marsh, Marsh and swamp, Meadow and seep, Wetland	0	1395	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Carex pratensis</i>	northern meadow sedge	Cyperaceae	25.2	G5	S2	None	None	May-Jul	Meadow and seep, Wetland	0	3200	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Carex saliniformis</i>	deceiving sedge	Cyperaceae	15.2	G2	S2	None	None	Jun(Jul)	Coastal prairie, Coastal scrub, Marsh and swamp, Meadow and seep, Wetland	2	230	None: no potential habitat present
<i>Carex viridula</i> ssp. <i>viridula</i>	green yellow sedge	Cyperaceae	25.3	G5T5	S2	None	None	(Jun)Jul-Sep(Nov)	Bog and fen, Marsh and swamp, North Coast coniferous forest, Wetland	0	1705	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the

Scientific Name	Common Name	Family	CRPR	Global Rank	State Rank	CESA	FESA	Blooming Period	Habitats	Elev. Low (m)	Elev. High (m)	Potential to Occur within the ESL
												region (coastal Del Norte County and northern coastal Humboldt County)
<i>Cascadia nuttallii</i>	Nuttall's saxifrage	Saxifragaceae	2B.1	G4?	S1	None	None	May	North Coast coniferous forest	35	80	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Castilleja ambigua</i> ssp. <i>ambigua</i>	johnny-nip	Orobanchaceae	4.2	G4T4	S3S4	None	None	Mar-Aug	Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps, Valley and foothill grassland, Vernal pools margins	0	435	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Castilleja litoralis</i>	Oregon coast paintbrush	Orobanchaceae	2B.2	G3	S3	None	None	Jun-Jul	Coastal bluff scrub, Coastal dunes, Coastal scrub	5	255	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Chrysopsisium glechonifolium</i>	Pacific golden saxifrage	Saxifragaceae	4.3	G5	S3	None	None	Feb-Jun(Jul)	North Coast coniferous forest, Riparian forest	10	455	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Coptis laciniata</i>	Oregon goldthread	Ranunculaceae	4.2	G4?	S3?	None	None	(Feb)/Mar-May(Sep-Nov)	Meadows and seeps, North Coast coniferous forest (streambanks)	0	1000	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Disceastrum nudum</i>	naked flag moss	Disceastraceae	2B.2	G4G5	S1	None	None	N/A	Coastal bluff scrub (soil, on clay banks)	10	50	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Eleocharis parvula</i>	small spikegrass	Cyperaceae	4.3	G5	S3	None	None	(Apr)/Jun-Aug(Sep)	Marshes and swamps	1	3020	None: no potential habitat present
<i>Empetrum nigrum</i>	black crowberry	Empetraceae	2B.2	G5	S1?	None	None	Apr-Jun	Coastal bluff scrub, Coastal prairie	3	200	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Erigeron cernuus</i>	Siskiyou daisy	Asteraceae	4.3	G4	S4	None	None	Jun-Aug	Lower montane coniferous forest, Meadows and seeps	25	1900	None: no potential habitat present
<i>Eriogonum nudum</i> var. <i>parvifolium</i>	Del Norte buckwheat	Polygonaceae	2B.2	G5T2	S1	None	None	Jun-Aug, Sep	Coastal bluff scrub, Coastal prairie	5	80	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Erysimum concinnum</i>	bluff wallflower	Brassicaceae	1B.2	G3	S2	None	None	Feb-Jul	Coastal bluff scrub, Coastal dunes, Coastal prairie	0	185	None: no potential habitat present
<i>Erythronium hendersonii</i>	Henderson's fawn lily	Liliaceae	2B.3	G4	S2	None	None	Apr-Jul	Lower montane coniferous forest	60	1800	None: no potential habitat present
<i>Erythronium howellii</i>	Howell's fawn lily	Liliaceae	1B.3	G3G4	S2	None	None	Apr-May	Lower montane coniferous forest, North Coast coniferous forest	120	1150	None: no potential habitat present
<i>Erythronium oregonum</i>	giant fawn lily	Liliaceae	2B.2	G4G5	S2	None	None	Mar-Jun(Jul)	Cismontane woodland, Meadows and seeps	100	1435	None: no potential habitat present
<i>Erythronium revolutum</i>	coast fawn lily	Liliaceae	2B.2	G4G5	S3	None	None	Mar-Jul(Aug)	Bogs and fens, Broadleaved upland forest, North Coast coniferous forest	0	1800	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Fissidens pauperculus</i>	minute pocket moss	Fissidentaceae	1B.2	G3?	S2	None	None	N/A	North Coast coniferous forest (damp coastal soil)	10	1024	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL

Scientific Name	Common Name	Family	CRPR	Global Rank	State Rank	CESA	FESA	Blooming Period	Habitats	Elev. Low (m)	Elev. High (m)	Potential to Occur within the ESL
<i>Gilia capitata</i> ssp. <i>pacifica</i>	Pacific gilia	Polemoniaceae	1B.2	G5T3	S2	None	None	Apr-Aug	Coastal bluff scrub, Chaparral (openings), Coastal prairie, Valley and foothill grassland	5	1685	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Hesperisax sparsiflora</i> var. <i>brevifolia</i>	short-leaved evax	Asteraceae	1B.2	G4T3	S2	None	None	Mar-Jun	Coastal bluff scrub (sandy), coastal dunes, coastal prairies	0	640	None: no potential habitat present
<i>Hoackia gracilis</i>	harlequin lotus	Fabaceae	4.2	G3G4	S3	None	None	Mar-Jul	Broadleaved upland forest, Coastal bluff scrub, Closed-cone coniferous forest, Montane woodland, Coastal prairie, Marshes and swamps, North Coast coniferous forest, Valley and foothill grassland (wetlands, roadsides)	0	700	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Ilama latibracteata</i>	California globe mallow	Malvaceae	1B.2	G2G3	S2	None	None	Jun-Aug	Chaparral (montane), Lower montane coniferous forest, North Coast coniferous forest (mesic), Riparian scrub (streambanks)	60	2000	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Iris thompsonii</i>	Thompson's iris	Iridaceae	4.3	G3	S3	None	None	(Mar-Apr) Max-Jun (Jul-Aug)	Lower montane coniferous forest, North Coast coniferous forest	90	600	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Kopslopsis hookeri</i>	small groundcone	Orobanchaceae	2B.3	G4?	S1S2	None	None	Apr-Aug	North Coast coniferous forest	90	1435	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Lasthenia californica</i> ssp. <i>macrantha</i>	perennial goldfields	Asteraceae	1B.2	G3T2	S2	None	None	Jan-Nov	Coastal bluff scrub, Coastal dunes, Coastal scrub	5	520	None: no potential habitat present
<i>Lathyrus palustris</i>	marsh pea	Fabaceae	2B.2	G5	S2	None	None	Mar-Aug	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Marshes and swamps, North Coast coniferous forest	1	140	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Lilium kelloggii</i>	Kellogg's lily	Liliaceae	4.3	G3	S3	None	None	May-Aug	Lower montane coniferous forest, North Coast coniferous forest	3	1300	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Lilium occidentale</i>	western lily	Liliaceae	1B.1	G1	S1	CE	FE	Jun-Jul	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps (freshwater), North Coast coniferous forest (openings)	2	185	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Lilium pardalinum</i> ssp. <i>vulneri</i>	Vulmer's lily	Liliaceae	4.3	G5T4	S3	None	None	(Jun-Jul) Aug	Bogs and fens, Meadows and seeps (mesic)	30	1680	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Listera cordata</i>	heart-leaved twayblade	Orchidaceae	4.2	G5	S4	None	None	Feb-Jul	Bogs and fens, Lower montane coniferous forest, North Coast coniferous forest	5	1370	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Lomatium maritima</i>	Coast Range lomatium	Apiaceae	2B.3	G5	S2	None	None	May-Jun(Aug)	Coastal bluff scrub, Lower montane coniferous forest, Meadows and seeps	240	3000	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Lycopodiella mundula</i>	inundated bog club-moss	Lycopodiaceae	2B.2	G5	S1?	None	None	Jun-Sep	Bogs and fens (coastal), Lower montane coniferous forest (mesic), Marshes and swamps (lake margins)	5	1000	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Lycopodium clavatum</i>	running-pine	Lycopodiaceae	4.1	G5	S3	None	None	Jun-Aug(Sep)	Lower montane coniferous forest (mesic), Marshes and swamps, North Coast coniferous forest (mesic)	45	1225	Moderate: suitable habitat is present and occurrences are recorded from the region

Scientific Name	Common Name	Family	CRPR	Global Rank	State Rank	CESA	FESA	Blooming Period	Habitats	Elev. Low (m)	Elev. High (m)	Potential to Occur within the ESL
<i>Lysimachia europaea</i>	arctic starflower	Myrsinaceae	2B.2	G5	S1	None	None	Jun-Jul	Bogs and fens, Meadows and seeps	0	15	None: no potential habitat present
<i>Mitella caulescens</i>	leafy-stemmed mitrewort	Saxifragaceae	4.2	G5	S4	None	None	(Mar)Apr-Oct	Broadleafed upland forest, Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest	5	1700	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Moneses uniflora</i>	woodnymph	Ericaceae	2B.2	G5	S2	None	None	May-Aug	Broadleafed upland forest, North Coast coniferous forest	50	1100	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Monotropa uniflora</i>	ghost-pipe	Ericaceae	2B.2	G5	S2	None	None	Jun-Aug(Sep)	Broadleafed upland forest, North Coast coniferous forest	10	855	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Montia howellii</i>	Howell's montia	Montiaceae	2B.2	G3G4	S2	None	None	(Jan-Feb)Mar-May	Meadows and seeps, North Coast coniferous forest, Vernal pools	0	1215	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Oenothera wolffii</i>	Wolf's evening-primrose	Onagraceae	1B.1	G2	S1	None	None	May-Oct	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest	0	800	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Oxalis suksdorfii</i>	Suksdorf's wood-sorrel	Oxalidaceae	4.3	G4	S3	None	None	May-Aug	Broadleafed upland forest, North Coast coniferous forest	15	700	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Packera bolanderi</i> var. <i>bolanderi</i>	seacoast ragwort	Asteraceae	2B.2	G4T4	S2S3	None	None	(Jan-Apr)May-Jul(Aug)	Coastal scrub, North Coast coniferous forest	30	915	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Piperia candida</i>	white-flowered rein orchid	Orchidaceae	1B.2	G3	S3	None	None	(Mar)May-Sep	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest	20	1615	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Phycopus californicus</i>	California pinfoot	Ericaceae	4.2	G4G5	S4	None	None	(Mar-Apr)May-Aug	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest, Upper montane coniferous forest	15	2225	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Pleuropogon refractus</i>	nodding semaphore grass	Poaceae	4.2	G4	S4	None	None	(Mar)Apr-Aug	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest, Riparian forest	0	1600	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Polemonium carneum</i>	Oregon polemonium	Polemoniaceae	2B.2	G3G4	S2	None	None	Apr-Sep	Coastal prairie, Coastal scrub, Lower montane coniferous forest	0	1830	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Potamogeton foliosus</i> ssp. <i>fertilissus</i>	fibrous pondweed	Potamogetonaceae	2B.3	G5T2T4	S1S2	None	None	unk	Marshes and swamps (assorted shallow freshwater)	5	1300	None: no potential habitat present
<i>Ramalina thrausta</i>	angel's hair lichen	Ramalinaceae	2B.1	G5	S2?	None	None	N/A	North Coast coniferous forest	75	430	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Ribes laxiflorum</i>	trailing black currant	Grossulariaceae	4.3	G5?	S3	None	None	Mar-Jul(Aug)	North Coast coniferous forest	5	1395	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Romanzoffia tracyi</i>	Tracy's romanzoffia	Hydrophyllaceae	2B.3	G4	S2	None	None	Mar-May	Coastal bluff scrub, Coastal scrub	15	30	None: no potential habitat present
<i>Sagittaria sanfordii</i>	Sanford's arrowhead	Alismataceae	1B.2	G3	S3	None	None	May-Oct(Nov)	Marsh and swamp, Wetland	0	605	None: no potential habitat present

Scientific Name	Common Name	Family	CRPR	Global Rank	State Rank	CESA	FESA	Blooming Period	Habitats	Elev. Low (m)	Elev. High (m)	Potential to Occur within the ESL
<i>Sanguisorba officinalis</i>	great burnet	Rosaceae	2B.2	G57	S2	None	None	Jul-Oct	Bog and fen, Broadleaved upland forest, Marsh and swamp, Meadow and seep, North Coast coniferous forest, Riparian forest, Ultramafic, Wetland	60	1420	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Sidalcea malachroides</i>	maple-leaved checkerbloom	Malvaceae	4.2	G3	S3	None	None	(Mar)Apr-Aug	Broadleaved upland forest, Coastal prairie, Coastal scrub, North Coast coniferous forest, Riparian woodland	0	765	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Sidalcea malviflora</i> ssp. <i>patula</i>	Siskiyou checkerbloom	Malvaceae	1B.2	G572	S2	None	None	(Apr)May-Aug	Coastal bluff scrub, Coastal prairie, North Coast coniferous forest	5	1255	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Sidalcea oregana</i> ssp. <i>eximia</i>	coast checkerbloom	Malvaceae	1B.2	G571	S1	None	None	Jun-Aug	Lower montane coniferous forest, Meadow and seep, North Coast coniferous forest, Wetland	5	1805	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Silene scouleri</i> ssp. <i>scouleri</i>	Scouler's catchfly	Caryophyllaceae	2B.2	G57475	S2S3	None	None	(Mar, May)Jun-Aug(Sep)	Coastal bluff scrub, Coastal prairie, Valley and foothill grassland	0	600	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Tarebia trifoliata</i> var. <i>trifoliata</i>	trifoliate laceflower	Saxifragaceae	3.2	G575	S2S3	None	None	(May)Jun-Aug	Lower montane coniferous forest, North Coast coniferous forest (edges, moist shady banks, streambanks)	170	1500	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Trichodon cylindricus</i>	cylindrical trichodon	Ditrichaceae	2B.2	G4	S2	None	None	N/A	Broadleaved upland forest, Meadows and seeps, Upper montane coniferous forest	50	2002	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Triquetrella californica</i>	coastal triquetrella	Pottiaceae	1B.2	G2	S2	None	None	N/A	Coastal bluff scrub, Coastal scrub	10	100	Moderate: suitable habitat is present and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
<i>Usnea longissima</i>	Methuselah's beard lichen	Parmeliaceae	4.2	G4	S4	None	None	N/A	Broadleaved upland forest, North Coast coniferous forest	45	1465	High: suitable habitat is present and occurrences are recorded within 5 miles of ESL
<i>Viola langsdorffii</i>	Langsdorf's violet	Violaceae	2B.1	G4	S1	None	None	May-Jul	Bog and fen, Wetland	2	10	None: no potential habitat present
<i>Viola palustris</i>	alpine marsh violet	Violaceae	2B.2	G5	S1S2	None	None	Mar-Aug	Bog and fen, Coastal scrub, Wetland	0	150	Low: minor amount of suitable habitat is present or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)



Appendix C. Title VI Policy Statement



DEPARTMENT OF TRANSPORTATION

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a California Way of Life.*

April 2018

**NON-DISCRIMINATION
POLICY STATEMENT**

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964, ensures *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."*

Related federal statutes and state law further those protections to include sex, disability, religion, sexual orientation, and age.

For information or guidance on how to file a complaint, please visit the following web page:
http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

To obtain this information in an alternate format such as Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone (916) 324-8379, TTY 711, email Title.VI@dot.ca.gov, or visit the website www.dot.ca.gov.

A handwritten signature in blue ink, appearing to read "Laurie Berman".

LAURIE BERMAN
Director

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to enhance California's economy and livability"*



Appendix D. Section 4(f)



Section 4(f) of the Department of Transportation Act of 1966, codified in federal law at 49 United States Code (USC) 303, declares that “it is the policy of the United States Government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites.”

Section 4(f) specifies that the Secretary of Transportation may approve a transportation program or project . . . “requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- There is no prudent and feasible alternative to using that land; and
- The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.”

Section 4(f) further requires coordination with the Department of the Interior and, as appropriate, the involved offices of the Department of Agriculture and the Department of Housing and Urban Development in developing transportation projects and programs that use lands protected by Section 4(f). If historic sites are involved, then coordination with the State Historic Preservation Officer is also needed.

Section 6009(a) of SAFETEA-LU amended Section 4(f) legislation at 23 United States Code (USC) 138 and 49 USC 303 to simplify the processing and approval of projects that have only *de minimis* impacts on lands protected by Section 4(f). This amendment provides that once the U.S. Department of Transportation (USDOT) determines that a transportation use of Section 4(f) property, after consideration of any impact avoidance, minimization, and mitigation or enhancement measures, results in a *de minimis* impact on that property, an analysis of avoidance alternatives is not required, and the Section 4(f) evaluation process is complete. FHWA’s final rule on Section 4(f) *de minimis* findings is codified in 23 Code of Federal Regulations (CFR) 774.3 and CFR 774.17.

Responsibility for compliance with Section 4(f) has been assigned to Caltrans pursuant to 23 USC 326 and 327 and a Memorandum of Understanding executed between FHWA and Caltrans (dated December 23, 2016), including *de minimis* impact determinations, as well as coordination with those agencies that have jurisdiction over a Section 4(f) resource that may be affected by a project action.

The activities associated with the geotechnical investigation would occur within Redwood National and State Parks. Consultation with State Parks and the National Park Service is ongoing, and the draft Section 4(f) analyses are on the following pages.



DEPARTMENT OF TRANSPORTATION

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*Making Conservation
a California Way of Life.*

January 25, 2020

Mr. Steve Mietz
Superintendent, Redwood National Park
1111 Second Street
Crescent City, CA 95531

**Re: Section 4(f) *de minimis* concurrence for the Phase 2B Geotechnical Study for the Last
Change Grade Project**

Dear Mr. Mietz:

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose to conduct geotechnical studies to obtain information needed to develop a long-term solution to the instability and potential roadway failure of a portion of U.S. Highway 101 (Highway 101) between Post Miles (PM) 12.0 and 15.5 at "Last Chance Grade" (LCG) in Del Norte County. The geotechnical study (also known as Phase 2B) would include investigations within portions of Redwood National Park (RNP) and Del Norte Coast Redwoods State Park (DNCRSP) (see attached Figures 1 and 2, and Phase 2B Detailed Layouts). Under Section 4(f) of the Department of Transportation Act of 1996, both Parks are considered Section 4(f) resources. Therefore, a Section 4(f) analysis, a determination, and Park concurrence are needed.

The purpose of the Phase 2B study is to characterize the geology within the project area. The characterization would occur through the analysis of soil and rock samples, groundwater data, and measurements of slope movement. The information is needed to be able to evaluate and identify geotechnically critical sites, such as bridge abutments and tunnel portals.

To conduct the studies, minor vegetation clearing, material staging, drilling of boreholes, installation of standpipe piezometers or slope indicators (SI), minor grading of existing trails and roads, and seismic refraction line activities would be required. All activities would be temporary in nature; no Permanent Incorporation of Park land is proposed, and no Constructive Use is anticipated.

This letter is to inform you of Caltrans' intent to make a *de minimis* finding for the impacts to RNP. The following pages provide detailed information related to Section 4(f) and Section 4(f) resources, and geotechnical investigation activities. Through this letter Caltrans is seeking concurrence from the National Park Service (NPS) for activities on federal land within RNP; Caltrans is seeking concurrence from California State Parks for the activities within DNCRSP separately.

DESCRIPTION OF SECTION 4(f)

Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 that established the requirement for consideration of park and recreation lands, wildlife and waterfowl refuges, and historic sites during transportation project development. The law, now codified in 49 U.S.C. Section 303 and 23 U.S.C. Section 138, applies only to the U.S. Department of Transportation (U.S. DOT) and is implemented by the Federal Highway Administration (FHWA) through the regulation 23 Code of Federal Regulations (CFR) 774. Section 4(f) applies to projects

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that receive funding from or require approval by an agency of the U.S. DOT. Responsibility for compliance with Section 4(f) has been assigned to Caltrans pursuant to 23 USC 326 and 327, including *de minimis* impact determinations.

There are three types of “use” under Section 4(f):

- 1) Permanent Incorporation – when a Section 4(f) resource is acquired outright for a transportation project.
- 2) Temporary Occupancy – when there is temporary use of resource that is adverse in terms of Section 4(f)'s preservationist purpose. Temporary occupancy is not a Section 4(f) use if all of the following conditions exist:
 - a. The land use is of short duration (defined as less than the time needed for the construction of the project)
 - b. There is no change in ownership of the land
 - c. The scope of the work must be minor
 - d. There are no temporary or permanent adverse changes to the activities, features, or attributes of the resource
 - e. The land must be fully restored to a condition at least as good as prior to the project
 - f. There must be documented agreement from the official(s) with jurisdiction over the resource with the above conditions
- 3) Constructive Use – when the proximity impacts of a transportation project on a Section 4(f) resource, even without acquisition of the resource, are so great that the activities, features and attributes of the resource are substantially impaired.

Before approving a project that uses a Section 4(f) resource, a determination must be made that either:

- 1) There is no feasible and prudent alternative that avoids the resource, and that the project includes all possible planning to minimize harm to the resource, or
- 2) The project would have a *de minimis* impact on the resource.

A *de minimis* impact is one that would not adversely affect the activities, features, or attributes of the Section 4(f) resource, and, subsequently, would not require an analysis of feasible and prudent avoidance alternatives.

A determination of *de minimis* impact may be made when all three of the following criteria are satisfied:

- 1) The transportation use of the Section 4(f) resource, together with any impact avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f);
- 2) The public has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) resource; and
- 3) The official(s) with jurisdiction over the resource are informed of Caltrans' intent to make the *de minimis* impact determination based on their written concurrence that the project

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would not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

PROJECT DESCRIPTION

The Phase 2B geotechnical investigation will support the Last Chance Grade Permanent Restoration Project, which proposes to develop a permanent solution to the instability and potential roadway failure at LCG. The purpose of the investigation is to characterize the geology within the project area and along potential roadway alignments. The characterization would occur through the analysis of soil and rock samples, groundwater data, and measurements of slope movement. The information is needed to evaluate and identify geotechnically critical sites, including locations of potential bridge abutments and tunnel portals.

The proposed Phase 2B geotechnical investigation would include 15 boring locations (with two alternative sites [B-30B and B-34B] under consideration) and 14 seismic refraction line survey locations. Of these, only 7 boring and 4 seismic refraction line locations would be located within RNP. The remainder would be within DNCRSP or on Green Diamond Resource Company land. Of the 15 boring locations, 6 would be accessed by helicopter; however, none of these helicopter sites are located within National Park Service land. Please see Figures 1 and 2 and the Phase 2B Detailed Layouts for the boring and seismic survey line locations.

Drilling Sites within Redwood National Park

Drilling locations B-23 and B-24 would be accessed and drilled on existing roads east of Highway 101. No vegetation removal or grading is proposed at these sites.

