Dr. Fine Bridge Replacement Project

DEL NORTE COUNTY, CALIFORNIA
DISTRICT 1 – DN – 101 (Post Miles 35.8 / 36.5)
01-43640 / 0100000193
State Clearinghouse House Number: 2010102037

Draft Environmental Impact Report/ Environmental Assessment

Prepared by the
State of California, Department of Transportation

September 2019

The environmental review, consultation, and any other action required in accordance with applicable federal laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 3016 and executed by FHWA and Caltrans.

General Information About This Document

What's in this document:

The California Department of Transportation (hereinafter Caltrans), as assigned by the Federal Highway Administration (FHWA), has prepared this Environmental Impact Report/Environmental Assessment (EIR/EA), which examines the potential environmental impacts of alternatives being considered for the proposed project in Del Norte County, California. Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and under the California Environmental Quality Act (CEQA). The document tells you why the project is being proposed, what alternatives we have considered for the project, how the existing environment could be affected by the project, the potential impacts of each of the alternatives, and the proposed avoidance, minimization, and/or mitigation measures.

What you should do:

- Please read the document.
- Additional copies of the document and the related technical studies are available for review at the Caltrans District 1 Office, 1656 Union Street, Eureka, CA, and at the Del Norte County Library, Main Branch, 190 Price Mall, Crescent City, CA.
- We would appreciate receiving any feedback you may have on the project. If you have any comments regarding the proposed project, please send your written comments to Caltrans by the deadline.
- Submit comments via postal mail to: Rachelle Hadley, Environmental Planner, California Department of Transportation, P.O. Box 3700, Eureka, CA, 95502-3700.
- Submit comments via email to: rachelle.hadley@dot.ca.gov
- Submit comments by the deadline: November 15, 2019.

What happens next:

After comments are received from the public and reviewing agencies, Caltrans, as assigned by the Federal Highway Administration (FHWA), 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 design and construct all or part of the project.

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Rachelle Hadley, North Region Environmental, Branch E-2, P.O. Box 3700, Eureka, CA 95502-3700; 707-445-6417 (Voice), or use the California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice), or 711.

SCH#: 2010102037
01-DN-101-35.8/36.5
EA: 43640/EFIS: 0100000193

Dr. Fine Bridge Replacement Project

Located on United States Route 101 in Del Norte County
Near Crescent City 0.2 mile North of the Smith River Overhead Bridge to 0.9 mile North of the Smith River Overflow Bridge

Draft Environmental Impact Report/Environmental Assessment

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C) and 49 USC 303 for Section 4(f)

THE STATE OF CALIFORNIA
Department of Transportation

Responsible Agencies:
California Transportation Commission
California Department of Fish and Wildlife
California Coastal Commission
North Coast Regional Water Quality Control Board
State Lands Commission

9/23/19
Date of Approval

For Matt Brady, District Director

California Department of Transportation
NEPA Lead Agency

9/23/19
Date of Approval

For Matt Brady, District Director

California Department of Transportation
CEQA Lead Agency

The following person may be contacted for additional information concerning this document:

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707-445-6417

Summary

The California Department of Transportation (Caltrans) proposes to replace the existing Smith River Bridge (Caltrans Bridge #01-0020), known as the Dr. Ernest Fine Memorial Bridge (referred to as the Dr. Fine Bridge hereinafter). The proposed project is part of the State Highway Operation and Protection Program (SHOPP) year 2021 and is programmed to be funded through project completion.

NEPA Assignment

California participated in the "Surface Transportation Project Delivery Pilot Program" (Pilot Program) pursuant to 23 USC 327, for more than five years, beginning July 1, 2007, and ending September 30, 2012. Moving Ahead for Progress in the 21st Century (MAP-21) (P.L. 112-141), signed by President Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, Caltrans entered into a Memorandum of Understanding pursuant to 23 USC 327 (NEPA Assignment MOU) with FHWA. The NEPA Assignment MOU became effective October 1, 2012, and was renewed on December 23, 2016, for a term of five years. In summary, Caltrans continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and Caltrans assumed all of the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off of the State Highway System within the State of California, except for certain categorical exclusions that FHWA assigned to Caltrans under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

Joint CEQA/NEPA Document

The proposed project is a joint project by Caltrans and the Federal Highway Administration (FHWA), and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. Caltrans is the lead agency under NEPA and the lead agency under CEQA. In addition, FHWA's responsibility for 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 United States Code Section 327 (23 USC 327) and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, often a “lower level” document is prepared for NEPA. One of the most common joint document types is an Environmental Impact Report/Environmental Assessment (EIR/EA).

After receiving comments from the public and reviewing agencies, a Final EIR/EA will be prepared. Caltrans may prepare additional environmental and/or engineering studies to address comments. The Final EIR/EA will include responses to comments received on the Draft EIR/EA and will identify the preferred alternative. If the decision is made to approve the project, a Notice of Determination will be published for compliance with CEQA, and Caltrans will decide whether to issue a Finding of No Significant Impact (FONSI) or require an Environmental Impact Statement (EIS) for compliance with NEPA. A Notice of Availability (NOA) of the FONSI will be sent to the affected units of federal, state, and local government, and to the State Clearinghouse in compliance with Executive Order 12372.

Purpose and Need

The purpose of the proposed project is to replace the existing Dr. Fine Bridge, which would improve the safety, connectivity, and reliability of the bridge for hikers, bikers, travelers, commuters, and freight carriers. The project is needed to address several critical issues associated with the existing bridge constructed in 1940, that include steel degradation, scour, not seismically up to standard, and functionally obsolete. The bridge would be replaced with a structure that meets current material, geometric, scour, and seismic design standards.

Proposed Action

The project is on U.S. Route 101 (U.S. 101) in Del Norte County from postmiles (PM) 35.8 to 36.5, approximately 10 miles north of Crescent City. Within the limits of the project, U.S. 101 is a conventional two-lane, undivided highway. Presently, Dr. Fine Bridge has two 12-foot lanes, 1-foot non-standard shoulders, and a 21-inch elevated maintenance walkway. The new two-lane bridge would have two 12-foot lanes, 8-foot shoulders, and a 6-foot- wide separated pedestrian walkway.

The following three build alternatives and a no-build alternative are under consideration.

1. Cast-in-place West bridge on a new alignment
2. Pre-cast West bridge on a new alignment

3. Cast-in-place bridge on existing alignment

Under Alternative 1, the new bridge type would be a Cast-in-Place (CIP) Box Girder on isolation bearings with three piers (one pier in the active Smith River channel). Under Alternative 2, the new bridge type would be a pre-cast slab bridge with two piers and three bents (two piers in the active Smith River channel). Under both Alternatives 1 and 2, the new bridge would be located west of the existing bridge alignment and the existing bridge would be utilized to carry traffic while the new bridge is constructed. Once construction of the bridge and other components (grading, fill, roadway tie-ins, and retaining walls) is completed and traffic is moved over, the existing bridge would be demolished and removed.

Under Alternative 3, the new bridge would be a CIP Box Girder on isolation bearings with three piers (one pier in the active Smith River channel). A temporary detour bridge would be constructed east of the existing bridge and used to carry traffic while the new bridge is completed along the existing alignment. This alternative considers two construction options for completing the temporary detour bridge. Option A (referred to as 3A hereinafter) would use a Jack and Slide method where the main spans of the existing bridge would be relocated to the east and would be used as part of a temporary detour while the new bridge is built along the existing alignment. Option B (referred to as 3B hereinafter) would use a temporary panel bridge for the detour.