Sites B-19, B-20, B-25, and B-26 would be accessed from an existing National Park Service road and the DeMartin section of the Coastal Trail. A large existing clearing adjacent to the access road would be used for staging. Brushing, tree removal and grading on sections of the access road and trail is anticipated (see attached Phase 2B Detailed Layouts). A rubber track rig (less than 6 feet wide) would be used to minimize disturbance within the park. It is anticipated that this section of the Coastal Trail and the DeMartin Campground would need to be closed for approximately 6-8 weeks to complete the initial access work, drilling, and site restoration. Select large ferns within disturbance areas would be removed and transplanted. Erosion control measures would be implemented to treat disturbed areas.

Site B-22 is located upslope from Highway 101. To create access, grading and filling of an existing erosional scar (up to 15 feet deep) is proposed. Post operation, an approximate 12 by 400-foot rock dissipation structure would be constructed to prevent future erosion. Once constructed the structure would be self-sustaining and not need any short- or long-term maintenance.

Drilling Equipment

The following equipment would be required for the investigation: a platform, track- or truck-mounted drill rig equipped with a Standard Penetration Test (SPT) hammer, water truck, crew cab, and a geologist/engineer's vehicle. Portable ground protection mats may be used to aid vehicular access and protect soft ground surfaces. As a construction best management practice (BMP), plastic sheeting and straw wattle would be used to contain any drilling fluid.

The SPT is an in situ dynamic penetration test designed to provide geotechnical engineering properties of the soil. The SPT hammer uses a thick-walled split-spoon sample tube approximately 25.6 inches long with an outside diameter of 2 inches and inside diameter of 1.4 inches. This tube

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would be driven into the ground by a 140-pound slide hammer freefalling 30 inches. The tube would be driven 18 inches into the ground, or until hammer refusal. Table 1 summarizes noise levels typically produced by a Mobile B-47 drill rig equipped with an SPT hammer during both drilling and SPT operations.

Given their location, boreholes B-19, B-20, B-25, and B-26 are assumed to have ambient noise levels that are “natural” (up to 50 dB) to “very low” (51–60 dB). Given being adjacent to the highway, boreholes B-22, B-23, and B-24 are assumed to have higher ambient noise levels than the other locations but the levels are still anticipated to be very low. Drilling would not be expected to exceed 79 dB in areas where “natural ambient” noise levels are < 50 dB (U.S. Fish and Wildlife Service 2006)¹.

Table 1: Summary of Drilling Noise Study Results

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

Each boring is anticipated to take approximately one week to complete. The drill rig would typically be stored at the drill site at the end of each workday. The geologist/engineer’s vehicle would be moved offsite at the end of each workday.

Drilling Procedure

To obtain quality soil and rock samples at the depths needed, a mud rotary drilling system would be required for the borings. Borings would be 4.75 inches in diameter and would extend approximately 100 feet below ground surface (bgs). The system requires 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 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-millimeter drill rod, and mud tank. The mud tank would be positioned on the ground surface adjacent to the drill rig and would serve as a settling tank for soil cuttings. The cuttings would be removed periodically and placed in 55-gallon steel drums, which would be transferred to a fenced staging area.

Standpipe monitoring wells or slope indicators may be installed in the boring excavations; these would be monitored periodically for up to 2 years before being destroyed in accordance with the Del Norte County Environmental Health Division’s requirements. Holes receiving a monitoring well would be flushed with clean water before a slotted PVC standpipe is installed and the annular space filled with clean #8 sand. The hole would be sealed with bentonite plugs to prevent infiltration of surface water or migration of water between aquifers. During drilling, the drill crew and

¹ U.S. Fish and Wildlife Service. 2006. Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California. U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office. Arcata, California.

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geologist/engineer onsite would monitor for any leaks or spills of drilling fluid. If drilling fluid were to leak, the drill crew would immediately contain the escaping fluid and clean the impacted area.

Seismic Surveys

Seismic refraction line surveys are conducted to help characterize the subsurface conditions, estimate the depth to rock, and evaluate rip-ability of proposed excavations. The surveys would be performed on foot. Vegetation removal would consist of limited trimming of ground-level undergrowth in an up to 4-foot-wide strip (enough to lay out the equipment).

The survey lines would be between 200 and 600 feet long and would take approximately 2 days to complete. The surveys involve placing 24 small geophones (seismic sensors) on the ground in a straight line at equal spacing. The geophones have a 1-inch long prong that is pressed into the ground (usually by foot) to hold the geophone firmly so that shock waves are transmitted to the potentiometers inside the geophone. The geophones transmit a signal to a seismograph unit by a specialized cable. Shock waves would be created by slamming a 12- to 16-pound human-powered sledgehammer against a striker plate placed on at least seven different locations along the refraction line. The striker plate consists of an 8-inch square and a 0.75-inch thick steel plate or high-density polyethylene (HDPE) plate. The noise from the hammer striking the metal plate is estimated at 108 dB at 9.8 feet (3 meters) and is approximately 85 dB at 50 feet (15 meters).

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 provide insufficient energy to cover the entire survey line, a shock-producing device involving a down-hole shotgun would be used. The down-hole shotgun uses an industrial shell fired in a minimum 1.5-foot deep water-filled hole created by a hand auger. The industrial shell is an 8-gauge 350- to 500-grain blank shotgun cartridge. Shells are triggered approximately 20 minutes apart. Shotgun detonations may leave an area of disturbed earth up to 2 feet in diameter. Disturbed soil would be tamped down to return it to its original condition. Detonation of the shells occurs below ground and usually does not pose a fire hazard, but fire suppression equipment would be 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.

Anticipated Schedule

Phase 2B drilling and seismic survey activities are anticipated to occur between September 15, 2020 and January 31, 2021. Because it poses minimal potential disruption to highway traffic, work would be conducted during the day. If needed, drilling time restrictions would be observed at certain locations to minimize potential disturbance to nearby resources.

Post Exploration Clean-Up Operations

After the completion of each 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 be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean surfaces to prevent contamination of future storm-water or impacts to public safety, a minimal amount would be used and as much of the dirty water captured as practical. Any areas of ground disturbance created during off-road drilling activities would be treated with appropriate BMPs to prevent erosion and stormwater pollution. Borings that do not receive a monitoring pipe would be backfilled using neat cement grout.

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DESCRIPTION OF THE SECTION 4(F) RESOURCE

The National Park Service and California State Parks jointly manage Redwood National and State Parks, which totals 133,000 acres of land and includes Redwood National Park (RNP), Del Norte Coast Redwoods State Park (DNCRSP), Jedediah Smith Redwoods State Park, and Prairie Creek Redwoods State Park. Redwood National and State Parks are recognized by the United Nations as a World Heritage Site. The parks in the project vicinity are accessed from Highway 101. Redwood National and State Parks is open every day and year-round.

Redwood National and State Parks offer various recreational activities such as fishing, hiking, and camping and beach access. Various trails provide bike, equestrian, and pedestrian access. There are various picnic areas, scenic drives and overlooks, wildlife watching locations, and tide pools. The Parks also hosts a section of the California Coastal Trail, a network of trails that, once completed, will span California from Oregon to Mexico. In the project vicinity, the Parks are accessed from Highway 101.

Redwood National and State Parks have multiple developed and undeveloped backcountry campgrounds. In the project vicinity, the closest developed campground is the Mill Creek Campground which is located north of the project limits and is within DNCRSP. The campground offers 143 sites (without hookups) and is open from May through September each year. The closest undeveloped backcountry campground is the DeMartin Campground, which is located within RNP and is within the project limits. The campground has 10 campsites and can be accessed by foot along the Coastal Trail.

One Section 4(f) historic property, a portion of the Crescent City to Trinidad Wagon Road, has been identified within the Area of Potential Effects (APE) for portions of this project on NPS land. The agency with jurisdiction for this historic property is the California State Historic Preservation Officer (SHPO). Caltrans has consulted with NPS on a Section 4(f) de minimus determination for the wagon road through the National Historic Preservation Act (NHPA) consultation process. Caltrans will be seeking SHPO concurrence on this determination through a separate process. Section 4(f) concurrence on historic properties is not part of this correspondence.

USE OF SECTION 4(F) RESOURCE

There would be no Permanent Incorporation or Constructive Use impacts associated with the geotechnical activities; Temporary Occupancy which would be limited to staging, geotechnical drilling, and seismic surveys.

The Phase 2B activities are anticipated to affect existing roads, an existing erosion feature, the California Coastal Trail, and the DeMartin Campground.

Temporary impacts from the project include:

- Vegetation clearing and road grading: Vegetation clearing is required on access roads, boring locations, and along seismic refraction survey lines. In addition, grading is required at spot locations on access roads and trails.
- Trail/campground closure: Geotechnical investigations and restoration activities are anticipated to take 6-8 weeks between September 15, 2020 and January 31, 2021, and would require temporary closure of the DeMartin Campground, a portion of the Coastal Trail, and boring hole access roads.

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- Visual: A failing erosional scar would require the installation of a rock dissipation structure, which may change the visual nature of this spot location.
- Noise: Though helicopters are not required to reach sites within RNP, they are required to access the adjacent State Park land, and have the potential to disrupt the peace and quiet of the Park for short periods of time

Details on these temporary impacts are included below and in the sections that follow.

Seven boring and four seismic refraction survey line locations are within lands owned by the National Park Service. The locations would be accessed via existing trails and access roads. Minor vegetation clearing and trail/road grading would be required at spot locations; however, to minimize the temporary impacts, a rubber track rig (less than 6 feet wide) would be used. Given this, road and trail widths would only need to be 6 feet wide. As a result, except for one trail segment that would require grading up to 36 inches, all other segments needing grading would be limited to 24 inches (see attached Phase 2B Detailed Layouts). For the boring locations, a conservative estimate of area needed is 50 feet by 50 feet; however, depending on site logistics, the actual area needed is anticipated to be smaller.

National Park Service Access

To access NPS land, Caltrans would use three existing roads and create one new access point that is located within an erosional feature adjacent to Caltrans right of way. All four access points connect directly to Highway 101.

Boring locations B-23 and B-24 would be accessed from two of the existing roads. These boring locations are near Highway 101. No vegetation removal or grading is proposed along these roads or at the two boring locations.

The third existing road acts as an access road to the DeMartin Campground. There is one boring location on the road (B-26), and a short segment of the road would need to be graded.

These roads would be unavailable for public use during all geotechnical investigation activities in this area. However, it is unknown how many park visitors use the existing roads. Given they are not identified as official Park access points or trail heads and that access is limited by highway logistics (narrow, winding, high speed, limited site distance), it is anticipated that there will be minimal to no use of these roads by the public, especially in the fall and winter months when geotechnical activities would occur.

Boring location B-22 is located upslope from Highway 101. To create access, grading and filling of an existing erosional scar (up to 15 feet deep) is proposed. Given ongoing slope failure and instability issues, this location has been identified as needing slope protection; therefore, after the boring activities have been completed a rock dissipation structure would be constructed to prevent future erosion. Because it is a failing erosional scar, there would be no anticipated use of this location by Park visitors. The rock dissipation structure would add a different visual element to this location; however, the structure would be designed to be in character with the surrounding environment and take similar features along the highway into consideration. In addition, due to its location, views by park visitors would be limited.

Of the four seismic refraction surveys, three of the lines, seismic lines 9, 10, and 11, are near Highway 101, and would be accessed by hiking in from the highway. The remaining line, Seismic line 23, is partly located within the DeMartin Campground, starting at the boring B-19 location then

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traveling east into Green Diamond land. Seismic line surveys would take 2 days each to complete, and may require vegetation removal, which would consist of limited trimming of ground-level undergrowth in an up to 4-foot-wide strip (enough to lay out the equipment). No seismic line surveys are planned on the Coastal Trail. Except for Seismic line 23, the seismic lines are in areas where RNP visitors do not use.

Coastal Trail and DeMartin Campground

The Coastal Trail would be accessed via an existing NPS road. Seven segments would need to be graded along the Trail. Two boring locations (B-20 and B-25) are within the footprint of the trail and are located south of the DeMartin Campground. Along the Trail there is one location needing grading that would require the removal of up to three alder trees that are 16-inch diameter at breast height (dbh). The Trail would be unavailable for public use during all geotechnical investigation activities in this area.

The DeMartin Campground would be accessed via the Coastal Trail. Boring location B-19 and seismic line 23 would be located within the campground but not within individual camp sites. The campground would be unavailable for public use during all geotechnical investigation in this area.

Given the Trail and campground would be closed, Park visitors would not have views of the work areas until after construction activities are completed. Noticeable changes to the visual environment would include bare areas from vegetation clearing or removal that would stand out when compared with the rest of the trail and the campground. The standpipe monitors and/or slope indicators would be ground level and have low visibility, and therefore would not detract from views of the area. Visual impacts would be temporary because disturbed areas would be restored, and vegetation is anticipated to grow back within 6 months to 12 months.

As previously mentioned, helicopters would not be used within National Park Service land; however, helicopters would be used to access sites within the adjacent the State Park. Depending on the flight path, helicopter noise has the potential to disrupt the peace and quiet of the Park for short periods of time. All flights would be during daytime hours; however, given the few numbers of trips and the short duration of the flights, the noise is anticipated to result in only minor short-term disruptions to the quiet surroundings to which Park users are accustomed. The helicopters are expected to be in use in late September and October. Park users would be notified of the geotechnical investigation activities, including helicopter use.

There would be no long-term noise or visual impacts because of the geotechnical investigations.

Avoidance and Minimization Measures

The following measures would be included as part of the Phase 2B investigation:

- 1) Signage would be posted at trailheads and campgrounds, and information would be posted on websites at the beginning of the year to notify hikers and campers of the construction activities (including helicopter use) and potential closure of the trail and campground.
- 2) Selected large ferns in disturbance areas would be removed and transplanted.
- 3) Any cut/fill areas and access roads would be restored to a natural contour. Once completed, all restoration work would be inspected and approved by NPS.
- 4) Materials that blend in the with the surrounding environment would be used for restoring disturbed soil areas. This may include duff, wood mulch, etc.

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- 5) Plants of unique character would be salvaged from work areas and transplanted.
- 6) If soils become compacted in previously undisturbed areas, measures would be taken to uncompact soils to encourage the regeneration of vegetation.
- 7) A rubber track rig (less than 6 feet wide) would be used to minimize disturbance within the park. At the direction of NPS, gravel and/or rubber mats would be used to ensure the track rig does not negatively impact the road, coastal trail, or bore locations.
- 8) Work windows would avoid the nesting season for protected birds, including the marbled murrelet.
- 9) Prior to installation, NPS would review and comment on the proposed rock dissipation structure located at Bore Location B-22.

De Minimis Finding

There would be no Permanent Incorporation of Park land and no Constructive Use associated with the proposed Phase 2B geotechnical investigation activities.

The geotechnical investigations would require the temporary use of Redwood National Park. The temporary impacts would be limited to approximately 0.50 acre of the total 71,715 acres of the Park. Closure of the Coastal Trail and DeMartin Campground for up to 6-8 weeks would temporarily affect the recreational activities in this part of the park. The closure would occur after the peak backcountry camping months of July and August but would still affect visitors seeking backcountry camping experiences in September and October. Besides the temporary closure of the trail and campground, impacts would be limited to vegetation removal, road/trail surface disturbance, and helicopter noise on the adjacent State Park land. Disturbed sites would be restored, with regrowth anticipated to take between 6 to 12 months. Roads would be graded and restored to conditions prior to implementation of the project. If necessary, Caltrans would undertake all measures necessary to ensure that access roads damaged by the project would be protected from winter surface erosion. In addition, the standpipe monitor and/or slope indicator would remain in place for up to 2 years to allow for subsurface condition monitoring but would have low visibility.

Considering the scope of the work proposed, and after considering avoidance, minimization, and enhancement/restoration measures, there would be no adverse effect to the activities, features, or attributes that qualify the park for protection under Section 4(f). Therefore, the Temporary Occupancy during construction would constitute *de minimis* impacts under Section 4(f).

Public Input and Concurrence

As part of the Section 4(f) process, the public was afforded the opportunity to comment on this evaluation and Caltrans' intent to make a *de minimis* finding for the proposed geotechnical investigation activities within Redwood National Park. This letter served as the Section 4(f) evaluation and was circulated to the public as an attachment to the California Environmental Quality Act (CEQA) Initial Study with proposed Negative Declaration (IS/ND) from December 3, 2019 through January 3, 2020.

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Thank you for your cooperation in this matter. If you have any questions, please feel free to contact me at (707) 441-5615 or by email at steven.croteau@dot.ca.gov

Please sign below to indicate Redwood National Park's concurrence with Caltrans' *de minimis* finding for the LCG Phase 2B Geotechnical Study.

Steve Mietz, Superintendent, Redwood National Park

Date

Sincerely,

Steve Croteau
Senior Environmental Planner
North Region Environmental

Attachment: Figure 1.
 Figure 2.
 Phase 2B Layouts

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DEPARTMENT OF TRANSPORTATION

NORTH REGION ENVIRONMENTAL
DISTRICT 1, PO BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-5615
FAX (707) 441-5775
TTY 711



*Making Conservation
a California Way of Life.*

January 25, 2020

Mr. Victor Bjelajac
North Coast Redwoods District Superintendent
P.O. Box 2006
Eureka, CA 95502-2006

**Re: Section 4(f) *de minimis* concurrence for Phase 2B Geotechnical Study for the Last
Change Grade Project**

Dear Mr. Bjelajac:

The California Department of Transportation (Caltrans) and the Federal Highway Administration (FHWA) propose to conduct geotechnical studies to obtain information needed to develop a long-term solution to the instability and potential roadway failure of a portion of U.S. Highway 101 (Highway 101) between Post Miles (PM) 12.0 and 15.5 at "Last Chance Grade" (LCG) in Del Norte County. The geotechnical study (also known as Phase 2B) would include investigations within portions of Redwood National Park (RNP) and Del Norte Coast Redwoods State Park (DNCRSP) (see attached Figures 1 and 2, and Phase 2B Detailed Layouts). Under Section 4(f) of the Department of Transportation Act of 1996, both Parks are considered Section 4(f) resources. Therefore, a Section 4(f) analysis must be conducted, a determination made, and Park concurrence obtained.

The purpose of the study is to characterize the geology within the project area. The characterization would occur through the analysis of soil and rock samples, groundwater data, and measurements of slope movement. The information is needed to be able to evaluate and identify geotechnically critical sites, such as bridge abutments and tunnel portals.

To conduct the studies, minor vegetation clearing, material staging, drilling of boreholes, installation of standpipe piezometers or slope indicators (SI), and seismic refraction line activities would be required. All activities would be temporary in nature; no Permanent Incorporation of Park land is proposed, and no Constructive Use is anticipated.

This letter is to inform you of Caltrans' intent to make a *de minimis* finding for the impacts to DNCRSP. The following pages provide detailed information related to Section 4(f) and Section 4(f) resources, and geotechnical investigation activities. Through this letter Caltrans is seeking concurrence from State Parks for activities within DNCRSP; Caltrans is seeking concurrence separately from the National Park Service (NPS) for the activities that would occur within RNP.

DESCRIPTION OF SECTION 4(f)

Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 that established the requirement for consideration of park and recreation lands, wildlife and waterfowl refuges, and historic sites during transportation project development. The law, now codified in 49 U.S.C. Section 303 and 23 U.S.C. Section 138, applies only to the U.S. Department of Transportation (U.S. DOT) and is implemented by the Federal Highway Administration (FHWA)

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through the regulation 23 Code of Federal Regulations (CFR) 774. Section 4(f) applies to projects that receive funding from or require approval by an agency of the U.S. DOT. Responsibility for compliance with Section 4(f) has been assigned to Caltrans pursuant to 23 USC 326 and 327, including *de minimis* impact determinations.

There are three types of “use” under Section 4(f):

- 1) Permanent Incorporation – when a Section 4(f) resource is acquired outright for a transportation project.
- 2) Temporary Occupancy – when there is temporary use of resource that is adverse in terms of Section 4(f)'s preservationist purpose. Temporary occupancy is not a Section 4(f) use if all of the following conditions exist:
 - a. The land use is of short duration (defined as less than the time needed for the construction of the project)
 - b. There is no change in ownership of the land
 - c. The scope of the work must be minor
 - d. There are no temporary or permanent adverse changes to the activities, features, or attributes of the resource
 - e. The land must be fully restored to a condition at least as good as prior to the project
 - f. There must be documented agreement from the official(s) with jurisdiction over the resource with the above conditions
- 3) Constructive Use – when the proximity impacts of a transportation project on a Section 4(f) resource, even without acquisition of the resource, are so great that the activities, features and attributes of the resource are substantially impaired.

Before approving a project that uses a Section 4(f) resource, a determination must be made that either:

- 1) There is no feasible and prudent alternative that avoids the resource, and that the project includes all possible planning to minimize harm to the resource, or
- 2) The project would have a *de minimis* impact on the resource.

A *de minimis* impact is one that would not adversely affect the activities, features, or attributes of the Section 4(f) resource, and, subsequently, would not require an analysis of feasible and prudent avoidance alternatives.

A determination of *de minimis* impact may be made when all three of the following criteria are satisfied:

- 1) The transportation use of the Section 4(f) resource, together with any impact avoidance, minimization, and mitigation or enhancement measures incorporated into the project, does not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f);
- 2) The public has been afforded an opportunity to review and comment on the effects of the project on the protected activities, features, and attributes of the Section 4(f) resource; and
- 3) The official(s) with jurisdiction over the resource are informed of Caltrans' intent to make the *de minimis* impact determination based on their written concurrence that the project

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would not adversely affect the activities, features, and attributes that qualify the resource for protection under Section 4(f).

PROJECT DESCRIPTION

The Phase 2B geotechnical investigation will support the Last Chance Grade Permanent Restoration Project, which proposes to develop a permanent solution to the instability and potential roadway failure at LCG. The purpose of the investigation is to characterize the geology within the project area and along potential roadway alignments. The characterization would occur through the analysis of soil and rock samples, groundwater data, and measurements of slope movement. The information is needed to evaluate and identify geotechnically critical sites, including locations of potential bridge abutments and tunnel portals.

The proposed Phase 2B geotechnical investigation would include 15 boring locations (with two alternative sites [B-30B and B-34B] under consideration) and 14 seismic refraction line surveys. Of these, only 4 boring (with two alternative sites) and 9 seismic refraction line locations would be located within DNCRSP. The remaining locations would be within RNP or on Green Diamond Resource Company land. All boring locations (including the two alternative sites) within State Parks would be accessed by helicopter, and the seismic refraction line survey locations would be accessed by foot (no road access, road development, or road creation would occur within State Park land). Please see Figures 1 and 2, and the Phase 2B Detailed Layouts for the boring and seismic survey line locations.

Boring Locations within Del Norte Coast Redwoods State Park

Due to thick vegetation, topography, and other access limitations, equipment would be delivered to boring locations B-28, B-29, B-30A, and B-34A by helicopter. The locations were chosen based on the amount of naturally open canopy. Locations B-30B and B-34B are alternative sites for locations B-30A and B-34A. The alternative sites are near the proposed B-30A and B-34A boring locations and would only be used if they were determined to be safer and easier to access. This determination would be made by the helicopter pilot once geotechnical staging activities begin. Once the equipment is delivered, the drilling team would access the locations by foot from Highway 101. Light vegetation trimming may be required to create a pathway to the sites.

Helicopter and Drilling Equipment

A helicopter would be used to deliver the equipment. The helicopter is anticipated to be an AS350 Airbus, which has a maximum load capacity of 1,400 pounds and is considered to have low noise and down-draft compared to other helicopters. The equipment would be attached to a 100- to 200-foot-long cable and be delivered by being lowered to each bore location. Staging of equipment would occur outside of State Park land, and at no time would the helicopter land on State Park property.

The equipment needed for the investigation includes a drilling platform, drill rig equipped with a Standard Penetration Test (SPT) hammer, and steel drums. Portable ground protection mats may be used to protect soft ground surfaces. As a construction best management practice (BMP), plastic sheeting and straw wattle would be used to contain any drilling fluid.

The drilling platform would be a prefabricated modular steel platform, approximately 20 by 20 feet wide, and would be supported by up to eight legs, each requiring approximately 2 feet by 2 feet of cleared vegetation to ensure flat contact with the ground. Besides the leg locations, the vegetation trimming for the platform location would only require the trimming of vegetation to 6 inches above

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ground level. It is anticipated that each bore location would require approximately 12 helicopter trips, taking approximately 1.5 hours, to deliver all the equipment. Additional helicopter flights would likely be required to resupply the sites.

The SPT is an in situ dynamic penetration test designed to provide geotechnical engineering properties of the soil. The test uses a thick-walled split-spoon sample tube approximately 25.6 inches long with an outside diameter of 2 inches and inside diameter of 1.4 inches. This tube would be driven into the ground by a 140-pound slide hammer freefalling 30 inches. The tube would be driven 18-inches into the ground or until hammer refusal. Table 1 summarizes noise levels typically produced by a Mobile B-47 drill rig equipped with an SPT hammer during both drilling and SPT operations.

Given their location, the borehole locations are assumed to have ambient noise levels that are “natural” (up to 50 dB) to “very low” (51–60 dB). Drilling would not be expected to exceed 79 dB in areas where “natural ambient” noise levels are < 50. Helicopter noise levels are considered “very high” (91–100 dB) to “extreme” (101–110 dB) (U.S. Fish and Wildlife Service 2006)ⁱ.

Table 1: Summary of Drilling Noise Study Results

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

A helicopter flight plan would be developed by the contractor and associated authorities to minimize wildlife harassment and safety risks as the helicopter travels to the drill sites. Due to weather conditions and anticipated environmental work windows, the ideal timing of the helicopter operation would occur between September and October.

Caltrans anticipates that each boring would take approximately 1 week to complete.

Drilling Procedure

To obtain quality soil and rock samples at the depths needed, a mud rotary drilling system would be required for the borings. Borings would be 4.75 inches in diameter and would extend approximately 100 feet below ground surface (bgs). The system requires 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 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-millimeter drill rod, and mud tank. The mud tank would be positioned on the ground surface adjacent to the drill rig and would serve as a settling tank for soil cuttings. The cuttings would be removed periodically and placed in 55-gallon steel drums, which would be transferred to a fenced staging area.

ⁱ U.S. Fish and Wildlife Service. 2006. *Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California*. U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office. Arcata, California.

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Standpipe monitoring wells or slope indicators may be installed in the boring excavations; these would be monitored periodically for up to 2 years before being destroyed in accordance with the Del Norte County Environmental Health Division's requirements. Holes receiving a monitoring well would be flushed with clean water before a slotted PVC standpipe is installed and the annular space filled with clean #8 sand. The hole would be sealed with bentonite plugs to prevent infiltration of surface water or migration of water between aquifers. During drilling, the drill crew and geologist/engineer onsite would monitor for any leaks or spills of drilling fluid. If drilling fluid were to leak, the drill crew would immediately contain the escaping fluid and clean the impacted area.

Seismic Surveys

Seismic refraction line surveys are conducted to help characterize the subsurface conditions, estimate the depth to rock, and evaluate rip-ability of proposed excavations. The surveys would be performed on foot. Vegetation removal would consist of limited trimming of ground-level undergrowth in up to a 4-foot-wide strip (enough to lay out the equipment).

The survey lines would be between 200 and 600 feet long and would take approximately 2 days to complete. The surveys involve placing 24 small geophones (seismic sensors) on the ground in a straight line at equal spacing. The geophones have a 1-inch long prong that is pressed into the ground (usually by foot) to hold the geophone firmly so that shock waves are transmitted to the potentiometers inside the geophone. The geophones transmit a signal to a seismograph unit by a specialized cable. Shock waves would be created by slamming a 12- to 16-pound human-powered sledgehammer against a striker plate placed on at least seven different locations along the refraction line. The striker plate consists of an 8-inch square and a 0.75-inch thick steel plate or high-density polyethylene (HDPE). The noise from the hammer striking the metal plate is estimated at 108 dB at 9.8 feet (3 meters) and is approximately 85 dB at 50 feet (15 meters).

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 provide insufficient energy to cover the entire survey line, a shock-producing device involving a down-hole shotgun would be used. The down-hole shotgun uses an industrial shell fired in a minimum 1.5-foot deep water-filled hole created by a hand auger. The industrial shell is an 8-gauge 350- to 500-grain blank shotgun cartridge. Shells are triggered approximately 20 minutes apart. Shotgun detonations may leave an area of disturbed earth up to 2 feet in diameter. Disturbed soil would be tamped down to return it to its original condition. Detonation of the shells occurs below ground and usually does not pose a fire hazard, but fire suppression equipment would be 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.

Anticipated Schedule

Phase 2B drilling and seismic survey activities are anticipated to occur between September 15, 2020 and January 31, 2021. Because it poses minimal potential disruption to highway traffic, work would be conducted during the day. If needed, drilling time restrictions would be observed at certain locations to minimize potential disturbance to nearby resources.

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Post Exploration Clean-Up Operations

After the completion of each 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 be shoveled or sponged up and disposed of in 55-gallon drums. If additional water is needed to clean surfaces to prevent contamination of future storm-water or impacts to public safety, a minimal amount would be used and as much of the dirty water captured as practical. Any areas of ground disturbance created during drilling activities would be treated with appropriate BMPs to prevent erosion and stormwater pollution. Borings that do not receive a monitoring pipe would be backfilled using neat cement grout placed at the base of the excavation by tremmy.

DESCRIPTION OF THE SECTION 4(F) RESOURCE

The National Park Service and California State Parks jointly manage Redwood National and State Parks, which totals 133,000 acres of land and includes Redwood National Park (RNP), Del Norte Coast Redwoods State Park (DNCRSP), Jedediah Smith Redwoods State Park, and Prairie Creek Redwoods State Park. These four parks are recognized by the United Nations as a World Heritage Site and an International Biosphere Reserve.

Redwood National and State Parks offer various recreational activities such as fishing, hiking, and camping and beach access. Various trails provide bike, equestrian, and pedestrian access. There are various picnic areas, scenic drives and overlooks, wildlife watching locations, and tide pools. The Parks also host a section of the California Coastal Trail, a network of trails that, once completed, will span California, from Oregon to Mexico. In the project vicinity, the Parks are accessed from Highway 101 and is open every day and year-round.

DNCRSP was established in 1927. By 2002, the park had an area of 31,000 acres, making it California's fifth largest state park. The park extends from the Pacific Ocean to the west, through old-growth redwood forests and into Mill Creek Basin and the west fork of Mill Creek.

Redwood National and State Parks have multiple developed and undeveloped backcountry campgrounds. In the project vicinity, the closest developed campground is the Mill Creek Campground which is located approximately 4.5 miles north of the project limits and is within DNCRSP. The campground offers 143 sites (without hookups) and is open from May through September each year. The closest undeveloped backcountry campground is the DeMartin Campground, which is located within RNP and is within the project limits. The campground has 10 campsites and can be accessed from DNCRSP by foot along the Coastal Trail.

USE OF SECTION 4(F) RESOURCE

There would be no Permanent Incorporation or Constructive Use impacts associated with the geotechnical activities; Temporary Occupancy would be limited to staging, geotechnical drilling, and seismic surveys.

Four boring (including two alternative sites) and nine seismic refraction survey line locations are within lands owned by the State Park. The boring locations would be accessed by helicopter and by foot, and the seismic survey line locations would be accessed by foot. The boring locations are conservatively estimated to need 50 feet by 50 feet for operations; however, depending on site logistics, the actual area needed is anticipated to be smaller.

Details on the temporary impacts are included below and in the sections that follow.

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Helicopter Access

For the initial set-up, the boring locations would be accessed by helicopter. The locations were chosen based on the amount of naturally open canopy. Tree removal and limbing would be avoided to the extent feasible, and approved by CDPR before removal. At location B-30B, clearing of some small (less than 6-inch diameter at breast height [dbh]) redwoods would be necessary. It is anticipated that one 30-inch dbh alder tree would be removed at both B-34A and B-34B, and that limbs would need to be cut from one side of an approximately 18-inch dbh redwood tree at B-34A. The helicopter boring sites are not located in areas Park visitors use.

Once the equipment is delivered, the drilling team would access the locations by foot from Highway 101 using access routes approved by CDPR. Light vegetation trimming may be required to create a pathway to the sites. Vegetation at boring sites (up to 50'x50') may be cleared initially.

Seismic Refraction Survey Line Access

Nine seismic refraction lines surveys would occur within State Park land. Seismic lines 11, 12, 13, 14, 15, 16, and 17 are near Highway 101 and would be accessed by foot from the highway. Lines 18 and 21 straddle the State Park/Green Diamond property line and would be accessed by foot from existing Green Diamond roads. All access routes would be approved by CDPR prior to use. Seismic line surveys would take 2 days each to complete. Vegetation removal may be needed to complete the seismic line surveys and would consist of limited vegetation trimming of ground-level undergrowth in an up to 4-foot-wide strip (enough to lay out the equipment). No seismic line surveys are planned on the Coastal Trail. The seismic lines are not located in areas Park visitors use.

Coastal Trail and DeMartin Campground

The activities associated with the Coastal Trail and the DeMartin campground are located entirely within NPS land; however, the Trail portion within NPS and the campground can be accessed by the State Park's section of the Trail. As a result, the temporary closure of the Trail and Campground may temporarily alter public use of the trail within DNCRSP.

Though the tree and vegetation removal for helicopter access and seismic refraction survey lines would not be visible by the public on State Park land. Visitors may note changes in the visual environment in RNP along the Coastal Trail and within the DeMartin Campground, including bare areas and potential erosion from vegetation clearing or removal and installation of standpipe monitors and/or slope indicators. However, visual impacts would be temporary because disturbed areas would be restored, and vegetation is anticipated to grow back within 6 to 12 months. In addition, standpipe monitors and/or slope indicators would have low visibility as they would be at the ground level.

Depending on the flight path, helicopter noise has the potential to disrupt the peace and quiet of the both DNCRSP and RNP for short periods of time. All flights would be during daytime hours; however, given the short duration of the flights, the noise is anticipated to result in only minor short-term disruptions to the quiet surroundings to which Park users are accustomed. The helicopters are expected to be in use in late September and October, which is after the high-use peak periods of the summer months. Additionally, park users would be notified of the geotechnical investigation activities, including helicopter use.

There would be no long-term noise or visual impacts because of the geotechnical investigations.

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Avoidance and Minimization Measures

The following measures would be included as part of the Phase 2B investigation:

- 1) Signage would be posted at trailheads and campground, and information would be posted on websites at the beginning of the year to notify hikers and campers of the construction activities (including helicopter use).
- 2) Materials that blend in with the surrounding environment would be used for restoration measures of disturbed soil areas. This may include duff, wood mulch, etc.
- 3) Plants of unique character would be salvaged where removal is expected to occur and transplanted.
- 4) If soils become compacted in previously undisturbed areas, measures would be taken to uncompact soils to encourage the regeneration of vegetation.
- 5) Work windows would avoid the nesting season for protected birds, including the marbled murrelet.
- 6) Caltrans would document all disturbed areas, including boring locations, seismic survey lines and foot trails, and coordinate with State Parks to ensure that Parks lands are fully restored to a condition at least as good as prior to the project, and in accordance with Park requirements and restoration guidelines.

De Minimis Finding

There would be no Permanent Incorporation of Park land and no Constructive Use associated with the proposed Phase 2B geotechnical investigation activities.

The geotechnical investigations would require the temporary use of Del Norte Coast Redwoods State Park. The impacts would be limited to approximately 0.44 acre of the total 31,261 acres of the park, and would include vegetation removal, helicopter noise, and the temporary closure of the Coastal Trail and DeMartin Campground within adjacent NPS land. All sites would be restored, with regrowth anticipated to take between 6 to 12 months. In addition, the standpipe monitor and/or slope indicator would remain in place for up to 2 years to allow for subsurface condition monitoring.

Considering the scope of the work proposed, and after considering avoidance, minimization, and enhancement/restoration measures, there would be no adverse effect to the activities, features, or attributes that qualify the park for protection under Section 4(f). Therefore, the Temporary Occupancy during geotechnical investigations would constitute *de minimis* impacts under Section 4(f).

Public Input and Concurrence

As part of the Section 4(f) process, the public was afforded the opportunity to comment on this evaluation and Caltrans' intent to make a *de minimis* finding for the proposed geotechnical investigation activities within Del Norte Coast Redwoods State Park. This letter served as the Section 4(f) evaluation and was circulated to the public as an attachment to the California Environmental Quality Act (CEQA) Initial Study with proposed Negative Declaration (IS/ND) from December 3, 2019 through January 3, 2020.

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Victor Bjelajac, North Coast Redwoods District Superintendent
Re: Last Chance Grade Phase 2B Geotechnical Drilling
Project 01-0F280
January 25, 2020
Page 9

Thank you for your cooperation in this matter. If you have any questions, please feel free to contact me at (707) 441-5615 or by email at steven.croteau@dot.ca.gov

Please sign below to indicate State Park's concurrence with Caltrans' *de minimis* finding for the LCG Phase 2B Geotechnical Study.

Victor Bjelajac, Superintendent, North Coast Redwoods District

Date

Sincerely,

Steve Croteau
Senior Environmental Planner
North Region Environmental

Attachment: Figure 1.
Figure 2.
Phase 2B layouts

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Appendix E. SHPO Concurrence Letters





**DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION**

Lisa Ann L. Mangat, Director

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

November 5, 2019

VIA EMAIL

In reply refer to: FHWA_2019_1015_002

Ms. Jody L. Brown, Office Chief
Cultural Studies Office
Division of Environmental Analysis
Caltrans
PO Box 942873, MS-27
Sacramento, CA 94273-0001

Subject: Determinations of Eligibility for the Proposed Last Chance Grade Phase 2B
Geotechnical Investigations Project, Del Norte County, CA

Dear Ms. Brown:

Caltrans, as assigned by the Federal Highway Administration, is initiating consultation regarding the above project in accordance with Section 106 of the National Historic Preservation Act and implementing regulations codified at 36 CFR Part 800. As part of your documentation, Caltrans submitted a Historic Property Survey Report (HPSR), Historical Resources Evaluation Report, and an Archaeological Survey Report for the proposed project.

Caltrans District 1 proposes to develop a long-term solution to the instability and potential roadway failure at Last Chance Grade by constructing a new alignment. The existing alignment requiring replacement is located between PM 13.3 and 15.9 on US Highway 101 in Del Norte County, CA. There are currently several alternative alignments under consideration. Prior to completion of the design of alternative alignments, geotechnical studies are required to determine the depth and stability of soils and geological formations within the project area. A detailed description of the project and area of potential effect is located on pages 1-6 of the HPSR for the project.

As part of its identification efforts Caltrans determined that the Crescent City to Trinidad Wagon Road is eligible for the National Register of Historic Places (NRHP). Thirteen segments of the wagon road were identified for the purposes of this undertaking. Caltrans also determined that segments 1, 10, 11, and 13 retain historic integrity and are contributing elements of this resource. In addition Segments 2 through 9 and 12 do not retain historic integrity and are non-contributing elements to the wagon road.

Ms. Brown
November 5, 2019
Page 2 of 2

FHWA_2019_1015_002

Caltrans has also determined that the Road Grade and Drainage Ditch, located adjacent to and up the slope from the 1930s alignment of the Redwood Highway (modern highway), is not eligible for the NRHP.

Pursuant to 36 CFR 800.4(a-c), Caltrans is requesting SHPO concurrence on the following:

- 1) Adequacy of the delineation of the APE
- 2) Adequacy of the identification effort
- 3) Adequacy of the evaluation of potential historic properties for eligibility to the NRHP.

I have reviewed the documentation furnished and have the following comments:

- 1) I have no comment with regards to the delineation of the APE.
- 2) With regards to the Crescent City to Trinity Wagon Road, I do not have enough information at this time to either agree or disagree with Caltrans' determination of eligibility for the NRHP. I recommend that Caltrans treat the property as eligible for the purposes of the project. For segments with compromised integrity, Caltrans can take these factors into account as part of the effects analysis.
- 3) I concur that the Road Grade and Drainage Ditch, located adjacent to and up the slope from the 1930s alignment of the Redwood Highway (modern highway), is not eligible for the NRHP.
- 4) I have no further comment regarding the identification effort.

If you have any questions, please contact Natalie Lindquist at (916) 445-7014 with e-mail at natalie.lindquist@parks.ca.gov.

Sincerely,



Julianne Polanco
State Historic Preservation Officer

DEPARTMENT OF TRANSPORTATION

DIVISION OF ENVIRONMENTAL ANALYSIS (MS 27)
1120 N STREET
P.O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE: (916) 654-3467
FAX: (916) 653-7757
TTY: (916) 653-4086



*Make Conservation a
California Way of Life!*

October 14, 2019

Ms. Julianne Polanco
State Historic Preservation Officer
1725 23rd Street, Suite 100
Sacramento, CA 95816

Attn: Natalie Lindquist

**Re: Determination of Eligibility for the Last Chance Grade Phase 2B
Geotechnical Investigations Project, Del Norte County, California**

Dear Ms. Polanco:

The Department of Transportation (Caltrans), as assigned by the Federal Highway Administration (FHWA), is initiating consultation with the State Historic Preservation Officer (SHPO) regarding the Last Chance Grade Phase 2B Geotechnical Investigations Project on US Highway 101, in Del Norte County, California.

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S.C. 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans. At the request of project stakeholder National Park Service, the *Caltrans First Amended Section 106 Programmatic Agreement* (January 2014) will not be utilized for this undertaking. Consultation will therefore occur under National Historic Preservation Act implementing regulations at 36 CFR § 800.

Caltrans, District 1, is proposing to develop a long-term solution to the instability and potential roadway failure at Last Chance Grade (LCG) by constructing a new alignment. The existing alignment requiring replacement is located between post miles (PM) 13.3 and 15.9 on US highway 101 in Del Norte County, California. There are currently several alternative alignments under consideration. Prior to the completion of the design of alternative alignments,

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geotechnical studies are required to determine the depth and stability of soils and geological formations within the project area.

The proposed Phase 2B geotechnical investigations will include geotechnical borings at 16 locations and 14 seismic line surveys. The purpose of the exploration activities is to characterize sites in terms of depth to stable rock and rock properties, and to confirm the presence and activity of landslide features. Based on the materials encountered and the geotechnical design criteria desired, select soil samples will be obtained from borings for laboratory analysis. Pursuant to 36 CFR 800.3(g), Caltrans is requesting SHPO consultation on the appropriateness of the Area of Potential Effect (APE), the adequacy of historic property identification efforts, and determinations of eligibility for this undertaking.

In an effort to identify and evaluate historic properties, Caltrans has completed and attached the *Historic Property Survey Report for the Last Chance Grade Phase 2B Geotechnical Investigation Project in Del Norte County, 01-DN-101 Post Mile 13.3-22.58* (HPSR), which contains information on the project and describes our efforts to identify and evaluate cultural resources. The HPSR can be referred to for additional information on the current undertaking. Project effects on historic properties will be discussed in a forthcoming Finding of Effects document.

As a result of archival research, record searches, archaeological surveys, and a Historical Resource Evaluation study, Caltrans has determined that two cultural resources within the APE require evaluation.

Caltrans has determined the following resource is **eligible** for listing in the National Register of Historic Places (NRHP) and is requesting your concurrence on eligibility:

- The **Crescent City to Trinidad Wagon Road** is the first north-south access route along the northern California coastline. Thirteen segments of the wagon road were identified and recorded for the purposes of this undertaking. Segments 1, 10, 11 and 13 retain historical integrity and are therefore contributing elements of this resource. Segments 2 through 9 and 12 do not retain historical integrity and are non-contributing elements to the wagon road.

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Ms. Polanco
Last Chance Grade Phase 2B Geotechnical Investigations
October 14, 2019
Page 3

Caltrans has determined the following resource is **ineligible** for listing in the National Register of Historic Places (NRHP) and is requesting your concurrence on eligibility:

- A **Road Grade and Drainage Ditch** is located adjacent to and up the slope from the 1930's alignment of the Redwood Highway (modern highway). The s-shaped alignment appears to be an abandoned road associated with a drainage ditch constructed by the Division of Highways in the 1930's.

Caltrans' requests your concurrence regarding the adequacy of the following:

- Delineation of the Area of Potential Effects (APE) for the undertaking;
- Identification of potential historic properties located within the undertaking's APE
- Evaluation of potential historic properties for eligibility to the National Register of Historic Places (NRHP)

Thank you for your assistance in providing a safe, sustainable, integrated, and efficient transportation system to enhance California's economy and livability. If you require any additional information or have any questions or concerns please do not hesitate to contact me or Caltrans archaeologists Stacey Zolnoski at (707) 441-5855 or at Stacey.Zolnoski@dot.ca.gov, or Timothy Keefe at (707) 441-2022 or at Timothy.Keefe@dot.ca.gov, or Caltrans architectural historian Douglas Bright at (510) 286-5350 or at Douglas.Bright@dot.ca.gov.

Sincerely,



JODY L. BROWN
Office Chief
Cultural Studies Office

Enclosures:

*Historic Property Survey Report for the Last Chance Grade Phase 2B
Geotechnical Investigations, Del Norte County, California*

*"Provide a safe, sustainable, integrated and efficient transportation
system to enhance California's economy and livability"*

Ms. Polanco
Last Chance Grade Phase 2B Geotechnical Investigations
October 14, 2019
Page 4

Copy: Timothy Keefe; Caltrans, District 1
Douglas Bright; Caltrans, District 4
Alex Neeb, Caltrans, Cultural Studies Office
Karin Grantham, Redwood National Park
Greg Collins; California State Parks, North Coast Redwoods District
Joe James and Rosie Clayburn; Yurok Tribe
Denise Padgett and Amanda O'Connell; Tolowa Dee-ni' Nation
Charlene Storr; Tolowa Nation
Dale Miller and Crista Stewart; Elk Valley Rancheria
Fawn Murphy; Resighini Rancheria

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**OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION**

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calshpo@parks.ca.gov
www.ohp.parks.ca.gov



May 15, 2014

Reply To: FHWA_2014_0320_001

Steve Croteau, Chief
Environmental Services Branch E1
Caltrans District 1
PO Box 3700
Eureka, CA 95502-3700

Re: Determination of Eligibility for the Proposed Storm Damage Permanent Restoration Project
on Route 1, Del Norte County, CA

Dear Mr. Croteau:

You are consulting with me about the subject undertaking in accordance with 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, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

In 2001, Caltrans staff determined the Redwood Highway met the criteria for inclusion in the National Register of Historic Places (NRHP) pursuant to PRC 5024 under Criterion C as the design of a master landscape architect, an engineering achievement, and for its aesthetic qualities. In 2004, Caltrans sought and received concurrence from the SHPO for this determination.