Project Impacts

Table S-1 summarizes the potential project impacts under each Alternative. Caltrans has prepared an EIR for this project, and pending public review, expects to determine from this study that the project alternatives would have a significant impact on the environment under CEQA. The CEQA impact conclusions are summarized as follows:

- The project would have no permanent impacts on cultural resources, geology/soils, mineral resources, population/housing, public services, and timberlands.
- The project would have less-than-significant impacts on land use/planning, Wild and Scenic Rivers, farmlands, utilities/services systems, transportation/traffic, visual resources, hydrology and water quality, floodplain, paleontological resources, hazardous materials, air quality, greenhouse gas, noise, biological resources, and economic and right-of-way resources.

With mitigation measures incorporated, the project alternatives would have less-than-significant impacts on the following resources:

- Coho salmon (Oncorhynchus kisutch).

- Wetlands and other waters.
- Riparian habitat.
- Western pearlshell mussel (*Margaritifera falcata*).
- Visual/aesthetics.

To mitigate for project impacts on coho salmon, Caltrans would complete off-site compensatory mitigation by improving fish passage at a site deemed acceptable to the California Department of Fish and Wildlife (CDFW) (e.g., Dominie Creek). Compensatory mitigation to offset impacts on wetlands and other waters would be completed through on-site enhancement and/or off-site restoration in the Smith River watershed. Impacts on riparian habitat would be offset through compensatory mitigation, which would include on-site restoration and replanting of native vegetation. Mitigation ratios in the coastal zone are typically 4:1; exact ratios would be determined in coordination with the permitting agencies.

Mitigation measures for western pearlshell mussel would include establishing and protecting an Environmental Sensitive Area around the mussel bed, minimizing erosion impacts, minimizing increases in velocity and shear stress at the mussel bed, monitoring the mussels during construction, and relocating mussels.

Coordination with Public and Other Agencies

The permits, reviews, and approvals required for project construction are listed in Table S-2.

In June 2017, Caltrans circulated an Initial Study/Mitigated Negative Declaration (IS/MND) for the project that evaluated impacts from one preferred build alternative (Existing Alignment using Jack and Slide detour) and the no-build alternative. In response to agency comments received on the 2017 IS/MND, Caltrans has prepared this EIR to fully evaluate multiple alternatives for the bridge replacement. This EIR addresses the specific questions and concerns identified by each agency in their comments on the 2017 IS/MND. In addition, this EIR addresses the central questions shared by the agencies, including the recommendations that Caltrans should develop an EIR in order to:

- Thoroughly assess the alternatives (cast-in-place vs. pre-cast construction; on alignment vs. off alignment) to identify the least environmentally damaging alternative.
- Evaluate the significant direct or indirect impacts on western pearlshell mussel and anadromous fishes, including a cumulative effects analysis on the western pearlshell mussel.

- Evaluate the hydroacoustic impacts of pile driving, including the cumulative daily sound exposure levels and potential impacts on mussel populations and salmonids under each alternative.
- Evaluate the wood and debris loading potential of the project alternatives and the potential significant impact this could have on river hydrology and sensitive species.
- Provide additional detail regarding the plan for compensatory mitigation for wetland fill impacts.

Table S-1. Summary of Impacts by Alternative

Environmental Topic	Alternative 1 New Alignment-West (CIP)	Alternative 2 New Alignment-West (PC)	Alternative 3 Existing Alignment (CIP)	No-build	Avoidance, Minimization and Mitigation Measures for Build Alternatives	Mitigation Measures Pursuant to CEQA for Build Alternatives
Land Use: Consistent with state, regional, and local plans and programs	All build alternatives are consistent with state, regional and local plans, including the Del Norte County 2011 Regional Transportation Plan, the Del Norte County 2003 General Plan, and the Del Norte County 1983 Local Coastal Plan.	Same as Alternative 1	Same as Alternative 1	The No-build alternative is not consistent with transportation planning goals	None	None
Land Use: Compatibility with habitat conservation plan	No impact	No impact	No impact	No impact	None	None
Land Use: Located in a Coastal Zone	The project is located in the Coastal Zone and a coastal development permit will be required. As such, the purpose of this EIR is to identify the least environmentally damaging feasible alternative, as required by the California Coastal Act.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Land Use: Located near designated Wild and Scenic Rivers	Project limits are within the Smith River corridor, a state and federal designated Wild and Scenic River (recreational segment). The project may have temporary effects on scenic, recreational, and fish and wildlife resources, but would ultimately benefit these resources. There would be no impact on geologic, cultural, and historical resources.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Parks and Recreational Facilities: 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?	No impact	No impact	No impact	No impact	None	None
Parks and Recreational Facilities: 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?	Bridge replacement will include a new bike lane. The project will not have an adverse physical effect on the environment.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Parks and Recreational Facilities: Impact parks, recreational facilities, or public access?	Under all build alternatives, public access to the Smith River at the Dr. Fine Bridge during construction would be prohibited. Post construction, vehicle access to the Smith River at the Dr. Fine Bridge would be prohibited by installation of boulders along South Bank Road. Pedestrian access would still be available. Nearby sites will continue to provide vehicular access and boat launching opportunities to the Smith River.	Same as Alternative 1	Same as Alternative 1	No impact	Access-1	None
Growth: Would the project induce growth?	No impact	No impact	No impact	No impact	None	None
Farmlands/Timberlands: Convert farmland to non-agricultural use?	There will be temporary construction easements and minor property acquisitions in some areas zoned for agriculture.	Same as Alternative 1	There will be temporary construction easements in some areas zoned for agriculture.	No impact	None	None

Environmental Topic	Alternative 1 New Alignment-West (CIP)	Alternative 2 New Alignment-West (PC)	Alternative 3 Existing Alignment (CIP)	No-build	Avoidance, Minimization and Mitigation Measures for Build Alternatives	Mitigation Measures Pursuant to CEQA for Build Alternatives
Farmlands/Timberlands: Convert forest land to non-forest use?	No impact	No impact	No impact	No impact	None	None
Farmlands/Timberlands: Conflict with zoning for forest land or timberland	No impact	No impact	No impact	No impact	None	None
Community Impacts: Community Character and Cohesion	No impact	No impact	No impact	No impact	None	None
Community Impacts: Relocations and Real Property Acquisitions	No relocations and only minor property acquisitions will be required.	Same as Alternative 1	No impact	No impact	None	None
Community Impacts: Environmental Justice	No impact	No impact	No impact	No impact	None	None
Utilities/Emergency Services: Utilities	Under all build alternatives there will be some minor utility relocations.	Same as Alternative 1	Same as Alternative 1	No impact		None
Utilities/Emergency Services: Emergency Services	No detour or road closures will be required.	Same as Alternative 1	Temporary detour will be required when U.S. 101 is closed for approximately 1week under the Jack and Slide detour option and less than 1 week under the panel bridge detour.	No impact	None	None
Traffic and Transportation/Pedestrian and Bicycle Facilities: Conflict with applicable plans, ordinances, policies, or programs	All build alternatives are consistent with state, regional and local Plans, including the Del Norte County 2011 Regional Transportation Plan, the Del Norte County 2003 General Plan, and the Del Norte County 1983 Local Coastal Plan.	Same as Alternative 1	Same as Alternative 1	The No-build alternative is not consistent with transportation planning goals	None	None
Traffic and Transportation/Pedestrian and Bicycle Facilities: Increase traffic congestion	No impact	No impact	No impact	No impact	None	None
Traffic and Transportation/Pedestrian and Bicycle Facilities: Increase hazards as a result of a design feature	No impact	No impact	No impact	The No-build alternative is not consistent with current design standards.	None	None
Visual/Aesthetics: Adverse effect on scenic views/damage scenic resources	The project would have temporary and permanent effects on visual resources around the bridge; however, upon completion of the project there would be no substantial adverse effects on scenic views or substantial damage to scenic resources.	Same as Alternative 1	Same as Alternative 1	No impact	None	None

Environmental Topic	Alternative 1 New Alignment-West (CIP)	Alternative 2 New Alignment-West (PC)	Alternative 3 Existing Alignment (CIP)	No-build	Avoidance, Minimization and Mitigation Measures for Build Alternatives	Mitigation Measures Pursuant to CEQA for Build Alternatives
Visual/Aesthetics: Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.	Vegetation removal along the highway would lead to temporary and permanent visual impacts. It is anticipated that Alternatives 1 and 2 would lead to adverse visual impacts for the residences and church located northwest of the bridge as the viewers would have new views of the highway, retaining wall, and viaduct where there was once a dense vegetated screen. Vegetation removal would be temporary and tree removal would be permanent.	Same as Alternative 1	It is anticipated that Alternative 3 would lead to adverse visual impacts for the residence located northeast of the bridge due to tree and vegetation removal and new views of the highway. Vegetation removal would be temporary and tree removal would be permanent.	No impact	Visual-1 Visual-2 Visual-3 Visual-4 (Alt 3) Visual-5 Visual-6 (Alt 1&2)	Visual-5 Visual-6 (Alt 1&2)
Visual/Aesthetics: Degradation of existing visual character or quality	The dominance and scale of the new bridge would be in character with the existing structure and would not substantially damage the visual character or quality of the area.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Visual/Aesthetics: Create a new source of substantial light or glare	No impact	No impact	No impact	No impact	None	None
Cultural Resources: Create a substantial adverse change in the significance of a historical resource	No Impact. There are no known historical resources in the project area.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Cultural Resources: Create a substantial adverse change in the significance of an archaeological resource	No Impact. There are no known archaeological resources in the project area. Standard specifications for inadvertent discovery of archaeological resources will be followed.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Cultural Resources: Disturbance to human remains	No Impact. Standard specifications for the inadvertent discovery of human remains will be followed.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Cultural Resources: Create a substantial adverse change in a Tribal Cultural Resource?	No Impact. There are no known tribal cultural resources in the project area.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Hydrology and Floodplain: Located within a 100-year floodplain and expose people/structure to significant risk of loss	Although a portion of the project is within the 100 year floodplain, the project would not impede or redirect flood flows, nor expose people to an increase risk in loss from flooding, tsunami, seiche, or mudflow.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Water Quality and Storm Water Runoff: Result in substantial drainage pattern alteration	There will be modification of existing drainage structures and addition of new drainage systems for the new bridge structure. However, these changes would not substantially alter existing drainage patterns.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Water Quality and Storm Water Runoff: Violation of water quality standards	Excavation and construction activities will alter the existing drainage patterns but will not have the potential to substantially violate water quality standards.	Same as Alternative 1	Same as Alternative 1	No impact	None	None

Environmental Topic	Alternative 1 New Alignment-West (CIP)	Alternative 2 New Alignment-West (PC)	Alternative 3 Existing Alignment (CIP)	No-build	Avoidance, Minimization and Mitigation Measures for Build Alternatives	Mitigation Measures Pursuant to CEQA for Build Alternatives
Water Quality and Storm Water Runoff: Change to groundwater supply or groundwater recharge	Increase in impervious surface area could result in increased water runoff and less percolation to groundwater aquifers. However, these changes would not be substantial.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Water Quality and Storm Water Runoff: Substantially degrade water quality	Caltrans' construction water quality BMPs would be implemented to ensure no construction activities adversely affect receiving waters. Caltrans would incorporate stormwater treatment system(s), including bioswales or biostrips, to remove pollutants of concern from Caltrans' roadway run-off resulting from increased impervious surface area.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Geology/Soils/Seismic/Topography: Expected likelihood of seismic related issues, including ground shaking and liquefaction	Low potential for seismic related issues as the structure would be designed using Caltrans' Seismic Design Criteria (SDC), which provides the minimum seismic requirements for highway bridges designed in California.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Geology/Soils/Seismic/Topography: Expose people or structures to potential adverse effects	During construction, workers would be exposed to shaking, lurching, and cracking. No structure or people would be exposed to potential adverse effects as the structure would be designed using Caltrans' SDC, which provides the minimum seismic requirements for highway bridges designed in California.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Mineral Resources: Loss of availability of known mineral resources	No impact	No impact	No impact	No impact	None	None
Paleontology: Destruction of paleontological resources (i.e., fossil remains and sites) as a result of ground disturbance.	Based on the geologic and paleontological information available and proposed project activities, scientifically significant fossils in the formations in the project area are unlikely to be encountered.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Hazardous Waste/Materials: Create a hazard to the environment/public	Naturally Occurring Asbestos is present in soils in the project area due to the underlying geology. If present, lead, asbestos, and treated wood waste would be handled according to all applicable regulations.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Hazardous Waste/Materials: Be located on a site which is included on a list of hazardous materials sites, and, as a result, would create a hazard to the public or environment	No impact	No impact	No impact	No impact	None	None
Air Quality: Conflict with or obstruct implementation of the applicable air quality plan	The proposed project does not involve an expansion of the existing facility and would not interfere with applicable federal and state plans.	Same as Alternative 1	Same as Alternative 1	No impact	None	None

Environmental Topic	Alternative 1 New Alignment-West (CIP)	Alternative 2 New Alignment-West (PC)	Alternative 3 Existing Alignment (CIP)	No-build	Avoidance, Minimization and Mitigation Measures for Build Alternatives	Mitigation Measures Pursuant to CEQA for Build Alternatives
Air Quality: Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	The project is exempt from regional and project-level air quality conformity requirements under 40 Code of Federal Regulations (CFR) 93.126 as it is to reconstruct a bridge with no additional travel lane/lanes (see §93.126, Table 2 – Exempt Projects). The project would not cause exceedances or new violations of the National or California Ambient Air Quality Standards. The project would generate air pollutants during the construction period. Trucks and construction equipment emit hydrocarbons, oxides of nitrogen, carbon monoxide and particulates associated with grading, hauling and various other activities. The impacts from the above activities are considered temporary and would vary from day to day as construction progresses.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Air Quality: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	The project does not involve an expansion of the existing facility and would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Air Quality: Expose sensitive receptors to substantial pollutant concentrations?	There are no sensitive receptors (e.g., residents, hospitals, schools) close enough to the project to be affected by emissions generated by trucks and equipment during project construction.	Same as Alternative 1	Same as Alternative 1	No impact	None	None
Air Quality: Create objectionable odors affecting a substantial number of people?	No impact	No impact	No impact	No impact	None	None
Noise: Expose people to noise levels in excess of adopted standards?	All build alternatives are considered "Type III" projects and are exempt from the need to perform a traffic noise impact analysis, under Title 23, Part 772 of the Code of Federal Regulations (23CFR772). During construction, the project would generate noise from equipment. These impacts would be temporary.	Same as Alternative 1	Same as Alternative 1	No impact	Chapel-1	None
Energy: Result in wasteful or unnecessary consumption of energy resources.	No impact	No impact	No impact	No impact	None	None