Due to the passage of time and the discovery of new information, Caltrans reevaluated the Redwood Highway. Caltrans has now determined that the Redwood Highway is not eligible for the NRHP. Additionally as a state-owned resource, pursuant to PRC 5024(b), Caltrans has determined that the Redwood Highway does not meet California Historical Landmark eligibility criteria and should not be considered a historical resource for the purposes of CEQA. Based on my review of the submitted documentation, I concur.

Thank you for considering historic properties during project planning. If you have any questions, please contact Natalie Lindquist of my staff at (916) 445-7014 or email at natalie.lindquist@parks.ca.gov or Michelle Messinger at (916)445-7005 or e-mail at michelle.messinger@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

DEPARTMENT OF TRANSPORTATION

DISTRICT 1, P.O. BOX 3700
EUREKA, CA 95502-3700
PHONE (707) 441-5615
FAX (707) 441-5775
TTY 711



*Flex your power!
Be energy efficient!*

March 12, 2014

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer
1725 23rd Street, Suite 100
Sacramento, CA 95816

US Route 101/DN/PM 15.1-15.14
Storm Damage Permanent Repair
EA: 01-0B270/EFIS: 0112000111

Re: Historic Property Survey Report and Determination of Eligibility for the
Storm Damage Permanent Restoration Project on Route 101, Del Norte County – Section 106 and
PRC 5024 Compliance

Dear Dr. Roland-Nawi:

The California Department of Transportation (Caltrans) and Federal Highway Administration propose to repair US Route 101 within Del Norte Coast Redwoods State Park Bridge from post mile (PM) 15.1 to 15.14 in Del Norte County. The project is necessary because of substantial damage caused by winter storms in 2010 that caused a loss of a portion of the southbound traffic lane. A full project description can be found on pages one through two of the enclosed HPSR and a depiction of the Area of Potential Effects (APE) is attached to it (Attachment A). Caltrans is initiating consultation on this project in accordance with 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, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (PA).

Enclosed you will find a Historic Property Survey Report (HPSR) for the proposed undertaking with attached Historic Resources Evaluation Report (HRER). We are consulting with you at the present time under Stipulations VIII.C.6 of the PA, which requires that we seek your concurrence on Caltrans' determinations of eligibility for potential historic properties.

Caltrans is transmitting this study as a federal agency, following the provisions of 23 USC 326 and the *Memorandum of Understanding (MOU) between the Federal Highway Administration, California Division and the California Department of Transportation State Assumption of Responsibility for Categorical Exclusions*, which became effective on June 7, 2007, and was renewed on June 7, 2010. Please direct all future correspondence on this project to Caltrans.

Consultation and identification efforts for this project resulted in the identification of one previously recorded cultural resource within the APE:

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Dr. Carol Roland-Nawi
March 6, 2014
Page 2 of 2

- Redwood Highway through Del Norte Coast Redwoods State Park (Redwood Highway hereafter), PM 13.3-22.58

No other cultural resources are within the APE.

In 2001, Caltrans staff determined the Redwood Highway met the criteria for inclusion in the National Register of Historic Places (NRHP) pursuant to PRC 5024. It was determined to be a landscape district at the state level of significance under Criterion C as the design of a master landscape architect, an engineering achievement, and for its aesthetic qualities. In 2004, Caltrans sought and received formal concurrence from SHPO for this determination.

Due to the passage of time and the discovery of new information, Caltrans has reevaluated the Redwood Highway. Under Stipulation VIII.C.5 of the PA, Caltrans has concluded the previous determination is not valid and, pursuant to Stipulation VIII.C.6, is requesting your concurrence that the Redwood Highway is **not eligible** for listing in the NRHP. Additionally, as a state-owned resource, pursuant to PRC 5024(b), Caltrans requests your concurrence that it does not meet the California Historical Landmark eligibility criteria. Caltrans has also determined the Redwood Highway is not a historical resource for the purposes of CEQA.

We look forward to receiving your response within 30 days of receipt of this submittal in accordance with Stipulation VIII.C.6.a of the PA. Please contact Chris Kuzak, North Region Architectural Historian, at (530) 741-4017, if you have any questions regarding the documentation enclosed with this letter.

Sincerely,



Steven Croteau, Chief
Environmental Services Branch E1

Enclosure

cc: Michelle Messenger, OHP

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Appendix F. Biological Surveys – Species, Personnel, and Dates



Survey Date(s)	Survey Type	Personnel	Organization
March 26, 2019	Special-Status Animal Habitat Assessment	Christine Hamilton (biologist)	Caltrans
April 15, 2019	Botanical Survey	Jeff Barrett (botanist), Jon Lee (botanist)	Caltrans
April 16, 2019	Botanical Survey	Jeff Barrett (botanist), Amanda Lee (project coordinator), Christine Hamilton (biologist), Jon Lee (botanist)	Caltrans
April 17, 2019	Botanical Survey	Jeff Barrett (botanist), Amanda Lee (project coordinator), Jacob Hillard (botanist), Jon Lee (botanist)	Caltrans
April 18, 2019	Botanical Survey	Jeff Barrett (botanist), Felicia Zimmerman (project coordinator), Christine Hamilton (biologist), Jon Lee (botanist), Jacob Hillard (botanist)	Caltrans
April 19, 2019	Botanical Survey	Jeff Barrett (botanist), Amanda Lee (project coordinator), Christine Hamilton (biologist), Jacob Hillard (botanist)	Caltrans
April 26, 2019	Botanical Survey	Jeff Barrett (botanist), Amanda Lee (project coordinator), Felicia Zimmerman (project coordinator), Kellie Eldridge (botanist)	Caltrans
May 1, 2019	Botanical Survey	Jeff Barrett (botanist), Christine Hamilton (biologist), Jon Lee (botanist), Jacob Hillard (botanist)	Caltrans
May 2, 2019	Botanical Survey	Jeff Barrett (botanist), Amanda Lee (project coordinator), Jon Lee (botanist), Felicia Zimmerman,	Caltrans
May 3, 2019	Botanical Survey	Jeff Barrett (botanist), Amanda Lee (project coordinator), Christine Hamilton (biologist), Felicia Zimmerman (project coordinator)	Caltrans
May 15, 2019	Botanical Survey	Jeff Barrett (botanist), Christine Hamilton (biologist), Amanda Lee (project coordinator), Jon Lee (botanist)	Caltrans
May 16, 2019	Botanical Survey	Jeff Barrett (botanist), Christine Hamilton (biologist), Ali Thiel (biologist), Jon Lee (botanist)	Caltrans
May 22-24, 2019	Aquatic Resources Delineation	Jordan Mayor (wetland ecologist), Margaret Widdowson (botanist/wetland ecologist)	ICF
June 11-12, 2019	Botanical Survey	Jeff Barrett (botanist), Jon Lee (botanist), Jacob Hillard (botanist), Christine Hamilton (biologist)	Caltrans

Survey Date(s)	Survey Type	Personnel	Organization
June 13, 2019	Botanical Survey	Jeff Barrett (botanist), Jon Lee (botanist), Jacob Hillard (botanist),	Caltrans
June 19, 2019	Botanical Survey	Jeff Barrett (botanist), Jacob Hillard (botanist), Jon Lee (botanist), Kellie Eldridge (botanist)	Caltrans
June 23-26, 2019	Aquatic Resources Delineation	Jordan Mayor (wetland ecologist), Zach Larson (biologist)	ICF
July 17-18, 2019	Aquatic Resources Delineation	Jordan Mayor (wetland ecologist), Margaret Widdowson (botanist/wetland ecologist)	ICF
July 23-24, 2019	Botanical Survey	Jeff Barrett (botanist), Jon Lee (botanist), Jacob Hillard (botanist), Jeremy Pohlman (biologist)	Caltrans
July 25, 2019	Botanical Survey	Jeff Barrett (botanist), Jon Lee (botanist), Jeremy Pohlman (biologist), Felicia Zimmerman (project coordinator)	Caltrans
July 29, 2019	Botanical Survey	Jeff Barrett (botanist), Ali Thiel (biologist)	Caltrans
July 30, 2019	Botanical Survey	Jeff Barrett (botanist), Ali Thiel (biologist), Stacey Zolnoski (archaeologist)	Caltrans
July 31, 2019	Botanical Survey	Jeff Barrett (botanist), Ali Thiel (biologist), Kellie Eldridge (botanist)	Caltrans
October 8, 2019	Aquatic Resources Assessment	Robert Meade (senior biologist), Jeff Barrett (botanist), Kellie Eldridge (botanist)	Caltrans
October 25, 2019	Aquatic Resources Delineation	Jeff Barrett (botanist), Kellie Eldridge (botanist), Alexandra Thiel (biologist)	Caltrans

Appendix G. Special-Status Plant Species with the Potential to Occur in the Project Vicinity



Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
Sea-watch/ <i>Angelica lucida</i>	CRPR 4.2	Coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps (coastal salt). Occurs from 0 to 150 meters in elevation; blooms May–September.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
False gray horsehair lichen/ <i>Bryoria pseudocapillaris</i>	CRPR 3.2	Coastal dunes (San Luis Obispo County), North Coast coniferous forest (immediate coast). Occurs from 0 to 90 meters in elevation.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Twisted horsehair lichen/ <i>Bryoria spiralifera</i>	CRPR 4.2	North Coast coniferous forest. Occurs from 0 to 30 meters in elevation.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Bolander's reed grass/ <i>Calamagrostis bolanderi</i>	CRPR 4.2	Bogs and fens, broadleafed upland forest, closed-cone coniferous forest, coastal scrub, meadows and seeps (mesic), marshes and swamps (freshwater), North Coast coniferous forest. Occurs from 0 to 455 meters in elevation; blooms May–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Thurber's reed grass/ <i>Calamagrostis crassiglumis</i>	CRPR 2B.1	Coastal scrub, freshwater marsh, marsh and swamp, wetland. Occurs from 0 to 50 meters in elevation; blooms May–August.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Leafy reed grass/ <i>Calamagrostis foliosa</i>	SR, CRPR 4.2	Coastal bluff scrub, North Coast coniferous forest. Occurs from 0 to 1,220 meters in elevation; blooms May–September.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Spiral-spored gilded-head pin lichen/ <i>Calicium adpersum</i>	CRPR 2B.1	Lower montane coniferous forest, North Coast coniferous forest.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Seaside bittercress/ <i>Cardamine angulata</i>	CRPR 2B.1	Lower montane coniferous forest, North Coast coniferous forest, wetlands. Occurs from five to 915 meters in elevation; blooms January–July.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Northern clustered sedge/ <i>Carex arcta</i>	CRPR 2B.2	Bogs and fens, North Coast coniferous forest, Wetlands. Occurs from 60 to 1,400 meters in elevation; blooms June–September.	P	Low: Small amount of suitable habitat is present with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).

Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
Buxbaum's sedge <i>Carex buxbaumii</i>	CRPR 4.2	Bogs and fens, meadows and seeps, marshes and swamps.	P	Low: Minor amount of suitable habitat present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Bristle-stalked sedge <i>Carex leptalea</i>	CRPR 2B.2	Bogs and fens, freshwater marsh, marshes and swamps, meadows and seeps, wetlands.	P	Low: Minor amount of suitable habitat present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Northern meadow sedge <i>Carex praticola</i>	CRPR 2B.2	Meadows and seeps, wetlands.	P	Low: Minor amount of suitable habitat present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Green yellow sedge <i>Carex viridula</i> ssp. <i>viridula</i>	CRPR 2B.3	North Coast coniferous forests; bogs and fens, marshes and swamps, wetlands.	P	Low: Minor amount of suitable habitat at present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Nuttall's saxifrage/ <i>Cascadia nuttallii</i>	CRPR 2B.1	North Coast coniferous forest. Occurs from 35 to 80 meters in elevation; blooms in May.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Johnny-nip/ <i>Castilleja ambigua</i> ssp. <i>ambigua</i>	CRPR 4.2	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pool margins. Occurs from 0 to 435 meters in elevation; blooms March–August.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Oregon coast paintbrush <i>Castilleja litoralis</i>	CRPR 2B2	Coastal bluff scrub, coastal dunes, and coastal scrub.	P	Moderate: suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
Oregon coast paintbrush/ <i>Castilleja litoralis</i>	CRPR 2B.2	Coastal bluff scrub, coastal dunes, coastal scrub. Occurs from five to 255 meters in elevation; blooms June–July.	P	Moderate: suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
Pacific golden- saxifrage/ <i>Chrysosplenium</i> <i>glechomifolium</i>	CRPR 4.3	North Coast coniferous forest, riparian forest. Occurs from 10 to 455 meters in elevation.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.

Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
Oregon goldthread/ <i>Coptis laciniata</i>	CRPR 4.2	Meadows and seeps, North Coast coniferous forest (streambanks). Occurs from 0 to 1,000 meters in elevation; blooms February–November.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Naked flag moss/ <i>Discelium nudum</i>	CRPR 2B.2	Coastal bluff scrub (soil, on clay banks). Occurs from 10 to 50 meters in elevation.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Black crowberry/ <i>Empetrum nigrum</i>	CRPR 2B.2	Coastal bluff scrub, coastal prairie. Occurs from 3 to 200 meters in elevation; blooms April–June.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Del Norte buckwheat/ <i>Eriogonum nudum</i> var. <i>paralinum</i>	CRPR 2B.2	Coastal bluff scrub, coastal prairie. Occurs from five to 80 meters in elevation; blooms June–September.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Coast fawn lily/ <i>Erythronium revolutum</i>	CRPR 2B.2	Bogs and fens, broadleafed upland forest, North Coast coniferous forest. Occurs from 0 to 1,600 meters in elevation; blooms March–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Minute pocket moss/ <i>Fissidens pauperculus</i>	CRPR 1B.2	North Coast coniferous forest (damp coastal soil). Occurs from 10 to 1,024 meters in elevation.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Pacific gilia/ <i>Gilia capitata</i> ssp. <i>pacifica</i>	CRPR 1B.2	Coastal bluff scrub, chaparral (openings), coastal prairie, valley and foothill grassland. Occurs from five to 1,665 meters in elevation; blooms April–August.	P	Low: Minor amount of suitable habitat is present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)
Harlequin lotus/ <i>Hosackia gracilis</i>	CRPR 4.2	Broadleafed upland forest, coastal bluff scrub, closed-cone coniferous forest, Cismontane woodland, coastal prairie, coastal scrub, meadows and seeps, marshes and swamps, North Coast coniferous forest, valley and foothill grassland (wetlands, roadsides). Occurs from 0 to 700 meters in elevation; blooms March–July.	P	Low: Minor amount of suitable habitat is present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County)

Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
California globe mallow/ <i>Iliamna latibracteata</i>	CRPR 1B.2	Chaparral (montane), lower montane coniferous forest, North Coast coniferous forest (mesic), riparian scrub (streambanks). Occurs from 60 to 2,000 meters in elevation; blooms June–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Thompson's iris/ <i>Iris thompsonii</i>	CRPR 4.3	Lower montane coniferous forest, North Coast coniferous forest. Occurs from 90 to 600 meters in elevation; blooms March–August.	P	Low: Small amount of suitable habitat is present, with a few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Small groundcone/ <i>Kopsiopsis hookeri</i>	CRPR 2B.3	North Coast coniferous forest. Occurs from 90 to 1,435 meters in elevation; blooms April–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Marsh pea/ <i>Lathyrus palustris</i>	CRPR 2B.2	Bogs and fens, coastal prairie, coastal scrub, lower montane coniferous forest, marshes and swamps, North Coast coniferous forest. Occurs from 1 to 140 meters in elevation; blooms March–August.	P	Low: Minor amount of suitable habitat is present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Kellogg's lily/ <i>Lilium kelloggii</i>	CRPR 4.3	Lower montane coniferous forest, North Coast coniferous forest. Occurs from 3 to 1,300 meters in elevation; blooms May–August.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Western lily/ <i>Lilium occidentale</i>	FE/SE/ CRPR 1B.1	Bogs and fens, coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps (freshwater), North Coast coniferous forest (openings). Occurs from 2 to 185 meters in elevation; blooms June– July.	P	Low: Minor amount of suitable habitat is present, or few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Vollmer's lily/ <i>Lilium pardalinum</i> ssp. <i>vollmeri</i>	CRPR 4.3	Bogs and fens, meadows and seeps (mesic). Occurs from 30 to 1,680 meters in elevation; blooms June–August.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Heart-leaved twayblade/ <i>Listera cordata</i>	CRPR 4.2	Bogs and fens, lower montane coniferous forest, North Coast coniferous forest. Occurs from five to 1,370 meters in elevation; blooms February–July.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.

Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
Coast Range lomatium/ <i>Lomatium martindalei</i>	CRPR 2B.3	Coastal bluff scrub, lower montane coniferous forest, meadows and seeps. Occurs from 240 to 3,000 meters in elevation; blooms May– August.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Inundated bog club- moss <i>Lycopodiella inundata</i>	CRPR 2B.2	Lower montane coniferous forests; bogs and fens, marshes and swamps.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Running-pine/ <i>Lycopodium clavatum</i>	CRPR 4.1	Lower montane coniferous forest (mesic), marshes and swamps, North Coast coniferous forest (mesic). Occurs from 45 to 1,225 meters in elevation; blooms June– September.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Leafy-stemmed miterwort/ <i>Mitellastra caulescens</i>	CRPR 4.2	Broadleafed upland forest, lower montane coniferous forest, meadows and seeps, North Coast coniferous forest. Occurs from five to 1,700 meters in elevation; blooms March–October.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Woodnymph/ <i>Moneses uniflora</i>	CRPR 2B.2	Broadleafed upland forest, North Coast coniferous forest. Occurs from 50-1,100 meters in elevation; blooms May–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Ghost-pipe/ <i>Monotropa uniflora</i>	CRPR 2B.2	Broadleafed upland forest, North Coast coniferous forest. Occurs from 10 to 855 meters in elevation; blooms June–September.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Howell's montia/ <i>Montia howellii</i>	CRPR 2B.2	Meadows and seeps, North Coast coniferous forest, vernal pools. Occurs from 0 to 1,215 meters in elevation; blooms January–May.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Wolf's evening- primrose/ <i>Oenothera wolfii</i>	CRPR 1B.1	Coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest. Occurs from 0- to 800 meters in elevation; blooms May–October.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Suksdorf's wood- sorrel/ <i>Oxalis suksdorfii</i>	CRPR 4.3	Broadleafed upland forest, North Coast coniferous forest. Occurs from 15 to 700 meters in elevation; blooms May–August.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.

Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
Seacoast ragwort/ <i>Packera bolanderi</i> var. <i>bolanderi</i>	CRPR 2B.2	Coastal scrub, North Coast coniferous forest. Occurs from 30 to 915 meters in elevation; blooms January–August.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
White-flowered rein orchid/ <i>Piperia candida</i>	CRPR 1B.2	Broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest. Occurs from 20 to 1,615 meters in elevation; blooms March– September.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
California pinefoot/ <i>Pityopus californicus</i>	CRPR 4.2	Broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest, upper montane coniferous forest. Occurs from 15 to 2,225 meters in elevation; blooms March–August.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Nodding semaphore grass/ <i>Pleuropogon</i> <i>refractus</i>	CRPR 4.2	Lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, riparian forest. Occurs from 0 to 1,600 meters in elevation; blooms March–August.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Oregon polemonium/ <i>Polemonium</i> <i>carneum</i>	CRPR 2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Occurs from 0 to 1,830 meters in elevation; blooms April–September.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Angel's hair lichen/ <i>Ramalina thrausta</i>	CRPR 2B.1	North Coast coniferous forest. Occurs from 75 to 430 meters in elevation.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Trailing black currant/ <i>Ribes laxiflorum</i>	CRPR 4.3	North Coast coniferous forest. Occurs from five to 1,395 meters in elevation; blooms March–August.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Great burnet/ <i>Sanguisorba</i> <i>officinalis</i>	CRPR 2B.2	Bogs and fens, broadleaved upland forest, marshes and swamps, meadows and seeps, North Coast coniferous forest, riparian forest, ultramafic, wetlands. Occurs from 60 to 1,400 meters in elevation; blooms July–October.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).

Common Name/ Scientific Name	Status ^a	Habitat Requirements and Blooming Period	Habitat Present/ Absent ^b	Rationale
Maple-leaved checkerbloom/ <i>Sidalcea malachroides</i>	CRPR 4.2	Broadleafed upland forest, coastal prairie, coastal scrub, North Coast coniferous forest, riparian woodland. Occurs from 0 to 765 meters in elevation; blooms March–August.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Siskiyou checkerbloom/ <i>Sidalcea malviflora</i> ssp. <i>patula</i>	CRPR 1B.2	Coastal bluff scrub, coastal prairie, North Coast coniferous forest. Occurs from five to 1,255 meters in elevation; blooms April–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Coast checkerbloom/ <i>Sidalcea oregana</i> ssp. <i>eximia</i>	CRPR 1B.2	Lower montane coniferous forest, meadows and seeps, North Coast coniferous forest, wetlands. Occurs from five to 1,805 meters in elevation; blooms June–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Scouler's catchfly/ <i>Silene scouleri</i> ssp. <i>scouleri</i>	CRPR 2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Occurs from 0 to 600 meters in elevation; blooms March–September.	P	Low: Small amount of suitable habitat is present, with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Trifoliate laceflower/ <i>Tiarella trifoliata</i> var. <i>trifoliata</i>	CRPR 3.2	Lower montane coniferous forest, North Coast coniferous forest (edges, moist shady banks, streambanks). Occurs from 170 to 1,500 meters in elevation; blooms May–August.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Cylindrical trichodon/ <i>Trichodon cylindricus</i>	CRPR 2B.2	Broadleafed upland forest, meadows and seeps, upper montane coniferous forest. Occurs from 50 to 2,002 meters in elevation.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Coastal triquetrella/ <i>Triquetrella californica</i>	CRPR 1B.2	Coastal bluff scrub, coastal scrub. Occurs from 10 to 100 meters in elevation.	P	Moderate: Suitable habitat is present, and occurrences are recorded from the region (coastal Del Norte County and northern coastal Humboldt County).
Methuselah's beard lichen/ <i>Usnea longissima</i>	CRPR 4.2	Broadleafed upland forest, North Coast coniferous forest. Occurs from 45 to 1,465 meters in elevation.	P	High: Suitable habitat is present, and occurrences are recorded within five miles of ESL.
Alpine marsh violet/ <i>Viola palustris</i>	CRPR 2B.2	Bogs and fens, coastal scrub, wetlands. Occurs from 0 to 150 meters in elevation; blooms March–August.	P	Low: Small amount of suitable habitat is present with few to no occurrences recorded from the region (coastal Del Norte County and northern coastal Humboldt County).