Environmental Topic	Alternative 1 New Alignment-West (CIP)	Alternative 2 New Alignment-West (PC)	Alternative 3 Existing Alignment (CIP)	No-build	Avoidance, Minimization and Mitigation Measures for Build Alternatives	Mitigation Measures Pursuant to CEQA for Build Alternatives
Biological Resources: Effects on habitat or sensitive natural communities	While all build alternatives will have temporary and permanent impacts on natural communities, many of these habitats already exist in a degraded condition, and project impacts would be avoided and minimized to the maximum degree possible. Alternative 1 Impacts on Environmentally Sensitive Habitat Areas: Permanent: 0.51 acre Temporary: 6.76 acres	Alternative 2 Impacts on Environmentally Sensitive Habitat Areas: Permanent: 0.51 acre Temporary: 6.76 acres	Alternative 3 Impacts on Environmentally Sensitive Habitat Areas: Permanent: 0.15 acre Temporary: 5.92 acres	No impact	Riparian-1	Riparian-1
Biological Resources: Effects on wetlands and other waters	All build alternatives would result in a permanent net-gain of river habitat through the reduction of bridge foundations in the river. Differences in wetland impacts between alternatives are a function of the bridge alignments, size of work footprint, and location of wetland areas relative to proposed construction activities and permanent features. Alternative 1 Impacts on Wetlands: Permanent: 0.06 acre Temporary: 3.04 acres Impacts on Other Waters: Permanent: 0.02 acre Temporary: 2.26 acres	Alternative 2 Impacts on Wetlands: Permanent: 0.07 acre Temporary: 3.04 acres Impacts on Other Waters: Permanent: 0.02 acre Temporary: 2.26 acres	Alternative 3 Impacts on Wetlands: Permanent: 0.02 acre Temporary: 2.95 acres Impacts on Other Waters: Permanent: 0.01 acre Temporary: 2.20 acres	No impact	Wetlands-1	Wetlands-1
Biological Resources: Effects on sensitive or special status species	All build alternatives would have impacts on bats, ringtail, marine mammals, migratory birds and raptors, special-status amphibians and reptiles, and special-status fish. Mitigation measures are included to avoid, minimize, and compensate for impacts on coho salmon and western pearlshell mussel.	Same as Alternative 1	Same as Alternative 1	No impact	Species-1, Species-2, Species-3, Species-4, Species-5, Species-6, Species-7, Species-8, Species-9, Mussel-1, Coho-1	Mussel-1, Coho-1
Biological Resources: Conflict with local policies/plans	No impact	No impact	No impact	No impact	None	None
Climate Change/Sea Level Rise	The project would not add travel lanes or increase vehicle miles traveled. Therefore, the project would not increase 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 GHGs. Also, the bridge is expected to be resilient to predicted future sea level rise.	Same as Alternative 1	Same as Alternative 1	No impact	None	None

Table S-2. Permits and Approvals

Agency	Permit/Approval	Status
United States Fish and Wildlife Service	Section 7 Consultation for Threatened and Endangered Species	Consultation not initiated until after preferred alternative is selected. To be completed prior to Final Environmental Document (FED).
National Oceanographic and Atmospheric Administration-National Marine Fisheries Service (NOAA/NMFS)	Section 7 Consultation for Threatened and Endangered Species Essential Fish Habitat Consultation Marine Mammal Protection Act Consultation	Consultation not initiated until after alternative is selected. To be completed prior to Final Environmental Document (FED).
State Historic Preservation Office	No Historic Properties Affected	As determined on Oct. 21, 2014, in accordance with Caltrans' 2014 Programmatic Agreement.
National Park Service	Wild and Scenic Rivers Section 7 and 4(f) Consultation	Obtain prior to Final Environmental Document (FED) approval
North Coast Regional Water Quality Control Board	Clean Water Act Section 401 Water Quality Certification	Obtain after FED approved.
United States Army Corps of Engineers	Clean Water Act Section 404 Permit for filling or dredging waters of the United States.	Obtain after FED approved.
United States Army Corps of Engineers	Section 10 Rivers and Harbors Act for all structures and work in navigable waters of the United States	Obtain after FED approved.
United States Coast Guard	Section 9 of Rivers and Harbors Appropriation Act	Obtain after FED approved.
California Department of Fish and Wildlife	1602 Agreement for Streambed Alteration	Obtain after FED approved.
California Department of Fish and Wildlife	Section 2080.1 Agreement for Threatened and Endangered Species	Obtain after DED circulation and NMFS consultation.
California Department of Fish and Wildlife	Incidental Take Permit	Obtain after DED circulation
California State Lands Commission	Lands Lease (previous lease number for bridge retrofit:7896.9)	Obtain after FED approved.
California Transportation Commission	CTC vote to approve funds	After FED approved.
California Coastal Commission (consolidated permit jurisdiction)	Coastal Development Permit (CDP) and Coastal Act Federal Consistency Certification	Obtain after FED approved.
Del Norte County	Request for consolidated CDP	Obtain after FED approved.

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Appendices

Figures

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List of Abbreviations and Acronyms

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ac.	acres
ADA	Americans with Disabilities Act
ADL	aerially deposited lead
ADT	Average Daily Traffic
AMMs	avoidance, minimization, and/or mitigation measures
amsl	above mean sea level
APCD	Air Pollution Control District's
APE	Area of Potential Effects
ARB	California Air Resources Board
Basin Plan	Water Quality Control Plan for the North Coast Region
BMPs	Best Management Practices
BSA	Biological Study Area
CAFE	Corporate Average Fuel Economy
CAL FIRE	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CCA	California Coastal Act
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
CDP	Coastal Development Permit
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980
CESA	California Endangered Species Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGP	Construction General Permit
CH_4	methane
CIDH	cast-in-drilled-hole
CIP	cast-in-place
CIP On-alignment	cast-in-place bridge on existing alignment
CIP West	cast-in-place bridge on a new alignment
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Cortese List	Hazardous Waste and Substances Site List
CRHR	California Register of Historical Resources

CSD	Community Services District
CTP	California Transportation Plan
CWA	Clean Water Act
CY	cubic yards
CZMA	Coastal Zone Management Act
dB	decibels
dBA	A-weighted decibel
dbh	diameter at breast height
DED	Draft Environmental Document
DPS	Distinct Population Segments
DSA	Disturbed Soil Area
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIR/EA	Environmental Impact Report/Environmental Assessment
EO	Executive Order
ESA	environmentally sensitive area
ESHAs	environmentally sensitive habitat areas
ESU	Evolutionarily Significant Unit
FCAA	Federal Clean Air Act
FED	Final Environmental Document
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
FTA	Federal Transit Administration
FTIPs	Federal Transportation Improvement Programs
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
H_2S	hydrogen sulfide
HFCs	hydrofluorocarbons
HU	Hydrologic Unit
IGR	Inter-Governmental Review
IPCC	Intergovernmental Panel on Climate Change
IS/MND	Initial Study with Mitigated Negative Declaration
ISAs	Initial Site Assessments
LCFS	low carbon fuel standard
LCPs	local coastal programs
LED	Light Emitting Diode
LEDPA	least environmentally damaging practicable alternative
LMax	maximum sound level
LSAA	Lake and Streambed Alteration Agreement, also referred to as a 1600 permit
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MLD	Most Likely Descendent
MMPA	Marine Mammal Protection Act
$MMTCO_2e$	million metric tons of carbon dioxide equivalent
MND	Mitigated Negative Declaration