^a Status:

- FE = Federal Endangered.
- SE = State Endangered.
- SR = State Rare.

California Rare Plant Rank (CRPR)

- 1B = Rank 1B species: rare, threatened, or endangered in California and elsewhere.
- 2B = Rank 2B species: rare, threatened, or endangered in California but more common elsewhere.
- 3 = Review List: Plants about which more information is needed.
- 4 = Watch List: Plants of limited distribution.

Threat rank extensions:

- .1 = Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat).
- .2 = Moderately threatened in California (20%-80% occurrences threatened/ moderate degree and immediacy of threat).
- .3 = Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats).

^b Habitat Present/Absent:

- P = Present (species is present).
- HP = Habitat present (habitat is, or may be present).
- CH = Critical habitat present.

Appendix H. Special-Status Wildlife Species with Potential to Occur in the Project Vicinity



Common Name	Scientific Name	Status ^a	Habitat Requirements	Habitat Present/ Absent ^b	Rationale
Amphibians					
Pacific (coastal) tailed-frog	<i>Ascaphus truei</i>	SSC	Typically found in cold, clear, perennial rocky streams in wet forests, but may also utilize intermittent creeks. This species is not known to use ponds or lakes. This species may occur in uplands during precipitation events.	P	Intermittent streams mapped at or near SL-16, SL-21, B-16, B-20, B-35, and B-36 may provide aquatic habitat during winter and spring months when water is present.
Northern red-legged frog	<i>Rana aurora</i>	SSC	Humid forest, woodlands, grasslands, and stream sides in northwestern California, usually near dense riparian vegetation.	P	Intermittent streams mapped at or near SL-16, SL-21, B-16, B-20, B-35, and B-36 may provide aquatic habitat during winter and spring months when water is present. May occur in forested uplands during the wet season near these same locations.
Foothill yellow-legged frog	<i>Rana boylei</i>	SCT	Species occurs throughout the North and South Coast Ranges, south to the Transverse Range, across northern California to the west slope of the Cascade Range, and south through the foothills of the Sierra Nevada. Occurs up to 6,000 feet in the northern Sierra Nevada. Inhabits forest streams and rivers with sunny, sandy, and rocky banks, with deep pools, and shallow riffles. Occurs in both perennial and intermittent streams.	P	Intermittent streams mapped at or near SL-16, SL-21, B-16, B-20, B-35, and B-36 may provide aquatic habitat during winter and spring months when water is present.
Southern torrent salamander	<i>Rhyacotriton variegatus</i>	SSC	Occurs along the coast in cold and well-shaded perennial streams and seeps in hardwood and coniferous forests. Eggs are laid in flowing water and adults are typically found among moss-covered pebbles and rocks within or adjacent to flowing water.	P	Intermittent streams mapped at or near SL-16, SL-21, B-16, B-20, B-35, and B-36 may provide aquatic habitat during winter and spring months when water is present.
Reptiles					
Green sea turtle, East Pacific Distinct Population Segment (DPS)	<i>Chelonia mydas</i>	FT	Does not nest on beaches of northern California (NMFS and USFWS 2007); may occur in open water habitat off the coast line of Del Norte County.	A	No habitat in BSA.
Leatherback sea turtle	<i>Dermochelys coriacea</i>	FE	No known nesting sites on the coast of California (NMFS 2019); may occur in open water habitat off the coast of Del Norte County.	A	No habitat in BSA.
Western pond turtle	<i>Emys marmorata</i>	SSC	Occurs throughout California west of the Sierra-Cascade crest; found from sea level to 6,000 feet; does not occur in desert regions except along the Mojave River and its tributaries; occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms.	A	No habitat in BSA.
Olive ridley sea turtle	<i>Lepidochelys olivacea</i>	FE	Mainly pelagic in tropical/temperate regions of Pacific, South Atlantic, and Indian Oceans but has been known to inhabit coastal areas, including bays and estuaries.	A	No habitat in BSA.
Birds					

Common Name	Scientific Name	Status ^a	Habitat Requirements	Habitat Present/ Absent ^b	Rationale
Marbled murrelet	<i>Brachyramphus marmoratus</i>	FT/SE	Nests in old-growth coniferous forests, up to 6 miles inland, often in Douglas-fir. Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz.	P, CH	May occur in mature forested habitat within the BSA. Known from project vicinity. Some project locations within critical habitat.
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	FT/SSC	Coastal beaches, sandy areas near estuaries, salt ponds, river mouths, and levees along inland salt ponds. Nests on the ground, mainly in the open in sandy areas. The BSA is not within critical habitat for this species.	A	No foraging or nesting habitat in BSA.
Northern harrier	<i>Circus hudsonius</i>	SSC	Nests on the ground among herbaceous vegetation, such as grasses or cattails; forages in grasslands, agricultural fields, and marshes. Breeding range encompasses much of lowland California; winter range expands to include the remaining lowland areas.	A	No foraging or nesting habitat in BSA.
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	FT/SE	Prefers riparian woodlands composed of various compositions with a dense understory along slow-moving watercourses. Typically requires 25–99 acres of expansive riparian habitat for breeding.	A	No foraging or nesting habitat in BSA.
Black swift	<i>Cypseloides niger</i>	SSC	Colonial breeder on cliffs behind or adjacent to waterfalls and sea-bluffs above the surf; forages widely.	A	No foraging or nesting habitat in BSA.
White-tailed kite	<i>Elanus leucurus</i>	SFP	Forages in grasslands, meadows, or marshes. Nests in woodlands and mature riparian habitat types.	A	No foraging or nesting habitat in BSA.
Tufted puffin	<i>Fratercula cirrhata</i>	SSC	Feeds in the ocean; nests along the coast on islands, islets, and mainland cliffs.	A	No foraging or nesting habitat in BSA.
Bald eagle	<i>Haliaeetus leucocephalus</i>	FD/SE/S FP	Nests in large, old-growth, or dominant live trees. Nests typically located 50–200 feet above ground. Forages primarily in large inland fish-bearing waters with adjacent large trees or snags, and occasionally in uplands with abundant rabbits, other small mammals, or carrion.	A	Unlikely to occur in BSA; no foraging habitat and marginal nesting habitat.
Fork-tailed storm-petrel	<i>Oceanodroma furcata</i>	SSC	Colonial nester on islands. Forages over the open ocean.	A	No foraging or nesting habitat in BSA.
Short-tailed albatross	<i>Phoebastria (=Diomedea) albatrus</i>	FE/SSC	Pelagic species. Does not breed or nest in California; only known breeding sites in Western Pacific Ocean islands. During nonbreeding season, may occur in northern California along the shelf break of the continental shelf (USFWS 2008).	A	No foraging or nesting habitat in BSA.
Northern spotted owl	<i>Strix occidentalis caurina</i>	FT/ST	Mature old growth forests, conifers, wooded canyons; BSA is not within critical habitat for this species. Coniferous forests with a multilayered, multispecies canopy with moderate to high canopy closure; large snags (standing dead trees); an abundance of large, dead wood on the ground; and open space within and below the upper canopy to fly.	P	May occur in mature forested habitat within BSA. Known from project vicinity.

Common Name	Scientific Name	Status ^a	Habitat Requirements	Habitat Present/ Absent ^b	Rationale
Little willow flycatcher	<i>Empidonax Traillii brewsteri</i>	SE	Prefers mountain meadows and riparian habitats. Nests near the edges of vegetation clumps and near streams in mountain meadows and riparian habitats.	A	No foraging or nesting habitat in BSA.
Long-eared owl	<i>Asio otus</i>	SSC	Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.	A	No foraging or nesting habitat in BSA.
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	Summer resident; Most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	A	Species is a summer resident to the area and would not be present during project activities.
Peregrine falcon	<i>Falco peregrinus anatum</i>	SFP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, humanmade structures. Nest consists of a scrape or a depression or ledge in an open site.	A	No foraging or nesting habitat in BSA.
Purple martin	<i>Progne subis</i>	SSC	Summer resident; Inhabits woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine.	A	Species is a summer resident to the area and would not be present during project activities.
Vaux's swift	<i>Chaetura vauxi</i>	SSC	Summer resident; Redwood, Douglas-fir, & other coniferous forests. Nests in large hollow trees & snags. Often nests in flocks.	A	Species is a summer resident to the area and would not be present during project activities.
Yellow-breasted chat	<i>Icteria virens</i>	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses. Nests in low, dense riparian habitat, consisting of willow, blackberry, wild grape; forages and nests within 10 feet of ground.	A	No suitable habitat in BSA.
Yellow warbler	<i>Setophaga petechial</i>	SSC	Prefers riparian plant associations near water. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	A	No suitable habitat in BSA.
Mammals					
Ring-tailed cat	<i>Bassariscus astutus</i>	SFP	Coniferous forests and riparian areas in California. Inhabit rock crevices, tree hollows, and cliffs.	P	Suitable habitat in BSA.
Sonoma tree vole	<i>Arborimus pomo</i>	SSC	Occurs in old-growth and other forests, mainly Douglas-fir, redwood, and montane hardwood-conifer habitats.	P	Suitable habitat in BSA.
White-footed vole	<i>A. albipes</i>	SSC	In California, only known from Humboldt and Del Norte Counties. Found in coastal forests dominated by redwood, Douglas-fir, and also occurs in riparian forest cover types. Occupies habitat near small streams with dense alder and deciduous trees and shrubs.	P	Suitable habitat in BSA.
Sei whale	<i>Balaenoptera borealis</i>	FE	Worldwide cosmopolitan distribution in subtropical, temperate, and subpolar waters; usually observed in deeper waters of oceanic areas far from coastline.	A	No suitable habitat in BSA.

Common Name	Scientific Name	Status ^a	Habitat Requirements	Habitat Present/ Absent ^b	Rationale
Blue whale	<i>Balaenoptera musculus</i>	FE	Worldwide, often near the edges of physical features where krill tend to concentrate.	A	No suitable habitat in BSA.
Fin whale	<i>Balaenoptera physalus</i>	FE	Deep, offshore waters of all major oceans; less common in the tropics.	A	No suitable habitat in BSA.
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SSC	Primarily roosts in caves and cave-like roosting habitat, such as tunnels and mines. Very sensitive to disturbances and may abandon a roost after one onsite visit. Reported to use buildings in the northern and coastal portions of range. Also reported to use bridges (typically the cavernous spaces underneath) and hollow trees as roost sites. In California, occurs in inland deserts, moist cool redwood forests, oak woodlands of the inner Coast Ranges and Sierra Nevada foothills, and lower- to mid-elevation mixed coniferous forests.	P	Mature redwood trees with cavities may provide suitable roosting sites; may forage throughout the BSA.
North Pacific right whale	<i>Eubalaena japonica</i>	FE	North Pacific Ocean; seasonally migratory; colder waters for feeding, migrating to warmer waters for breeding and calving; may move far out to sea during feeding seasons but gives birth in coastal areas.	A	No suitable habitat present in BSA.
Humboldt marten	<i>Martes caurina humboldtensis</i>	FPT/SE	Coastal old-growth forests and serpentine areas.	P	Suitable habitat in BSA. Known from project vicinity.
Humpback whale	<i>Megaptera novaeangliae</i>	FT	All major oceans; central California population migrates from winter calving and mating areas off Mexico to summer and fall feeding areas off coastal California. Humpback whales occur from late April to early December.	A	No suitable habitat present in BSA.
Southern resident killer whale	<i>Orcinus orca</i>	FE	All oceans; most abundant in colder waters but also occurs in temperate water; presence and occurrence common but unpredictable in coastal California.	A	No suitable habitat present in BSA.
Fisher, West Coast DPS / Northern California Evolutionary Significant Unit (ESU)	<i>Pekania pennanti</i>	FPT/SSC	Requires forest with dense canopy and a complex structure that includes lots of down wood, moderate shrub cover, dead trees, and intermixed hardwood trees. Relies on dens created by large trees, snags, logs, rock piles, and root burrows.	P	Suitable habitat in BSA. Known from project vicinity.
Sperm whale	<i>Physeter catodon</i> [=microcephalus]	FE	Open ocean far from land and uncommon in waters less than 984 feet (300 meters) deep; live at surface of the ocean but dive deep to catch giant squid.	A	No suitable habitat present in BSA.
Fish					
Green sturgeon, southern DPS	<i>Acipenser medirostris</i>	FT	Marine and estuarine environments, Sacramento River; San Francisco Bay-Delta, Humboldt Bay, offshore waters to 110 meters (360 feet) from Monterey Bay to the United States-Canada border.	A	No suitable habitat present in BSA.

Common Name	Scientific Name	Status ^a	Habitat Requirements	Habitat Present/ Absent ^b	Rationale
Tidewater goby	<i>Eucyclogobius newberryi</i>	FE/SSC	Inhabits lagoons and estuaries with still or slow-moving water less than 3 feet deep. Salinity levels typically less than 12 parts per thousand, although they have been found in water with salinity from 0 to 42 parts per thousand, temperatures from 8 to 25degrees Celsius (°C) (46–77°F). Typically occurs over a sandy or mixed sandy/silty bottom with sparse vegetation.	A	No suitable habitat present in BSA.
Coho salmon, Southern Oregon/Northern California Coast ESU	<i>Oncorhynchus kisutch</i>	FT/ST	Found in perennial streams with water temperatures of 12–14°C. Not commonly found in streams where summer temperatures exceed 22–25°C. Requires deep pools, riffles, and runs with adequate canopy cover.	A	No suitable habitat present in BSA.
Chinook salmon, California Coastal ESU	<i>Oncorhynchus tshawytscha</i>	FT	Spends between 1 and 5 years in the ocean before returning to natal rivers to spawn. Typically enters freshwater river systems after large winter storm events. Spawns between October and December in the upper mainstems of rivers and the lower reaches of coastal creeks (Moyle et al. 2008) composed of a mixture of small cobble and large gravel.	A	No suitable habitat present in BSA.
Steelhead, Northern California DPS	<i>O. mykiss irideus</i>	FT, SCE	Live as adults in ocean habitats and migrate into rivers and streams to spawn (Moyle 2002). Steelhead spawn in gravel and small cobble substrates usually associated with riffle-and-run habitat types in coldwater streams.	A	No suitable habitat present in BSA.
Coast cutthroat trout	<i>O. clarkii</i>	SSC	Occupies coastal streams with some populations migrating to the ocean where they typically stay near the coastline and the mouths of larger rivers. In freshwater, found in small, low gradient streams and estuaries.	A	No suitable habitat present in BSA.
Steelhead, Klamath mountains province DPS	<i>O. mykiss irideus</i>	SSC	Spawns in gravel and small cobble substrates usually associated with riffle-and-run habitat types in coldwater streams.	A	No suitable habitat present in BSA.
Eulachon	<i>Thaleichthys pacificus</i>	FT	Spawns in lower reaches of rivers during peak spring flow events. Adults in the southern DPS are semelparous. Needs sand or coarse gravel for spawning substrate. Larvae are transported to estuaries and then to the ocean.	A	No suitable habitat present in BSA.
Invertebrates					
Oregon silverspot butterfly	<i>Speyeria zerene hippolyta</i>	FT	Found in marine terrace and coastal headland meadows, stabilized dunes, and montane grasslands found on Mount Hebo and Fairview Mountain in Oregon (USFWS 2001). Requires early blue violet (<i>Viola adunca</i>), the larval host plant and nectar plants for adult butterflies.	A	No suitable habitat present in BSA; BSA south of known range.

Common Name	Scientific Name	Status ^a	Habitat Requirements	Habitat Present/Absent ^b	Rationale
Western bumble bee	<i>Bombus occidentalis</i>	SCE	Primarily found in shrubland and grassland. Typically nests in underground abandoned rodent burrows or other cavities.	A	No suitable habitat present in BSA.

^a Status:

Federal

- FE = listed as endangered under the federal Endangered Species Act.
- FT = listed as threatened under the federal Endangered Species Act.
- FD = removed from federal Endangered Species Act list.
- FPT = Federally proposed threatened.

State

- ST = listed as threatened under the California Endangered Species Act.
- SFP = designated as a fully protected species under the CFGC.
- SCE = State candidate endangered.
- SCT = State candidate threatened.
- SSC = State species of special concern.

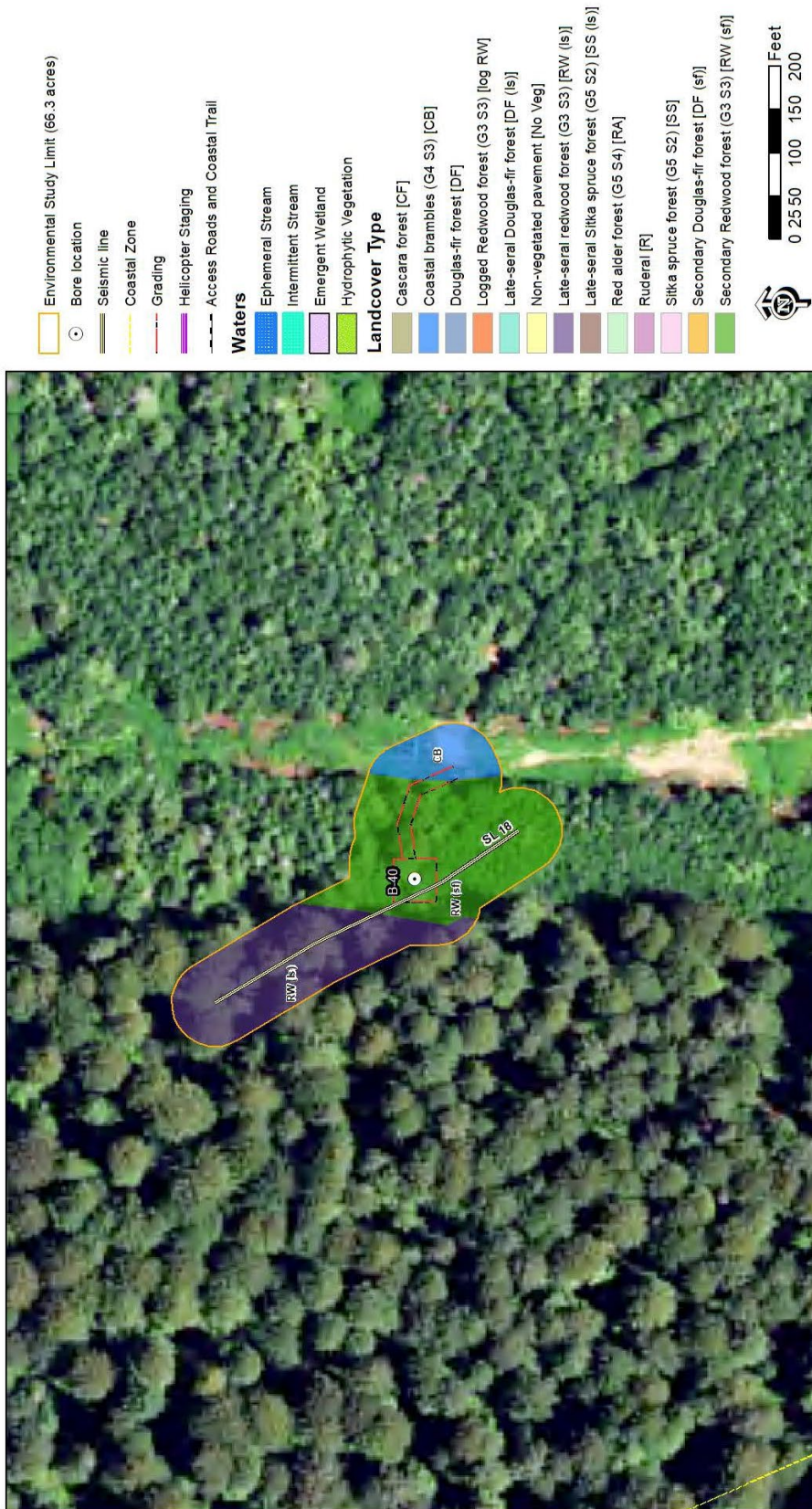
^b Habitat Present/Absent:

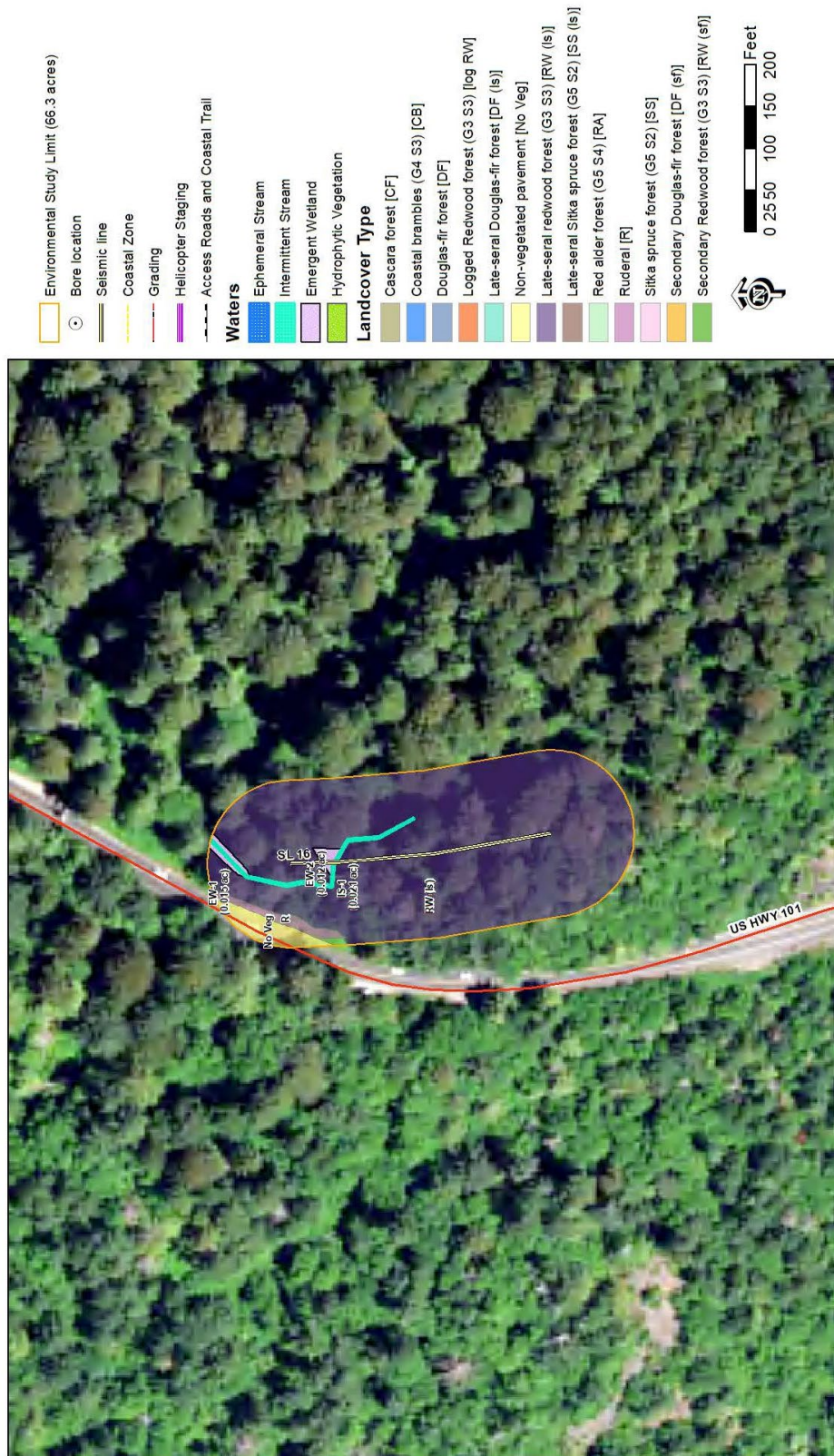
- A = absent (no habitat present).
- P = present (species is present).
- HP = habitat present (habitat is or may be present).
- CH = project footprint is in designated critical habitat.

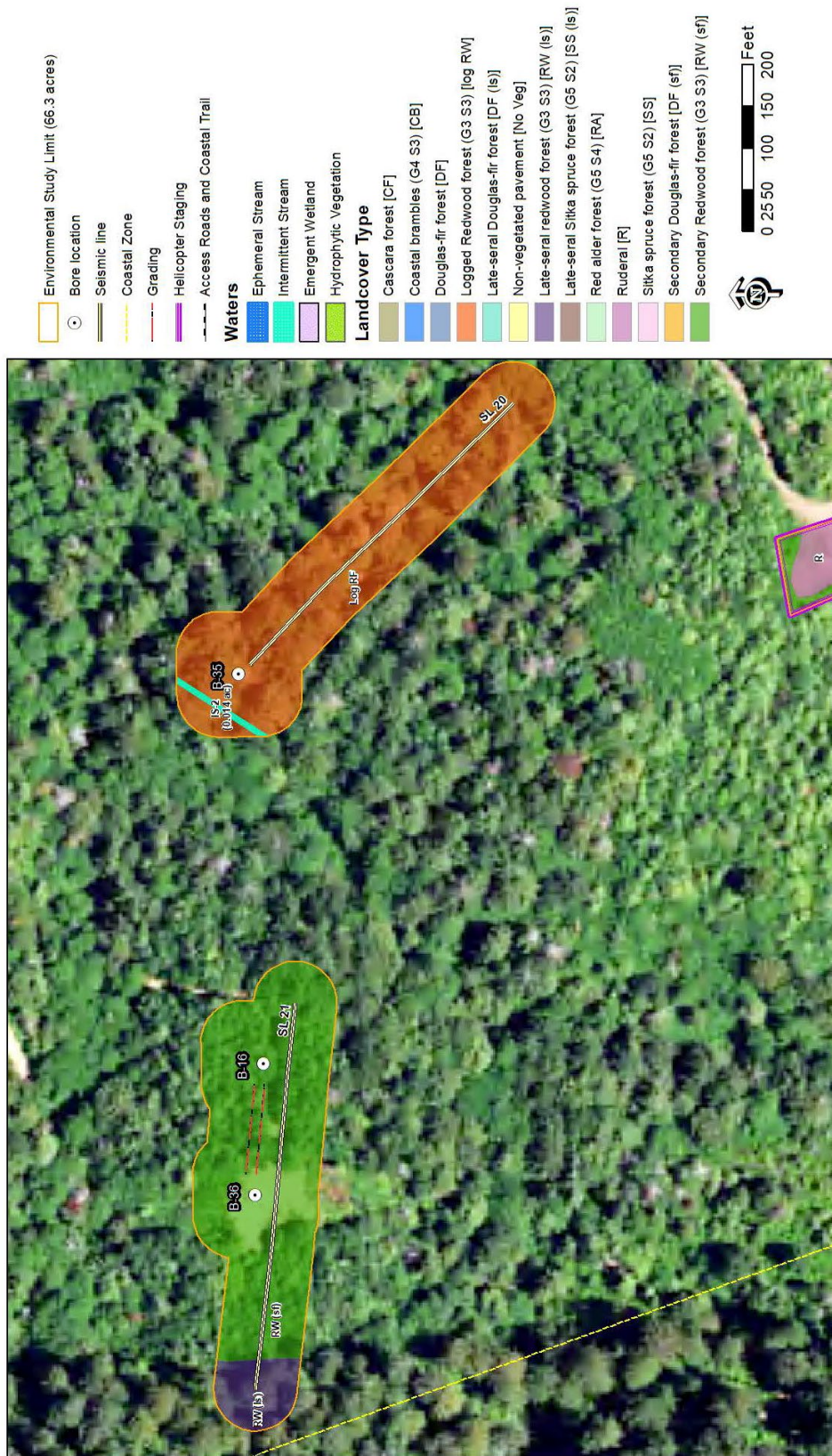
Appendix I. Wetland and Vegetation Mapping within the ESL