MPO	Metropolitan Planning Organization
MS4s	municipal separate storm sewer systems
MUN	municipal and domestic supply
MVM	million vehicle miles
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NES	Natural Environmental Study
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NNL	National Natural Landmarks
NO_2	nitrogen dioxide
NOA	naturally occurring asbestos
NOAA	National Oceanographic and Atmospheric Administration
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NTU	nephelometric turbidity units
NZMS	New Zealand mudsnails
O_3	ozone
OHWM	Ordinary High Water Mark
ONRW	Outstanding National Resource Water
ORVs	Outstandingly Remarkable Values
OSHA	Occupational Safety and Health Act
OTD	Offer to Dedicate
PA	Programmatic Agreement
PAL	Public Agency Lease
Pb	lead
PBF	physical or biological feature
PC	pre-cast
PC West	pre-cast girder bridge on a new alignment
PDT	Project Development Team
PM	Post Mile
PM	particulate matter
PM_{10}	particles of 10 micrometers or smaller
$PM_{2.5}$	particles of 2.5 micrometers and smaller
PRC	Public Resources Code
PS&E	Plans, Specifications, and Estimates
PSIs	Preliminary Site Investigations
RCRA	the Resource Conservation and Recovery Act of 1976
RFID	radio-frequency identification
RHZ	root health zone
ROW	right-of-way
RSP	rock slope protection

RTPs	Regional Transportation Plans
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDC	Seismic Design Criteria
SF_6	sulfur hexafluoride
SHOPP	State Highway Operation and Protection Program
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLR	sea-level rise
SO_2	sulfur dioxide
SOD	sudden oak death
SONCC	Southern Oregon/Northern California Coast
SPL	sound pressure level
sq. ft.	square feet
SR	State Route
SRZ	structural root zone
SSC	Species of Special Concern
SVP	Society of Vertebrate Paleontology
SWMP	Storm Water Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TASAS	Traffic Accident Surveillance and Analysis System
TCE	Temporary Construction Easement
TDM	Transportation Demand Management
THP	Timber Harvest Plan
TMDLs	Total Maximum Daily Loads
TOB	Top of Bank
TPZ	Timber Production Zones
TSCA	Toxic Substances Control Act
TSM	Transportation System Management
U.S. 101	U.S. Route 101
U.S. 199	U.S. Route 199
U.S. EPA	United States Environmental Protection Agency
UBC	Uniform Building Code
USACE	United States Army Corps of Engineers
USC	U.S. Code
USDOT	U.S. Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	U.S. Geological Survey
VIA	Visual Impact Assessment
VMT	vehicle miles traveled
VOCs	volatile organic compounds
WDID	Waste Discharger Identification
WDRs	Waste Discharge Requirements
WIFL	little willow flycatcher
WPCP	Water Pollution Control Program
WQA	Water Quality Assessment
WQOs	Water Quality Objectives
WSRA	Wild and Scenic Rivers Act
YBCU or cuckoo	yellow-billed cuckoo

Chapter 1 Proposed Project

1.1 Introduction

The California Department of Transportation (Caltrans) proposes to replace the existing Smith River Bridge (Caltrans Bridge #01-0020), known as the Dr. Ernest Fine Memorial Bridge (referred to as the Dr. Fine Bridge hereinafter). Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and under the California Environmental Quality Act (CEQA). This project is included in the State Highway Operation and Protection Program (SHOPP) Bridge Rehabilitation Program (Code 201.110).

1.2 Project Location

The project is on U.S. Route 101 (U.S. 101) immediately north of the community of Fort Dick and approximately 10 miles north of Crescent City in Del Norte County, California (Figure 1-1). The total length of the proposed project is 0.7 mile, from the Smith River Overflow Bridge (Caltrans Bridge #01-0046) at Post Mile (PM) 35.8 to Fred D. Haight Drive at PM 36.5. The project is in the United States Geological Survey 7.5-minute Smith River quadrangle in Sections 11 and 12, Township 17 North, Range 1 West, Humboldt Base and Meridian. Geographical coordinates (WGS84) at the center of project area are 41.88° North, 124.14° West.

1.3 Existing Conditions

Built in 1940, the Dr. Fine Bridge is 1,050 feet long and 32 feet wide (Figure 1-2). The existing bridge has two 12-foot lanes, narrow 1-foot shoulders, and 21-inch wide elevated maintenance walkway with non-standard concrete bridge railing (Figure 1-2).

The existing bridge consists of 20 spans (portions between abutments and/or piers) with two bridge types. The south and north ends of the bridge (220 feet long and 70 feet long, respectively) are cast-in-place (CIP)/reinforced concrete and the middle section (760 feet long) consists of riveted steel plate girders with a cast-in-place/reinforced concrete deck (Figure 1-2, Photos 3 and 4). Five piers support the steel girder section of the bridge over water, with each pier having two columns with web walls on H-Piles. The bents supporting the concrete spans at both the south and north ends of the bridge each have three columns of reinforced concrete in a “bent-type” configuration. At the south end, the foundations are cast-in-drilled-hole concrete piles, while the north end has reinforced concrete spread footings. The concrete spans at the south and north ends of the bridge have parabolic shaped soffits.