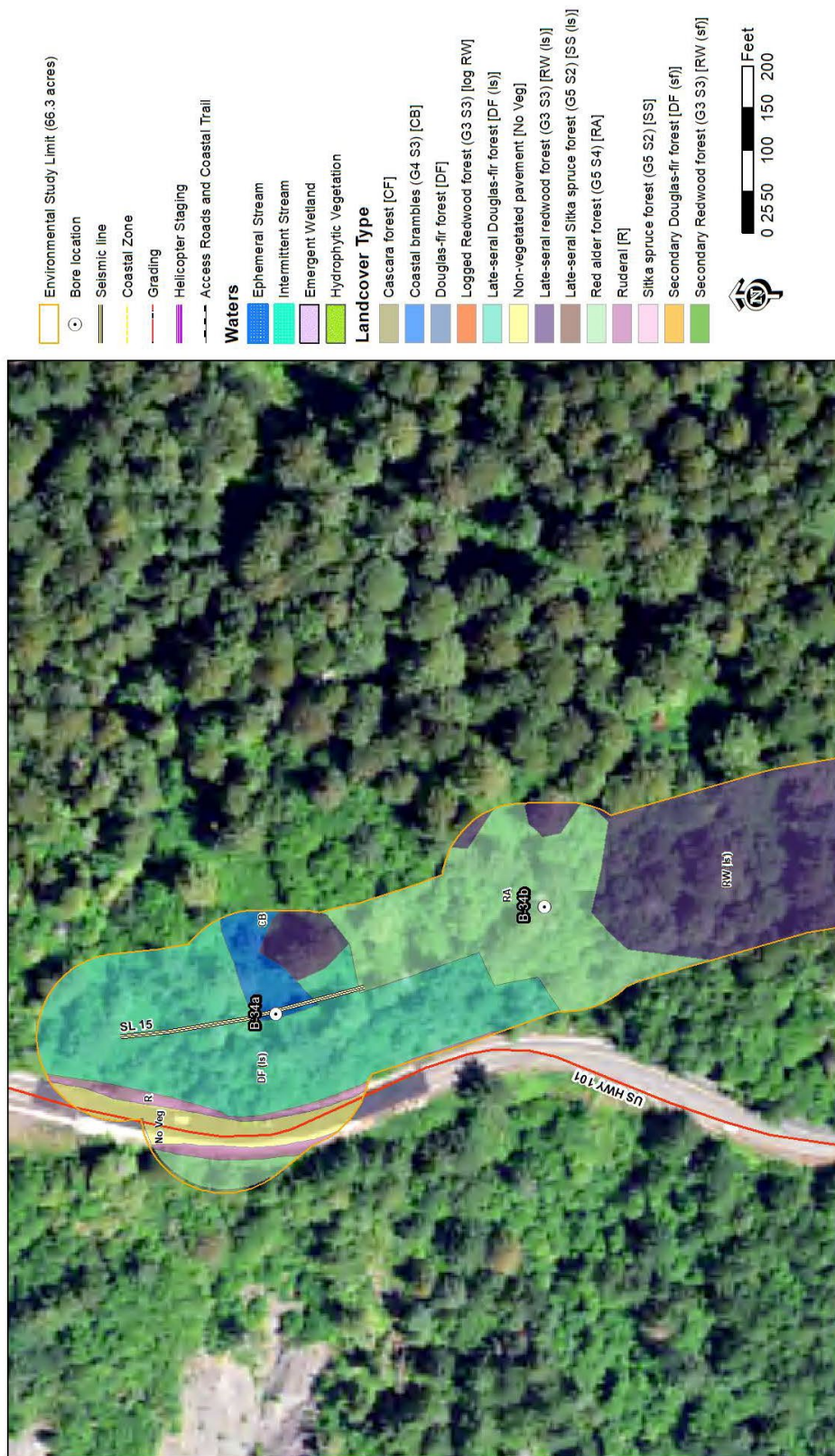


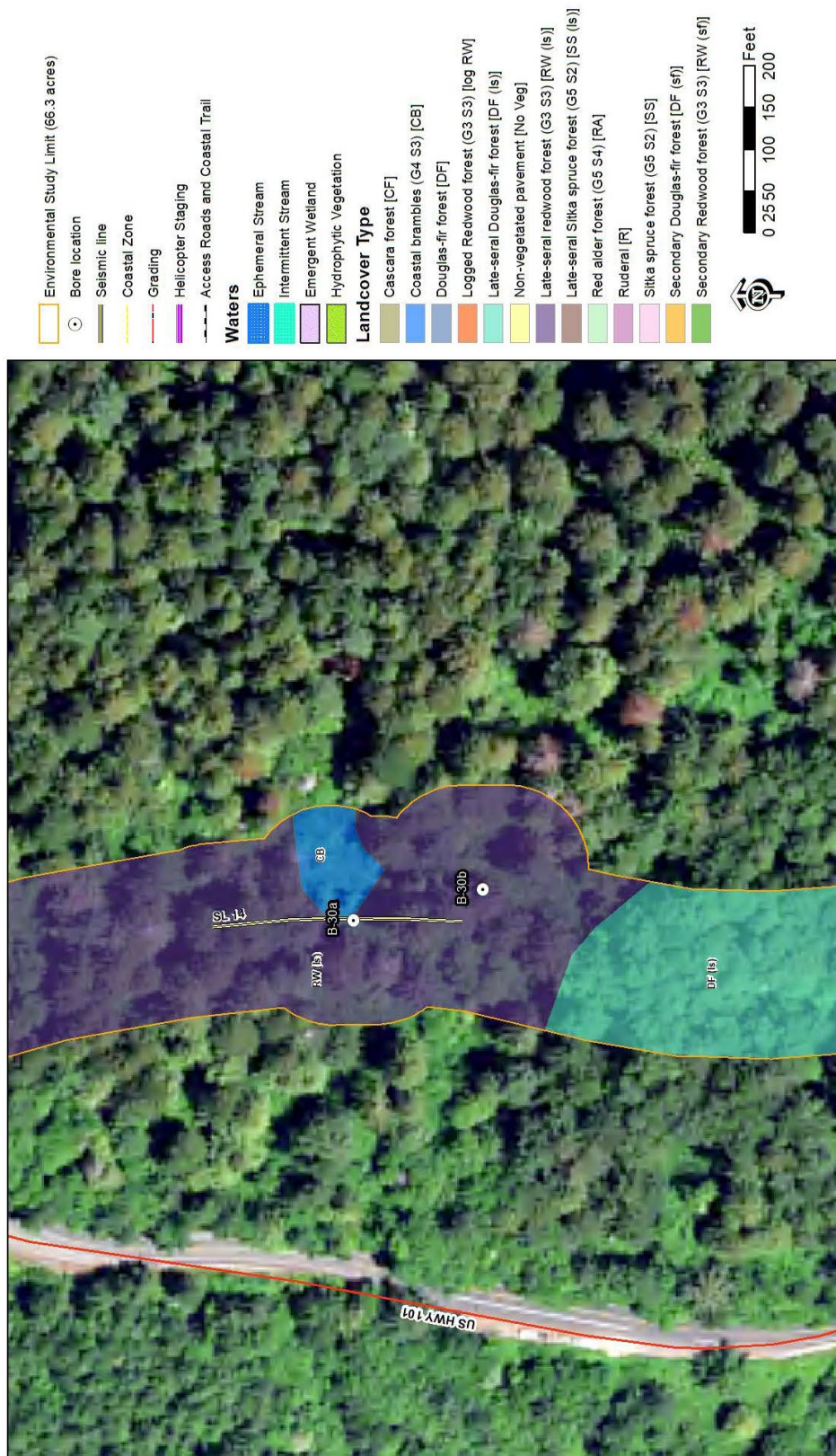


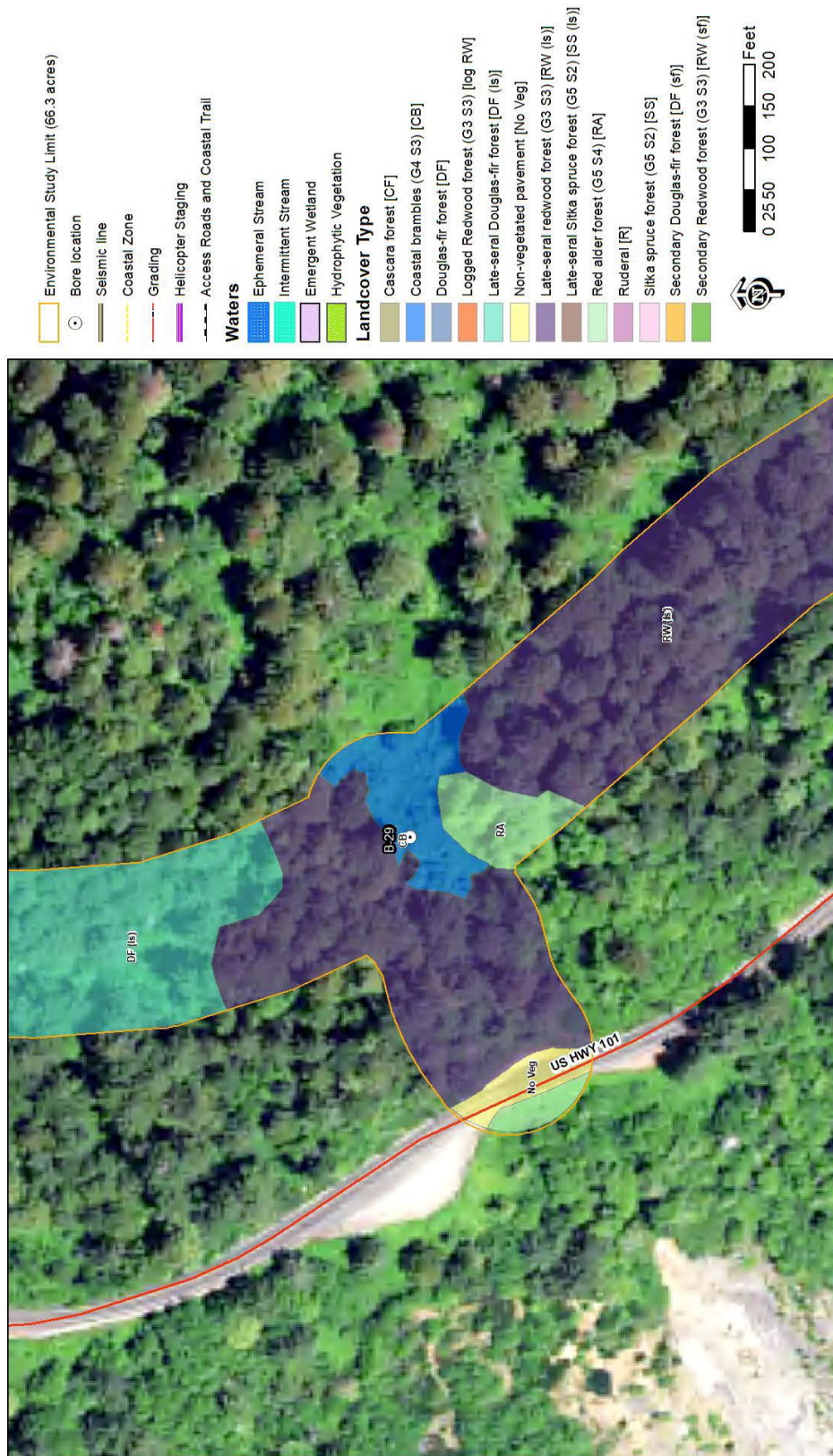


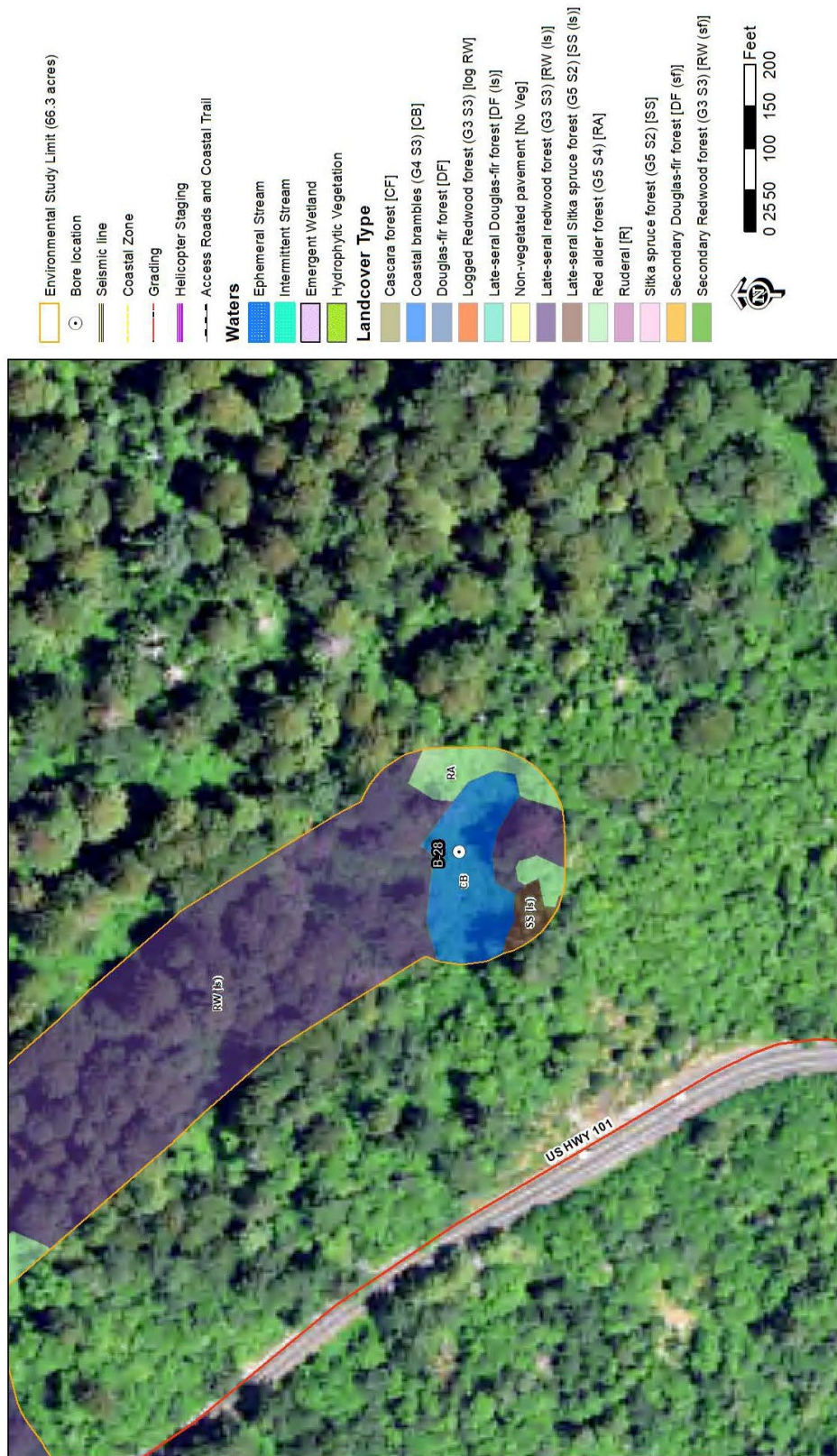


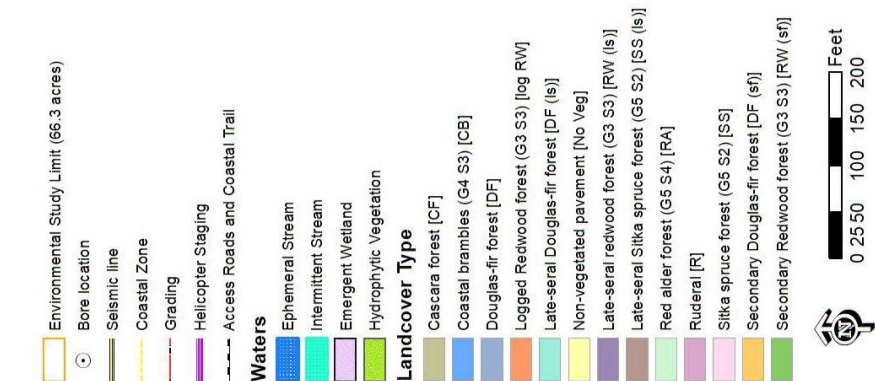


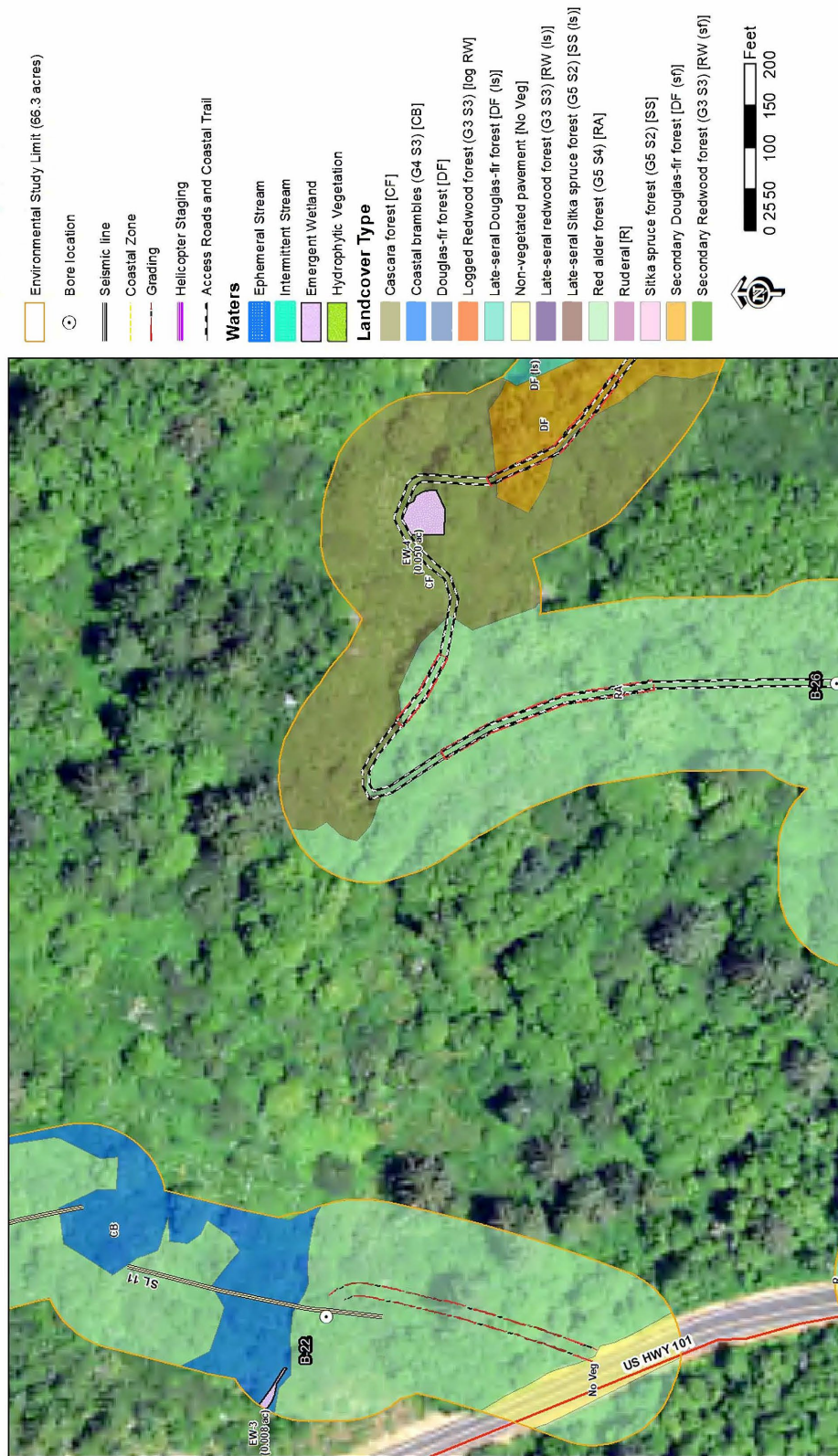


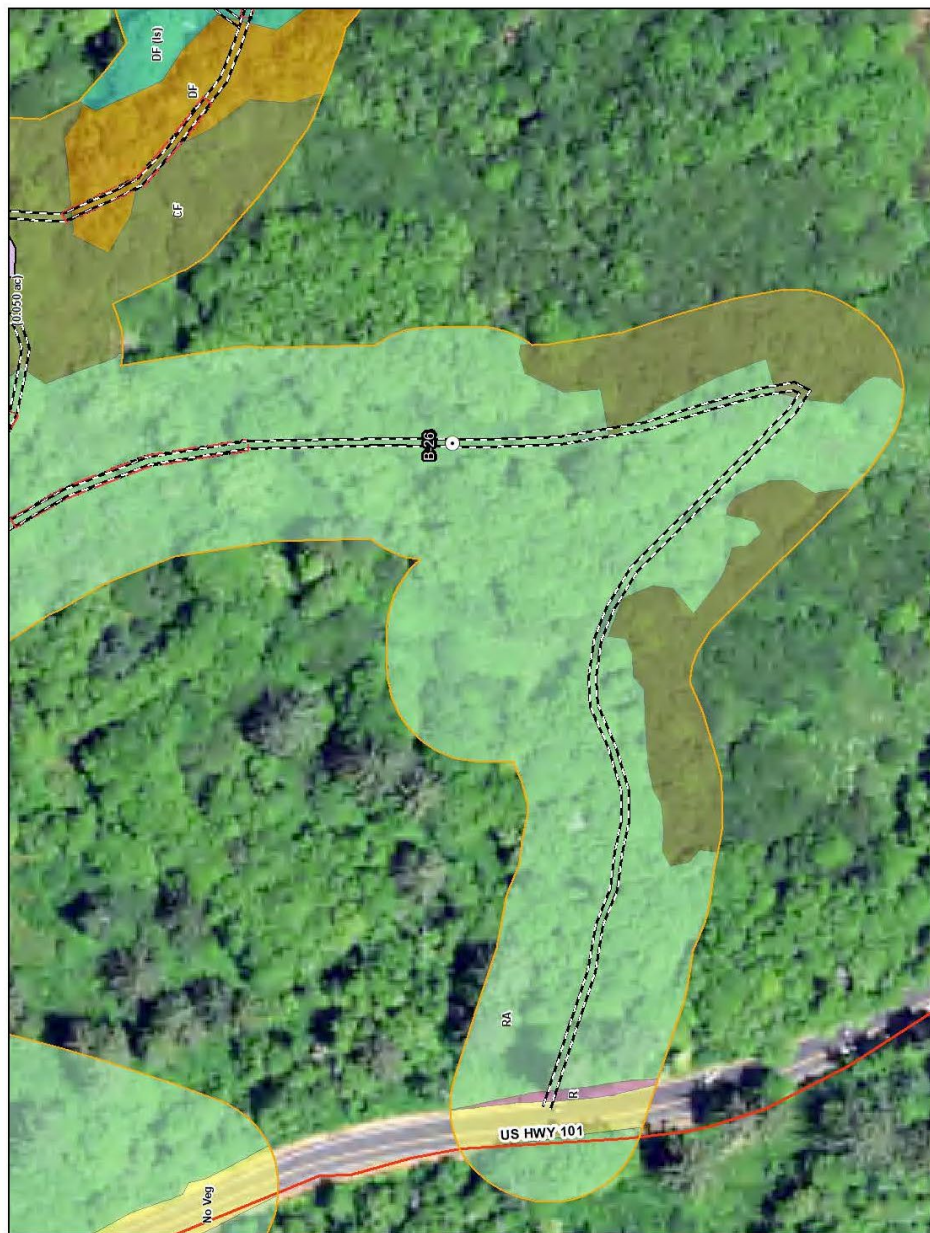
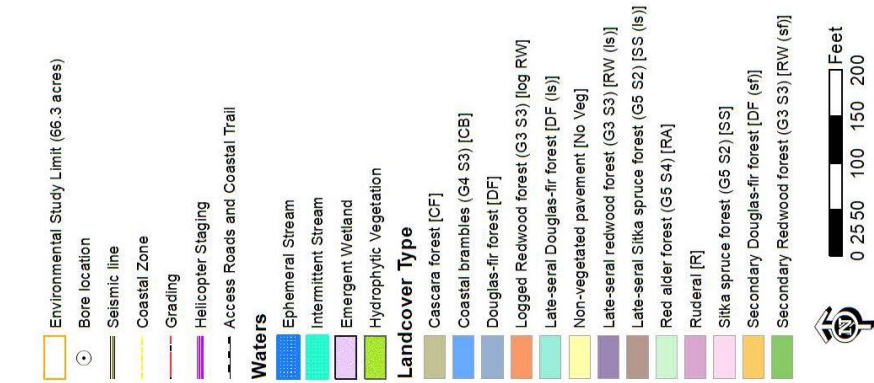


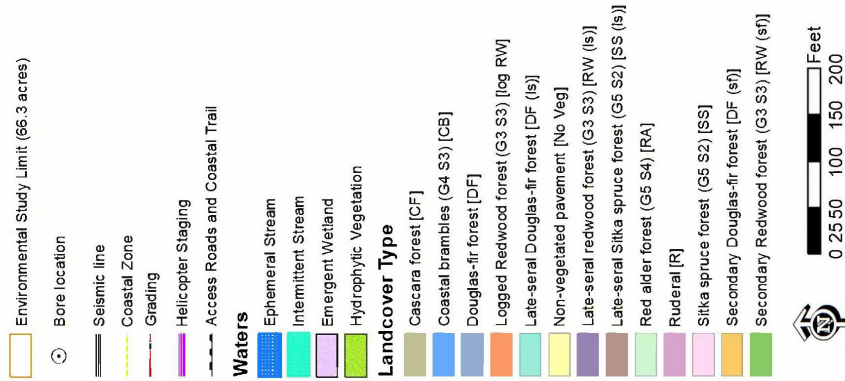


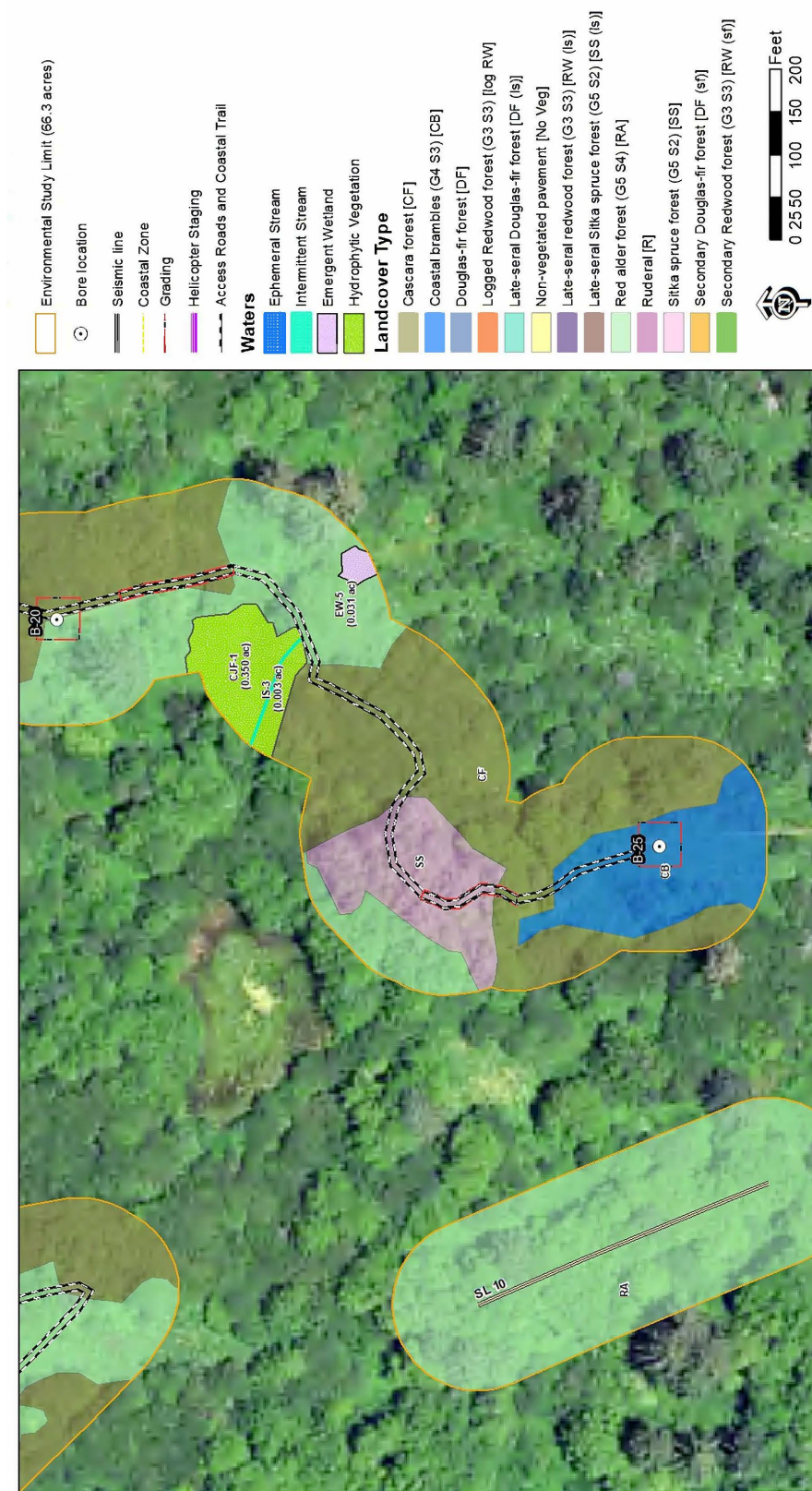




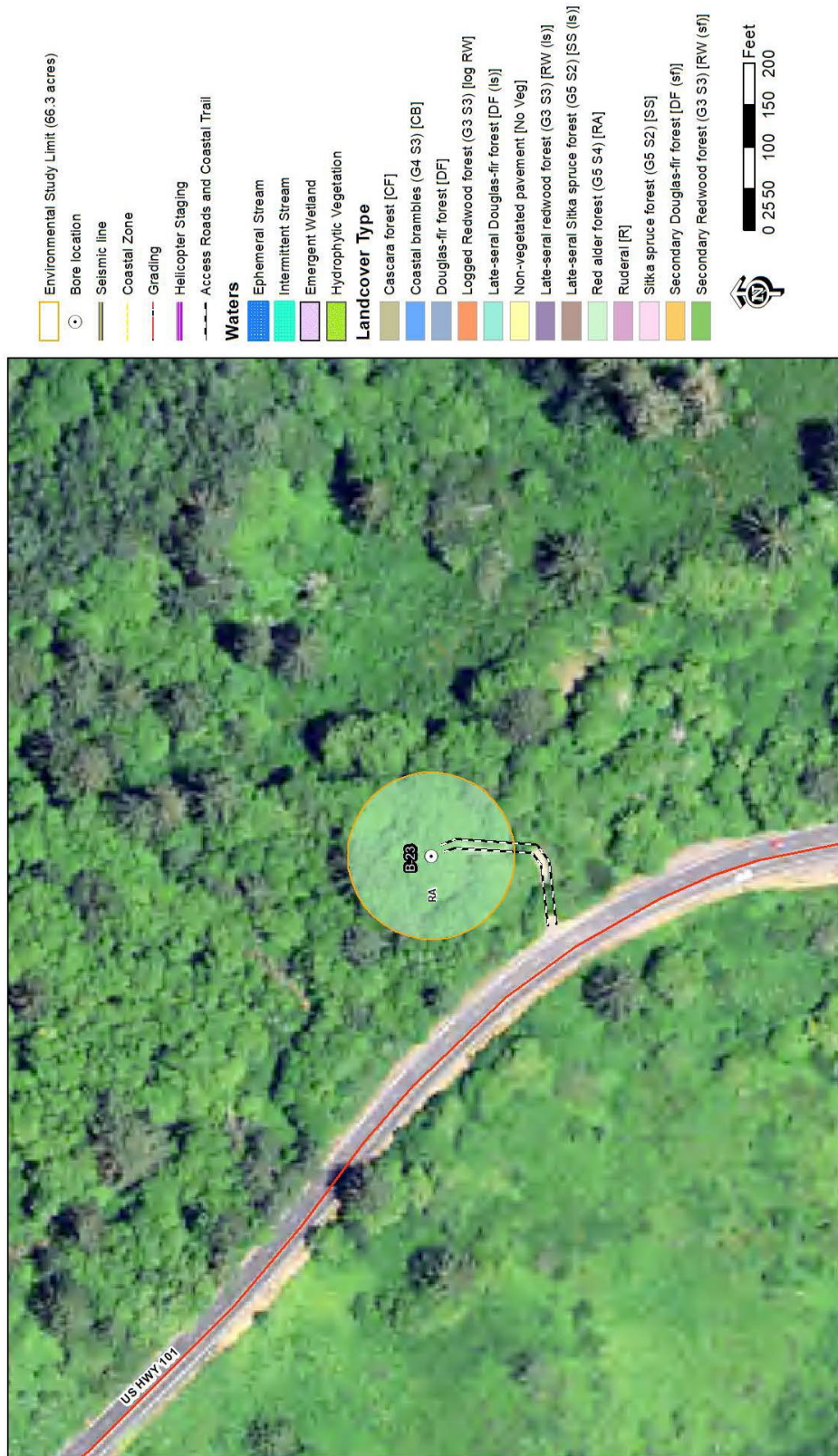












Appendix J. Botanical Surveys within the ESL



Vascular and non-vascular plants observed during botanical surveys conducted within the Environmental Study Limits (ESL)

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
Trees (9)					
	<i>Alnus rubra</i>	red alder	Betulaceae	yes	x
	<i>Chamaecyparis</i> sp. (ornamental)	cedar	Cupressaceae	no	x
	<i>Frangula purshiana</i> ssp. <i>purshiana</i>	California cascara	Rhamnaceae	yes	x
	<i>Malus</i> sp.	apple	Rosaceae	no	x
	<i>Notholithocarpus densiflorus</i> var. <i>densiflorus</i>	tree tanbark	Fagaceae	yes	x
	<i>Picea sitchensis</i>	Sitka spruce	Pinaceae	yes	x
	<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>	Douglas-fir	Pinaceae	yes	x
	<i>Sequoia sempervirens</i>	coast redwood	Cupressaceae	yes	x
	<i>Tsuga heterophylla</i>	western hemlock	Pinaceae	yes	x
Shrubs (34)					
	<i>Baccharis pilularis</i> ssp. <i>consanguinea</i>	upright coyote-brush	Asteraceae	yes	x
	<i>Berberis nervosa</i>	Cascade barberry	Berberidaceae	yes	x
	<i>Chaenomeles</i> sp.	quince	Rosaceae	no	x
	<i>Cotoneaster</i> sp.	cotoneaster	Rosaceae	no	x
	<i>Crataegus monogyna</i>	one-seeded hawthorn	Rosaceae	no	x
	<i>Diplacus (Mimulus) aurantiacus</i>	orange bush monkeyflower	Phrymaceae	yes	x
	<i>Escallonia rubra</i>	red claws	Grossulariaceae	no	x

¹ The number of taxa recorded for each habit is indicated in parentheses.