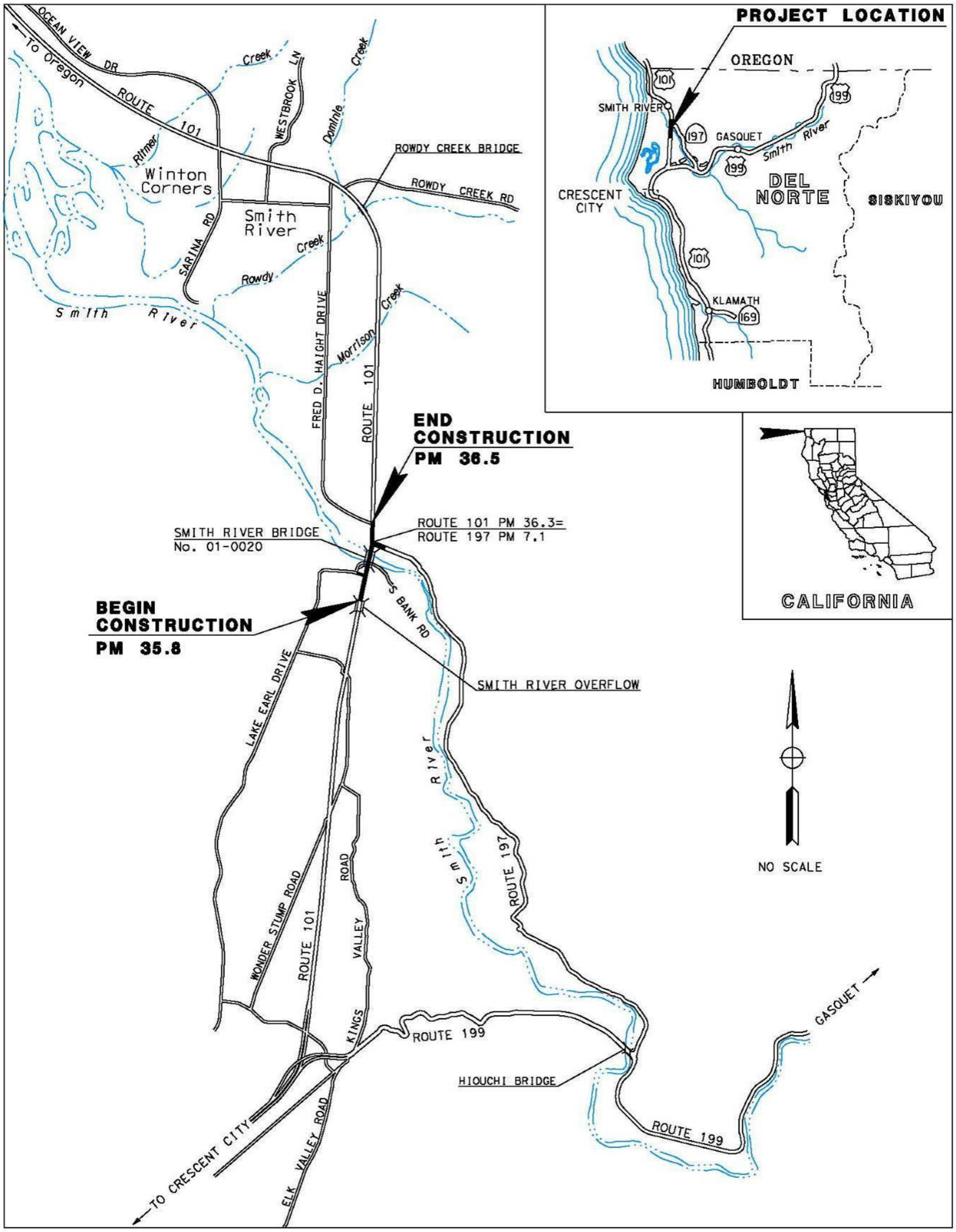


Figure 1-1. Project Vicinity and Location

Photo 1. Looking east toward the Dr. Fine Bridge, which crosses north/south over the Smith River.

Photo 2. Looking north, non-standard concrete bridge rails, narrow shoulders (1-foot), and narrow elevated maintenance walkway (21-inches) are "functionally obsolete" elements.

Photo 3. Existing painted green steel girders and concrete piers spanning the Smith River; looking north from the southern river bank.

Photo 4. Looking west toward the bridge where South Bank Road traverses under the south end of the painted green steel girder section of the bridge.

Figure 1-2. Photos of Existing Bridge

1.4 Purpose and Need

U.S. 101 has significant interregional and interstate importance and is part of the designated Redwood Highway, Pacific Coast Bike Route, and California Coastal Trail. In addition, U.S. 101 is included in the National Highway System and is identified as a High Emphasis Focus Route in the State Interregional Transportation Strategic Plan. It is essential for local residents, businesses, and safety organizations (e.g., police, ambulance, fire, etc.), and for interregional commerce that this stretch of highway have a safe and reliable bridge over the Smith River.

1.4.1 Purpose

The purpose of the project is to improve the safety, connectivity, and reliability of the bridge for hikers, bikers, travelers, commuters, and freight carriers.

1.4.2 Need

The project is needed to address several critical issues associated with the existing bridge constructed in 1940. These include:

1. Steel Degradation—In 2005, a Fatigue Analysis conducted by the Caltrans Office of Structures Maintenance and Investigations Ratings Unit estimated that the remaining service life of the bridge was eight years. The steel's degradation is the result of long-term (74-years) repeated flexing of the structure by the daily use of vehicles. This degradation is similar to how a paper clip will eventually weaken and break if repeatedly bent back and forth. Routine monitoring and maintenance of the Dr. Fine Bridge will not be effective in preventing the continued steel degradation. Caltrans' Fatigue Analysis indicated that the bridge's steel components are "fracture critical," meaning that a break or "fracture" in one of the critical structural components could result in a catastrophic failure of the bridge;

2. Scour—According to an underwater inspection conducted by the Caltrans Office of Structures Maintenance and Investigations, the bridge piers are considered scour critical. Scour is the process of sediment removal from around piers caused by the erosive action of flowing water. Scour critical means that the bridge piers (i.e., foundations within the Smith River) are at risk of being undermined, resulting in bridge pier and foundation failure. Scour also reduces the traffic and seismic load capacities of the bridge, and reduces the bridge's ability to withstand a Maximum Credible Earthquake (the largest earthquake usually expressed in magnitude to be possible in an area);

3. *Seismic Standards*—Seismic retrofit measures were installed on the bridge in 1996, which included the filling in (creating walls) of some of the bents (on land pier), the installation of steel cables along the bridge deck, and the installation of concrete piles at the abutments as a connection point for the newly installed steel cables. The bridge foundations were not reinforced as part of this retrofit project. Due to updated standards since this retrofit occurred, the bridge no longer meets current seismic code requirements; and

4. *Functionally Obsolete*—The bridge is classified as functionally obsolete based on the deck geometry (two 12-foot lanes, 1-foot shoulders and 21-inch elevated maintenance walkway). In addition, the concrete bridge rails do not meet current standards.

Caltrans' Complete Streets—Deputy Directive 64-R2—establishes a policy within the State Highway system that provides for the various needs of travelers. This policy document defines the term "Complete Streets" as "a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, and others." The intent is to ensure travelers of all ages and abilities can move safely and efficiently along a network of Complete Streets. U.S. 101, from Route 1 at Leggett to the California/Oregon state line, is legislatively designated as the "Pacific Coast Bike Route" with only a few non-continuous, alternative routes. The existing Dr. Fine Bridge lacks accessibility for pedestrians and cyclists. This project proposes design standards for Complete Streets through the incorporation of separated pedestrian walkways and increased shoulder widths

1.4.3 Independent Utility and Logical Termini

Independent utility is a term used to describe a project that would be both usable and a reasonable expenditure, even if no additional transportation improvements in the area were made. A logical terminus describes the logical beginning and end for an improvement project, including the beginning and end of its potential effects.

Federal Highway Administration (FHWA) regulations (23 Code of Federal Regulations [CFR] 771.111(f)) state that an action evaluated shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;

2. Have independent utility or independent significance. It would be usable and require a reasonable expenditure even if no additional transportation improvements in the area were made; and

3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Based on the scope of the project, the project would have independent utility and logical termini. The project would replace an existing structure located on an existing highway. Although transportation improvements might be made in the project area in the future, the bridge would be functionally independent and would not require any other projects be implemented. The bridge design would not impede other potential transportation projects in the area.

1.5 Project History

Caltrans is in the process of environmental planning for replacement of the Dr. Fine Bridge. When the project was identified for funding, it was determined that the potential impacts associated with the project necessitated the preparation of an Environmental Impact Report (EIR). Given this, Caltrans submitted a Notice of Preparation (NOP) of an EIR to the State Clearinghouse on October 25, 2010 (State Clearinghouse Number 2010102037; Appendix D).

The project description in the NOP included a three-lane bridge, with the third (center) lane being a 12-foot-wide acceleration lane for left turning movements from State Route (SR) 197 (SR 197) and Lake Earl Drive onto U.S. 101. In addition, in the NOP the new bridge alignment was identified as being either to the east or west of the existing bridge's alignment. After the NOP was circulated, the project was modified to instead replace the existing two-lane bridge with a new two-lane bridge. The third (center) lane was removed from the project as a result of discussions with the California Coastal Commission (CCC). Because there is no existing accident data to support the need for a third lane, the CCC would have difficulty permitting it. It was also determined that there was not adequate length available for a third lane to allow safe merging distance between the intersections at either end of the bridge.

In June 2017, Caltrans circulated a Draft Environmental Document (DED) consisting of an Initial Study with Mitigated Negative Declaration (IS/MND)/Environmental Assessment (EA) that evaluated impacts from one preferred build alternative (Existing Alignment CIP using a Jack and Slide Detour, i.e., "Jack and Slide East" or Alternative 4 in the 2017 IS/EA, Alternative 3 in this EIR) and the no-build alternative. In response to agency comments received on the 2017 IS/EA, Caltrans has prepared this EIR to fully evaluate multiple alternatives for the bridge replacement, including two alternatives on a new alignment that were included in the 2017 IS/EA as *Alternatives Considered but Eliminated from Further Discussion* and an optional detour construction method for the Existing Alignment CIP bridge.