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Fuchsia magellanica</i>	hardy fuchsia	Onagraceae	no	x
	<i>Fuchsia</i> sp.	fuchsia	Onagraceae	no	x
	<i>Gaultheria shallon</i>	salal	Ericaceae	yes	x
	<i>Hedera helix</i>	English ivy	Araliaceae	no	x
	<i>Holodiscus discolor</i>	creambush ocean-spray	Rosaceae	yes	x
	<i>Ligustrum</i> sp.	privet	Oleaceae	no	x
	<i>Lonicera etrusca</i>	Etruscan honeysuckle	Caprifoliaceae	no	x
	<i>Lonicera hispidula</i>	California pink honeysuckle	Caprifoliaceae	yes	x
	<i>Lonicera involucrata</i> var. <i>ledbourii</i>	twinberry	Caprifoliaceae	yes	x
	<i>Menziesia ferruginea</i>	false azalea	Ericaceae	yes	x
	<i>Prunus laurocerasus</i>	laurel cherry	Rosaceae	no	x
	<i>Rhododendron macrophyllum</i>	Pacific rhododendron	Ericaceae	yes	x
	<i>Ribes menziesii</i> var. <i>menziesii</i>	Menzies's gooseberry	Grossulariaceae	yes	x
	<i>Ribes roezlii</i> var. <i>cruentum</i>	Coast Ranges gooseberry	Grossulariaceae	yes	x
	<i>Rosa nutkana</i> spp. <i>nutkana</i>	Nootka rose	Rosaceae	yes	x
	<i>Rosa</i> sp. (cultivar)	rose	Rosaceae	no	x
	<i>Rubus armeniacus</i>	Himalayan blackberry	Rosaceae	no	x
	<i>Rubus laciniatus</i>	cut-leaved blackberry	Rosaceae	no	x
	<i>Rubus leucodermis</i>	white-stemmed blackberry	Rosaceae	yes	x
	<i>Rubus parviflorus</i>	thimbleberry	Rosaceae	yes	x
	<i>Rubus spectabilis</i>	salmonberry	Rosaceae	yes	x
	<i>Rubus ursinus</i>	California blackberry	Rosaceae	yes	x
	<i>Salix scouleriana</i>	Scouler's willow	Salicaceae	yes	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Sambucus racemosa</i> var. <i>racemosa</i>	red elderberry	Adoxaceae	yes	x
	<i>Toxicodendron diversilobum</i>	Pacific poison oak	Anacardiaceae	yes	x
	<i>Vaccinium ovatum</i>	evergreen huckleberry	Ericaceae	yes	x
	<i>Vaccinium parvifolium</i>	California red huckleberry	Ericaceae	yes	x
Herbs (127)					
	<i>Achillea millefolium</i>	yarrow	Asteraceae	yes	x
	<i>Acemisson americanus</i> var. <i>americanus</i>	American bird's-foot-trefoil	Fabaceae	yes	x
	<i>Acemisson parviflorus</i>	small-flowered lotus	Fabaceae	yes	x
	<i>Actaea rubra</i>	baneberry	Rosaceae	yes	x
	<i>Angelica hendersonii</i>	Henderson's angelica	Apiaceae	yes	x
	<i>Anisocarpus madioides</i>	forest madia	Asteraceae	yes	x
	<i>Aquilegia formosa</i>	western crimson columbine	Ranunculaceae	yes	x
	<i>Asarum caudatum</i>	western wild ginger	Aristolochiaceae	yes	x
	<i>Asyneuma prenanthoides</i>	western hare-bell	Campanulaceae	yes	x
	<i>Barbarea orthoceras</i>	American yellow-rocket	Brassicaceae	yes	x
	<i>Bellis perennis</i>	English daisy	Asteraceae	no	x
	<i>Brassica nigra</i>	black mustard	Brassicaceae	no	x
	<i>Brassica rapa</i>	field mustard	Brassicaceae	no	x
	<i>Cardamine breweri</i>	Brewer's bitter-cress	Brassicaceae	yes	x
	<i>Cardamine californica</i>	milkmaids	Brassicaceae	yes	x
	<i>Cardamine oligosperma</i>	little bittercress	Brassicaceae	yes	x
	<i>Centaureum erythraea</i>	European centaury	Gentianaceae	no	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Chrysosplenium glechomifolium</i>	Pacific golden-saxifrage	Saxifragaceae	yes	x
	<i>Cirsium brevistylum</i>	short-styled thistle	Asteraceae	yes	x
	<i>Cirsium vulgare</i>	bull thistle	Asteraceae	no	x
	<i>Claytonia sibirica</i>	candy flower	Montiaceae	yes	x
	<i>Conium maculatum</i>	poison hemlock	Apiaceae	no	x
	<i>Crocasmia x. crocosmiifolia</i>	garden montbretia	Iridaceae	no	x
	<i>Daucus carota</i>	Queen Anne's lace	Apiaceae	no	x
	<i>Delairea odorata</i>	common Cape-ivy	Asteraceae	no	x
	<i>Delphinium trolliifolium</i>	cow-poison larkspur	Papaveraceae	yes	x
	<i>Dicentra formosa</i>	western bleeding heart	Papaveraceae	yes	x
	<i>Digitalis purpurea</i>	common foxglove	Plantaginaceae	no	x
	<i>Epilobium ciliatum</i>	ciliate willowherb	Onagraceae	yes	x
	<i>Eriophyllum lanatum</i>	common woolly-sunflower	Asteraceae	yes	x
	<i>Erythranthe (Mimulus) dentata</i>	coast monkeyflower	Phrymaceae	yes	x
	<i>Erythranthe (Mimulus) guttata</i>	seep-spring monkeyflower	Phrymaceae	yes	x
	<i>Erythranthe (Mimulus) moschata</i>	musk monkeyflower	Phrymaceae	yes	x
	<i>Euchiton gymnocephalus</i>	creeping cudweed	Asteraceae	no	x
	<i>Galium aparine</i>	bedstraw	Rubiaceae	yes	x
	<i>Galium</i> sp.	bedstraw	Rubiaceae	unk	x
	<i>Galium triflorum</i>	three-flowered bedstraw	Rubiaceae	yes	x
	<i>Gamochaeta ustulata</i>	Pacific cudweed	Asteraceae	yes	x
	<i>Geranium dissectum</i>	cutleaf crane's-bill	Geraniaceae	no	x
	<i>Geum macrophyllum</i> var. <i>macrophyllum</i>	large-leaved avens	Rosaceae	yes	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Helminthotheca echioides</i>	bristly ox-tongue	Asteraceae	no	x
	<i>Heracleum maximum</i>	cow parsnip	Apiaceae	yes	x
	<i>Hieracium albiflorum</i>	white-flowered hawkweed	Asteraceae	yes	x
	<i>Hypericum cf. calycinum</i>	Aaron's beard	Hypericaceae	no	x
	<i>Hypericum perforatum</i>	Klamath weed	Hypericaceae	no	x
	<i>Hypochaeris radicata</i>	rough cat's-ear	Asteraceae	no	x
	<i>Iris douglasiana</i>	Douglas iris	Iridaceae	yes	x
	<i>Lamium purpureum</i>	purple henbit	Lamiaceae	no	x
	<i>Lathyrus vestitus</i> var. <i>vestitus</i>	woodland pea	Fabaceae	yes	x
	<i>Leontodon saxatilis</i>	hairy hawkbit	Asteraceae	no	x
	<i>Leucanthemum vulgare</i>	ox-eye daisy	Asteraceae	no	x
	<i>Lilium columbianum</i>	Columbia lily	Liliaceae	yes	x
	<i>Linum bienne</i>	flax	Linaceae	no	x
	<i>Listera cordata</i>	heart-leaved twayblade	Orchidaceae	yes	x
	<i>Lotus corniculatus</i>	broadleaf birdsfoot trefoil	Fabaceae	no	x
	<i>Lupinus rivularis</i>	riverbank lupine	Fabaceae	yes	x
	<i>Lupinus</i> sp.	lupine	Fabaceae	yes	x
	<i>Lysimachia (Anagallis) arvensis</i>	scarlet pimpernel	Myrsinaceae	no	x
	<i>Lysimachia (Trientalis) latifolia</i>	Pacific starflower	Myrsinaceae	yes	x
	<i>Madia sativa</i>	coast tarweed	Asteraceae	yes	x
	<i>Maianthemum dilatatum</i>	two-leaved false-Solomon's-seal	Ruscaceae	yes	x
	<i>Maianthemum stellatum</i>	starry false lily-of-the-valley	Ruscaceae	yes	x
	<i>Marah oregana</i>	coast man-root	Cucurbitaceae	yes	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Matricaria discoidea</i>	pineapple weed	Asteraceae	no	x
	<i>Medicago polymorpha</i>	bur-clover	Fabaceae	no	x
	<i>Mentha pulegium</i>	pennyroyal	Lamiaceae	no	x
	<i>Mentha cf. spicata</i>	pennyroyal	Lamiaceae	no	x
	<i>Mitellastra caulescens</i>	leafy-stemmed mitrewort	Saxifragaceae	yes	x
	<i>Navarretia squarrosa</i>	skunkweed	Polemoniaceae	yes	x
	<i>Narcissus</i> sp.	daffodil	Amaryllidaceae	no	x
	<i>Nemophila parviflora</i> var. <i>parviflora</i>	woodland nemophila	Boraginaceae	yes	x
	<i>Oenanthe sarmentosa</i>	Pacific water-parsley	Apiaceae	yes	x
	<i>Osmorhiza purpurea</i>	purple sweet cicely	Apiaceae	yes	x
	<i>Oxalis oregana</i>	redwood sorrel	Oxalidaceae	yes	x
	<i>Oxalis suksdorfii</i>	Suksdorf's wood-sorrel	Oxalidaceae	yes	x
	<i>Petasites frigidus</i> var. <i>palmaris</i>	western colt's foot	Asteraceae	yes	x
	<i>Plantago lanceolata</i>	English plantain	Plantaginaceae	no	x
	<i>Plantago major</i>	greater plantain	Plantaginaceae	no	x
	<i>Polygonum</i> sp.	knotweed	Polygonaceae	unk	x
	<i>Prosartes smithii</i>	Smith's fairy bells	Liliaceae	yes	x
	<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	Lamiaceae	yes	x
	<i>Prunella vulgaris</i> var. <i>vulgaris</i>	selfheal	Lamiaceae	no	x
	<i>Ranunculus occidentalis</i>	western buttercup	Ranunculaceae	yes	x
	<i>Ranunculus parviflorus</i>	few-flowered buttercup	Ranunculaceae	no	x
	<i>Ranunculus repens</i>	common creeping buttercup	Ranunculaceae	no	x
	<i>Raphanus raphanistrum</i>	wild radish	Brassicaceae	no	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Raphanus sativus</i>	charlock	Brassicaceae	no	x
	<i>Rorippa curvisiliqua</i>	western cress	Brassicaceae	yes	x
	<i>Rumex acetosella</i>	sheep sorrel	Polygonaceae	no	x
	<i>Rumex conglomeratus</i>	clustered dock	Polygonaceae	no	x
	<i>Rumex crispus</i>	curly dock	Polygonaceae	no	x
	<i>Rumex obtusifolius</i>	broad-leaved dock	Polygonaceae	no	x
	<i>Rumex</i> sp.	dock	Polygonaceae	unk	x
	<i>Sagina procumbens</i>	matted pearlwort	Caryophyllaceae	no	x
	<i>Sanicula crassicaulis</i>	Pacific sanicle	Apiaceae	yes	x
	<i>Scrophularia californica</i>	California bee plant	Scrophulariaceae	yes	x
	<i>Senecio glomeratus</i>	cut-leaf coast burnweed	Asteraceae	no	x
	<i>Senecio jacobaea</i>	tansy ragwort	Asteraceae	no	x
	<i>Senecio minimus</i>	coastal burnweed	Asteraceae	no	x
	<i>Senecio vulgaris</i>	garden groundsel	Asteraceae	no	x
	<i>Sisymbrium officinale</i>	hedge mustard	Brassicaceae	no	x
	<i>Solanum</i> sp.	nightshade	Solanaceae	?	x
	<i>Sonchus asper</i> ssp. <i>asper</i>	prickly sow-thistle	Asteraceae	no	x
	<i>Sonchus oleraceus</i>	common sow-thistle	Asteraceae	no	x
	<i>Stachys chamissonis</i>	giant coastal hedge-nettle	Lamiaceae	yes	x
	<i>Stachys mexicana</i>	Mexican hedge-nettle	Lamiaceae	yes	x
	<i>Stachys</i> sp.	hedge-nettle	Lamiaceae	yes	x
	<i>Stellaria crispa</i>	curled starwort	Caryophyllaceae	yes	x
	<i>Stellaria media</i>	common chickweed	Caryophyllaceae	no	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Streptopus amplexifolius</i> var. <i>americanus</i>	clasping-leaved twisted stalk	Liliaceae	yes	x
	<i>Symphyotrichum chilense</i>	Pacific aster	Asteraceae	yes	x
	<i>Tellima grandiflora</i>	fringe cups	Saxifragaceae	yes	x
	<i>Tolmiea diplomenziesii</i>	pig-a-back plant	Saxifragaceae	yes	x
	<i>Tradescantia</i> sp.	tradescantia	Commelinaceae	no	x
	<i>Trifolium repens</i>	white clover	Fabaceae	no	x
	<i>Trifolium</i> sp.	clover	Fabaceae	unk	x
	<i>Trillium angustipetalum</i>	narrow-petaled trillium	Melanthiaceae	yes	x
	<i>Trillium ovatum</i> ssp. <i>ovatum</i>	Western wake robin	Melanthiaceae	yes	x
	<i>Urtica dioica</i> ssp. <i>holosericea</i>	hoary nettle	Urticaceae	yes	x
	<i>Veronica</i> sp.	veronica	Plantaginaceae	unk	x
	<i>Veronica serpyllifolia</i> ssp. <i>humifusa</i>	bright-blue speedwell	Plantaginaceae	yes	x
	<i>Vicia gigantea</i>	giant vetch	Fabaceae	yes	x
	<i>Vicia sativa</i>	common vetch	Fabaceae	no	x
	<i>Vinca major</i>	greater periwinkle	Apocynaceae	no	x
	<i>Viola sempervirens</i>	redwood violet	Violaceae	yes	x
	<i>Whipplea modesta</i>	modesty, yerba de selva	Philadelphaceae	yes	x
Graminoids (45)					
	<i>Agrostis</i> sp.	bentgrass	Poaceae	unk	x
	<i>Agrostis capillaris</i>	colonial bentgrass	Poaceae	no	x
	<i>Agrostis</i> cf. <i>gigantea</i>	redtop	Poaceae	no	x
	<i>Agrostis hallii</i>	Hall's bentgrass	Poaceae	yes	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Agrostis stolonifera</i>	creeping bentgrass	Poaceae	no	x
	<i>Aira caryophyllea</i>	European silver hairgrass	Poaceae	no	x
	<i>Anthoxanthum odoratum</i>	sweet vernal grass	Poaceae	no	x
	<i>Briza maxima</i>	rattlesnake grass	Poaceae	no	x
	<i>Bromus carinatus</i> var. <i>carinatus</i>	California brome	Poaceae	yes	x
	<i>Bromus hordeaceus</i>	soft-chess brome	Poaceae	no	x
	<i>Bromus vulgaris</i>	narrow-flowered brome	Poaceae	yes	x
	<i>Calamagrostis nutkaensis</i>	Pacific reed-grass	Poaceae	yes	x
	<i>Carex hendersonii</i>	Henderson's sedge	Cyperaceae	yes	x
	<i>Carex leptopoda</i>	taper fruit short scale sedge	Cyperaceae	yes	x
	<i>Carex obnupta</i>	slough sedge	Cyperaceae	yes	x
	<i>Carex rossii</i>	Ross' sedge	Cyperaceae	yes	x
	<i>Cortaderia jubata</i>	jubata grass	Poaceae	no	x
	<i>Cynodon dactylon</i>	Bermuda grass	Poaceae	no	x
	<i>Cynosurus echinatus</i>	hedgehog dogstail grass	Poaceae	no	x
	<i>Dactylis glomerata</i>	orchard grass	Poaceae	no	x
	<i>Deschampsia elongata</i>	elongated hair-grass	Poaceae	yes	x
	<i>Ehrharta erecta</i>	panic veldt grass	Poaceae	no	x
	<i>Eleocharis macrostachya</i>	long-stem spikerush	Cyperaceae	yes	x
	<i>Elymus glaucus</i>	blue wildrye	Poaceae	yes	x
	<i>Festuca arundinacea</i>	tall fescue	Poaceae	no	x
	<i>Festuca myuros</i>	rat-tailed fescue	Poaceae	no	x
	<i>Festuca perennis</i>	perennial rye-grass	Poaceae	no	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Festuca rubra</i>	red fescue	Poaceae	yes	x
	<i>Festuca</i> sp.	fescue	Poaceae	unk	x
	<i>Glyceria elata</i>	western tall manna-grass	Poaceae	yes	x
	<i>Holcus lanatus</i>	velvet grass	Poaceae	no	x
	<i>Hordeum vulgare</i>	barley	Poaceae	no	x
	<i>Juncus bufonius</i>	toad rush	Juncaceae	yes	x
	<i>Juncus effusus</i>	soft rush	Juncaceae	yes	x
	<i>Juncus</i> sp.	rush	Juncaceae	yes	x
	<i>Luzula comosa</i>	hairy wood rush	Juncaceae	yes	x
	<i>Luzula parviflora</i>	small-flowered wood rush	Juncaceae	yes	x
	<i>Melica</i> sp.	melic	Poaceae	yes	x
	<i>Phalaris arundinacea</i>	reed canary-grass	Poaceae	no	x
	<i>Pleuropogon refractus</i>	nodding semaphore grass	Poaceae	yes	x
	<i>Poa annua</i>	annual bluegrass	Poaceae	no	x
	<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky bluegrass	Poaceae	no	x
	<i>Scirpus microcarpus</i>	small-fruited bulrush	Cyperaceae	yes	x
	<i>Trisetum cernuum</i>	nodding trisetum	Poaceae	yes	x
Ferns and Fern Allies (8)					
	<i>Athyrium filix-femina</i>	soft athyrium (i.e., lady fern)	Dryopteridaceae	yes	x
	<i>Blechnum spicant</i>	deer fern	Blechnaceae	yes	x
	<i>Equisetum arvense</i>	common horsetail	Equisetaceae	yes	x
	<i>Equisetum telmateia</i> ssp. <i>braunii</i>	giant horsetail	Equisetaceae	yes	x

Habit ¹	Scientific Name	Common Name	Family	Native?	Present in LCG Phase 2B Geotech ESL
	<i>Polypodium glycyrrhiza</i>	sweet-licorice fern	Polypodiaceae	yes	x
	<i>Polypodium scolieri</i>	leather-leaved polypody	Polypodiaceae	yes	x
	<i>Polystichum munitum</i>	sword fern	Dryopteridaceae	yes	x
	<i>Pteridium aquilinum</i> var. <i>pubescens</i>	bracken fern	Dennstaedtiaceae	yes	x
Lichens (7)					
	<i>Cladonia</i> sp.	cladonia	Cladoniaceae	yes	x
	<i>Hypogymnia imshaugii</i>	Imshaug's tube lichen	Parmeliaceae	yes	x
	<i>Parmelia</i> sp.	parmelia	Parmeliaceae	yes	x
	<i>Sphaerophorus globosus</i>	globe ball lichen	Sphaerophoraceae	yes	x
	<i>Usnea</i> cf. <i>cornuta</i>	usnea	Parmeliaceae	yes	x
	<i>Usnea</i> cf. <i>filipendula</i>	fishbone beard lichen	Parmeliaceae	yes	x
	<i>Usnea longissima</i>	Methusela's beard lichen	Parmeliaceae	yes	x
Bryophytes (8)					
	<i>Conocephalum conicum</i>	snakeskin liverwort	Conocephalaceae	yes	x
	<i>Fissidens crispus</i>	pocket moss	Fissidentaceae	yes	x
	<i>Frullania nisquallensis</i>	hanging millipede liverwort	Jubulaceae	yes	x
	<i>Kindbergia oregana</i>	Oregon beaked moss	Brachytheciaceae	yes	x
	<i>Isoetecium myosuroides</i>	icicle moss	Brachytheciaceae	yes	x
	<i>Neckera</i> cf. <i>douglasii</i>	Douglas neckera moss	Neckeraceae	yes	x
	<i>Polytrichum</i> sp.	polytrichum	Polytrichaceae	yes	x
	<i>Porella navicularis</i>	tree ruffle liverwort	Porellaceae	yes	x



Appendix K. Invasive Plant Species Identified in the ESL



Scientific Name	Common Name	CDFA	Cal-IPC
<i>Agrostis stolonifera</i>	creeping bent	–	Limited
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	–	Limited
<i>Brassica nigra</i>	black mustard	–	Moderate
<i>Brassica rapa</i>	field mustard	–	Limited
<i>Briza maxima</i>	quaking grass	–	Limited
<i>Bromus hordeaceus</i>	soft-chess brome	–	Limited
<i>Cirsium vulgare</i>	bull thistle	B	Moderate
<i>Conium maculatum</i>	poison hemlock	–	Moderate
<i>Cortaderia jubata</i>	jubata grass	B	High
<i>Cynodon dactylon</i>	Bermuda grass	–	Moderate
<i>Cynosurus echinatus</i>	hedgehog dogstail grass	–	Moderate
<i>Dactylis glomerata</i>	orchard grass	–	Limited
<i>Ehrharta erecta</i>	panic veldt grass	–	Moderate
<i>Cotoneaster</i> sp.	cotoneaster	–	Moderate
<i>Crataegus monogyna</i>	English hawthorn	–	Limited
<i>Crocsmia x crocosmiiflora</i>	garden montbretia	–	Limited
<i>Dactylis glomerata</i>	orchard grass	–	Limited
<i>Delairea odorata</i>	common Cape-ivy	B	High
<i>Digitalis purpurea</i>	foxglove	–	Limited
<i>Festuca arundinacea</i>	tall fescue	–	Moderate
<i>Festuca myuros</i>	rattail sixweeks grass	–	Moderate
<i>Festuca perennis</i>	Italian rye grass	–	Moderate
<i>Geranium dissectum</i>	cut-leaved geranium	–	Limited
<i>Hedera helix</i>	English ivy	–	High
<i>Helminthotheca echioides</i>	bristly ox-tongue	–	Limited
<i>Holcus lanatus</i>	velvet grass	–	Moderate
<i>Hypericum perforatum</i>	Klamath weed	C	Limited
<i>Hypochaeris radicata</i>	rough cat's ear	–	Moderate
<i>Leucanthemum vulgare</i>	ox-eye daisy	–	Moderate
<i>Ligustrum</i> sp.	privet	–	(<i>L. lucidum</i> is Limited)
<i>Medicago polymorpha</i>	bur-clover	–	Limited
<i>Mentha pulegium</i>	pennyroyal	–	Moderate
<i>Plantago lanceolata</i>	English plantain	–	Limited
<i>Poa pratensis</i> ssp. <i>pratensis</i>	Kentucky bluegrass	–	Limited
<i>Ranunculus repens</i>	common creeping buttercup	–	Limited
<i>Raphanus sativus</i>	wild radish	–	Limited
<i>Rumex acetosella</i>	sheep sorrel	–	Moderate
<i>Rumex crispus</i>	curly dock	–	Limited
<i>Rubus armeniacus</i>	Himalayan blackberry	–	High
<i>Senecio glomeratus</i>	cut-leaf coast burnweed	–	Moderate
<i>Senecio jacobaea</i>	tansy ragwort	B	Limited
<i>Vinca major</i>	greater periwinkle	–	Moderate

Note: The California Department of Food and Agriculture (CDFA) and California Invasive Plant Council (Cal-IPC) lists assign ratings that reflect the CDFA and Cal-IPC views of the statewide importance of the pest, likelihood that eradication or control efforts would be successful, and present distribution of the pest in the state. These ratings are guidelines that indicate the most appropriate action to take against a pest under general circumstances. The Cal-IPC species list is more inclusive than the CDFA list.

CDFA categories are defined as follows:

- B: Known economic importance subject to: eradication, containment, control or other holding action at the discretion of the individual county agricultural commissioner.
- C: A pest of known economic or environmental detriment and, if present in California, it is usually widespread. There is no state enforced action other than providing for pest cleanliness.

Cal-IPC categories are defined as follows:

- High: Species with severe ecological impacts, high rates of dispersal and establishment, and usually widely distributed.
- Moderate: Species with substantial and apparent ecological impacts, moderate to high rates of dispersal, establishment dependent on disturbance, and limited to widespread distribution.
- Limited: Species with minor ecological impacts, low to moderate rates of invasion, limited distribution, and locally persistent and problematic.

Appendix L. Sensitive Natural Community Impacts



Land Cover Type	Acres within ESL	Total Acres of Temporary Impact ¹	Land Ownership ² (Acres of Impact)	Project Component	Description of Work
Redwood Forest (late-seral)	13.45	0.35	DNCRSP (0.35)	Bore Holes B-28*, B-29*, B-30A*, B-30B*	Undergrowth trimming to 6-inches above the ground; clearing of <6-inch dbh redwoods at B-30B; 2 by 2 feet of ground clearing for up to eight platform legs at each location.
				Seismic Lines SL-14, SL-16, SL-17, SL-18 SL-21	Undergrowth trimming.
				Foot Access (Footpaths)	Undergrowth trimming.
Redwood Forest (secondary)	4.35	0.30	GDRC (0.30)	Bore Holes B-16, B-36, B-40	Undergrowth trimming.
				Seismic Lines SL-18, SL-21, SL-22, SL-23	Undergrowth trimming.
				Vehicle Access	Brushing, limbing, small tree removal, and grading of 24 inches or less.
Redwood Forest (logged)	1.44	0.10	GDRC (0.10)	Seismic Line SL-20	Undergrowth trimming.
				Bore Hole B-35*	Undergrowth trimming to 6-inches above the ground; limbing for helicopter access; 2 by 2 feet of ground clearing for up to eight platform legs.
Sitka spruce forest	0.67	0.01	RNP (0.01)	Vehicle Access	Brushing, limbing, minimal tree removal (alders), and grading to 24 inches or less (limited to uneven areas of Coastal Trail, to allow equipment access).
Coastal Brambles	3.54	0.25	DNCRSP (0.17)	Bore Holes B-28*, B-29*, B-30A*, B-34A*	Undergrowth trimming to 6-inches above the ground; removal of up to one mature alder and limbing on one side of 18-inch dbh redwood at B-34A; 2 by 2 feet of ground clearing for up to eight platform legs at each location.
				Seismic Lines SL-11, SL-12, SL-14, SL-15	Undergrowth trimming.
			RNP (0.06)	Bore Hole B-25	Undergrowth trimming.
			GDRC (0.02)	Seismic Line SL-23	Undergrowth trimming.
				Vehicle Access	Brushing and grading up to 24 inches or less along existing logging roads. Placement of pinned stabilization fabric and rock.
Red Alder Forest ³	24.07	0.58	DNCRSP (0.14)	Bore Hole B-34B*	Undergrowth trimming to 6-inches above the ground; removal of up to one mature alder; 2 by 2 feet of ground clearing for up to eight platform legs.
				Seismic Lines SL-11, SL-12, SL-13, SL-15	Undergrowth trimming.
				Foot Access (Footpaths)	Undergrowth trimming.
			RNP (0.44)	Bore Holes B-19, B-20, B-22, B-26	Undergrowth trimming.
				Seismic Lines SL-9, SL-10, SL-11, SL-23	Undergrowth trimming.
				Vehicle Access	Brushing, limbing, minimal tree removal, and grading to 24 inches or less (limited to uneven areas of Coastal Trail and existing roads, to allow equipment access). Heavy grading, brushing, and small tree removal would be required for access to B-22.
Total	47.52	1.59			

*Helicopter boring location

¹ Acres of temporary impacts were calculated based on the following:

Bore holes: Impact areas estimated conservatively as 50 by 50 feet.

Seismic Lines: Impacts areas estimated to be 4 feet wide for foot access and to lay out equipment.

Footpaths: Impacts areas estimated to be 4 feet wide for foot access.

Vehicle Access: Impact areas estimated for a 6-foot-wide drill rig. Erosional scar (access road to B-22) impact area estimated to be 12 feet wide.

² DNCRSP = Del Norte Coast Redwoods State Park; GDRC = Green Diamond Resource Company; RNP = Redwood National Park

³ Not all areas of this community are considered sensitive by CDFW.