This EIR addresses the specific questions and concerns identified by each agency in their comments on the 2017 IS/EA. In addition, this EIR addresses the central questions shared by the agencies, including the recommendations that Caltrans should develop an EIR in order to thoroughly assess the alternatives (cast-in-place vs. pre-cast construction; on alignment vs. off alignment) to identify the least environmentally damaging practicable alternative.

1.6 Project Description

The project is on U.S. 101 in Del Norte County from postmile (PM) 35.8 to 36.5, approximately 10 miles north of Crescent City. Within the limits of the project, U.S. 101 is a conventional two-lane, undivided highway. Presently, Dr. Fine Bridge has two 12-foot lanes, 1-foot non-standard shoulders, and a 21-inch elevated maintenance walkway. The new two-lane bridge would have two 12-foot lanes, 8-foot shoulders, and a 6-foot- wide separated pedestrian walkway. The purpose of the project is to improve the safety, connectivity, and reliability of the bridge for hikers, bikers, travelers, commuters, and freight carriers. The project is needed to address several critical issues associated with the safety and structural integrity of the existing bridge which was constructed in 1940.

Project alternatives were developed to meet the identified purpose and need of the project, while avoiding or minimizing environmental impacts.

1.7 Alternatives

This section describes the build and no-build alternatives. Information about alternatives considered, but eliminated is included below in Section 1.9, *Alternatives Considered but Eliminated from Further Discussion*.

When the need for a roadway improvement is identified on a portion of a state route, a Project Development Team (PDT) is formed. The PDT, which is a combination of technical professionals at Caltrans, recommends studies, timetables, alternatives, types of environmental documentation, and the feasibility of project impact mitigation. The team also ensures state and federal requirements for project development have been met. The PDT proposes the most feasible alternatives to study and considers the cost, schedule, and environmental impacts of the project.

The PDT has developed three build alternatives and a No-Build Alternative for consideration.

1. Cast-in-place bridge on a new alignment to the west of existing bridge (CIP West).

2. Pre-cast girder bridge on a new alignment to the west of the existing bridge (PC West).

3. Cast-in-place bridge on the existing alignment (CIP On-alignment), with two construction options (3A and 3B).

1.7.1 Common Design Features of Build Alternatives 1–3

Build alternatives 1–3 propose to replace the physically deficient and functionally obsolete Dr. Fine Bridge with a two-lane structure, with shoulders and a pedestrian path which would meet current design standards and demands. The proposed bridge would be 51 feet wide and would include two 12-foot lanes, two 8-foot shoulders, a 6-foot-wide separated pedestrian walkway with a 1-foot-wide pedestrian rail (on the west side only), and two 2-foot-wide bridge rails. The pedestrian rail on the west side will have a decorative pattern and the east side bike rail will have a decorative portion mounted above (Figure 1-3).

1.7.1.1 Bridge Railing

The new bridge would have barrier railing that is "see through" and could be powder coated with various colors. An artistic rendering of the barrier railing on Figure 1-3 below illustrates a dark green color. The bridge railing would have a design motif that reflects a tribal pattern in coordination with applicable Northwestern California tribes (Tolowa Dee-Ni' Nation and Elk Valley Rancheria) and subject to approval by the CCC. Refer to Figure 1-3 below for an example of bridge railing and tribal design motif.

Figure 1-3. Photo-simulations of the Proposed Pedestrian Bridge Railing and Design Motif Known as "Friendship Design Pattern"

1.7.1.2 Retaining Walls

Retaining walls would be constructed to minimize project area impacts. Without the walls, fill slopes extending from the new edge of roadway would impact a larger area. Using walls minimizes the project area when compared to cut banks which would need to be extended farther back to achieve bank stability.

Approximate retaining wall lengths are discussed under Section 1.7.2, *Unique Features of Build Alternatives*.

1.7.1.3 Stormwater Treatment

The existing impervious surface area within the project limits is 4.6 acres. Under Alternatives 1 and 2, the new bridge and roadway after construction would constitute approximately 5.37 acres of impervious surface; the approximate net increase in impervious surface would be 0.77 acre. Under Alternative 3, the new bridge and roadway after construction would constitute approximately 4.95 acres of impervious surface, with a net increase in impervious surface of approximately 0.35 acre. Under all build alternatives, the project includes water quality features to treat both sheet flow from paved areas as well as concentrated flow volumes collected from roadside ditches and paved areas.

The project would include the use of permanent stormwater treatment Best Management Practices (BMPs) due to increases in impervious roadway surface and associated 401 Certification Program of the North Coast Regional Water Quality Control Board (RWQCB). Design Pollution Prevention BMPs would be incorporated into the project where appropriate to minimize impacts on water quality by preventing erosion and stabilizing disturbed soil areas. Treatment BMPs will provide water quality benefits including the settlement of soil particles, pollutant removal, and increase stormwater retention times to promote infiltration. In addition to the construction of biostrips and bioswales, the following pollution prevention measures would be included in the project design for the build alternatives:

- Slopes would be graded to 1.5:1 and vegetated to blend with the natural terrain and promote sheet flow and infiltration;
- Drainage ditches and channels would be vegetated where feasible; and,
- Re-vegetation would utilize seed mixture mulch and compost materials to promote growth and infiltration.

Runoff from impervious roadway surfaces along the roadway and bridge approaches would be discharged as sheet-flow to biofiltration strips and/or biofiltration swales. Biofiltration strips are vegetated land areas over which stormwater flows as sheet flow. Biofiltration swales are vegetated channels, typically configured as trapezoidal or v-shaped channels that receive and convey stormwater flows from the roadway. Pollutants are removed by filtration through vegetation, sedimentation, adsorption to soil particles, and infiltration through soil.

1.7.1.4 Existing Drainages

There are several existing culverts within the project area. The existing 18- to 24-inch diameter cross culverts on U.S. 101 at PM 36.30 and PM 36.33 would be replaced and rebuilt. These culverts are at the U.S. 101/SR 197 intersection and just north of the intersection. The drainage inlets at PM 36.30 and PM 36.33 would be modified or relocated to conform to the completed highway alignment.

There is a 36-inch reinforced concrete culvert that crosses South Bank Road adjacent to the west side of the existing bridge. This culvert would be temporarily extended for construction activities and would be reestablished after construction to the pre-project configuration. Stabilization methods, per BMPs, would be used to minimize potential erosion and sedimentation.

1.7.1.5 Construction Equipment

Typical equipment used for construction and demolition includes pavers, cranes, hoe rams, pile drivers, vibratory hammers, excavators, backhoes, hauling and dumping trucks, compactors, portable generators, boom trucks, concrete trucks, saws, pumps, jackhammers, site trailers, storage boxes, and mobile filtration boxes.

1.7.1.6 Construction Schedule

In-water work windows are likely to be from June 15 through October 15. Specific dates of in-water construction would be determined during the Section 7 Endangered Species Act consultation with the National Oceanic and Atmospheric Administration – National Marine Fisheries Service (NMFS) and permit requirements via California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement, United States Army Corps of Engineers (USACE) Nationwide or Individual Permit, CCC Coastal Development Permit, and North Coast RWQCB 401 Water Quality Certification.

Exact scheduling of construction activities would be determined by the contractor, but within the environmental limitations and permit requirements. Project plans and specifications tell the contractor the end product; however, the contractor determines the final construction means and methods. Actual methods and associated details are determined after the contractor is selected. After successful bidding and award, the contractor would submit a schedule and methods of construction to be reviewed and approved by Caltrans Construction personnel and the PDT. Water pollution control scheduling and methods, such as construction dewatering, would be specified in the Storm Water Pollution Prevention Plan (SWPPP) for the project. The RWQCB would review the Notice of Intent and associated documents, including the SWPPP, and issue a Waste Discharger Identification (WDID) number authorizing permit coverage of the project under the Construction General Permit (CGP).

Based on the professional judgment of engineers and construction personnel, reasonable assumptions have been made about the construction methodology to be evaluated in this environmental analysis.

Night work during certain activities is anticipated for all build alternatives. The bridge approach roadway work under all alternatives would require night lighting for a maximum of two weeks (not consecutively). Limiting work to daylight hours would increase construction time and potentially lead to an additional construction season.

1.7.1.7 Utility Relocation

There are four utilities within the project area. They include Frontier and Charter phone and cable, Pacific Power, and a U.S. Geological Survey (USGS) Gage Station. Currently buried Frontier and Charter cables approach both ends of the structure and then cross the river on the west side as overhead lines. These overhead cables would have to be temporarily relocated during the project, and then rerouted after the project is completed.

The new bridge would be built to accommodate some utilities (Frontier and Charter) through conduits inside the bridge. All utility work would be handled by the utility companies involved. Installation of new temporary and permanent poles would likely be required. There are also buried fiber optic cables that approach the project area from the east along SR 197 and on the west along US 101; both would need to be temporarily relocated.

Pacific Power crosses the project area on the north end of the structure and there are two poles in conflict with the proposed improvements. Power to these poles would have to be rerouted for the duration of the project, although power would be maintained around the structure to service street lights and the temporary bridge bike warning system.

There is also an electrical service drop for the USGS Gage Station on the northeast side of the structure that would be removed during construction, then replaced after the project. The

USGS Gage Station would be temporarily relocated to a suitable location, to be determined by USGS, and then remounted to the new bridge after completion.

1.7.1.8 Clearing and Grubbing

The contractor would remove all vegetation within the right-of-way (ROW) and temporary construction easements necessary for construction except for certain trees and environmentally sensitive habitat areas (ESHAs) that require preservation. Trees and ESHAs that can be preserved would be protected from injury by the contractor. In compliance with the Migratory Bird Treaty Act, vegetation clearing would be limited to between September 1 and February 28 in any construction year or pre-construction nesting bird surveys would occur. Vegetation that is cleared and grubbed may be collected and processed into duff by grinding or chipping. Duff may be stockpiled until placed on the planned revegetation areas. Additionally, all disturbed areas would receive appropriate erosion control measures which would be a combination of hydroseeding, straw, and fiber application. The contractor must clear and grub all areas where the highway, bridge, and road approaches are to be constructed. Access and staging areas would be cleared as necessary to move and store material and equipment around the project site. Equipment used to clear and grub vegetation would likely include backhoes, chain saws, mowers, chippers, and hand tools. Access roads would likely be graded with a backhoe.

1.7.1.9 Temporary Stream Crossing

There is a stream located to the northwest and a drainage channel to the southwest of the existing bridge. There are also streams on the northeast side of the existing bridge.

For the drainage channel southwest of the bridge, a temporary channel crossing would be necessary for equipment access and temporary roadway realignment of South Bank Road. Sections of the channel both upstream and downstream from an existing 36-inch culvert under South Bank Road may need temporary culverts; these would be covered with clean, imported gravel and filter fabric. This would provide a passable surface for equipment and vehicles to cross. The filter fabric would prevent small gravel and sediment from entering the drainage channel. The temporary drainage channel crossing would be installed as permitted, when the drainage channel is dry, and would remain in place until construction work is complete.

Water from construction activities in the cofferdams could be transferred by pumps and a double-walled dewatering pipe to an infiltration basin proposed on the property approximately 450 feet downstream of the bridge, on the south side of the Smith River. The pipe would be placed along an access road, between the bridge and the infiltration basin and staging area.

There would also be a temporary access road built across the bottom of the northwest stream. Access is needed for a temporary gravel working berm that would extend out into the river from the north side under all build alternatives. Under Alternatives 1 and 2, access would also be needed for viaduct and retaining wall construction, so a larger portion of the stream would be temporarily altered for access.

1.7.1.10 Construction Trestles and Temporary Gravel Berms

Temporary construction trestles and temporary gravel berms would be used for construction activities of the build alternatives, removal of the three existing piers in the river, and construction of new pier(s) in the river. The temporary trestles and gravel berm would provide access for cranes, construction vehicles, other equipment, materials, and workers.

Temporary construction trestles would be built to span the western pearlshell mussel bed and thalweg (the deepest part of the channel) along the southern side of the river. One 40-foot wide construction trestle will be needed for the construction of the new bridge and will be located downstream of the existing bridge. During demolition activities, a construction trestle also would be used upstream of the existing bridge. The piles for the construction trestles are typically 2-foot (24-inch) diameter steel shell piles, but may be up to 30-inches, W-Section steel beams, or HP steel piles. Piles would be installed as deep as possible with a vibratory hammer; however, it is anticipated that the piles would also need to be driven to get them to the required final depth. For the construction trestle spanning the western pearlshell mussel bed, it is estimated that six 30-inch diameter steel shell piles would be required downstream and six upstream. It is assumed the construction trestle piles would remain in the river year-round for the duration of the project. However, the deck and cross beams (i.e., stringers) would be removed prior to the winter season (i.e., by October 15 in each construction year) and reinstalled each subsequent year as needed.

The remainder of the Smith River would be accessed using temporary gravel berms. Temporary gravel berm configurations would change each year depending on in-water construction activities. The estimated temporary gravel berm footprints in square feet (sq. ft.) and acres (ac.), as well as volume in cubic yards (CY), of gravel required under each build alternative are provided in Table 1-1.

The edges of the gravel berm would be contained using sheet piles, k-rail, or another method proposed by the contractor. Additionally, there would be extensions of the gravel berm, approximately 30 feet wide and roughly perpendicular to the bridge, for access to pier locations. Access to the temporary gravel berm and trestle would likely be from a temporary

Table 1-1. Temporary Gravel Berm Footprint and Volume for Each Build Alternative

Construction Season	Alternative 1	Alternative 2	Alternative 3A	Alternative 3B
Season 1	6,000 square feet (sq. ft.) 0.1 acre 1,156 cubic yards (CY)	11,200 sq. ft. 0.3 acre 1,979 CY	27,900 sq. ft. 0.6 acre 5,233 CY	N/A
Season 2	38,000 sq. ft. 0.9 acre 7,430 CY	38,000 sq. ft. 0.9 acre 1,156 CY	38,000 sq. ft. 0.9 acre 7,852 CY	45,900 sq. ft. 1.1 acres 9,856 CY
Season 3	38,450 sq. ft. 0.9 acre 7,491 CY	6,000 sq. ft. 0.1 acre 5,522 CY	38,450 sq. ft. 0.9 acre 7,919 CY	38,000 sq. ft. 0.9 acre 7,852 CY
Season 4	N/A	N/A	N/A	14,400 sq. ft. 0.3 acre 2,844 CY
Total	82,450 sq. ft. 1.9 acre 16,076 CY	87,650 sq. ft. 2.0 acres 14,931 CY	104,350 sq. ft. 2.4 acres 21,004 CY	98,300 sq. ft. 2.3 acres 20,552 CY

access road on the northwestern side of the bridge. See Appendix B for estimated general layout configurations for each alternative.

Clean, washed, spawning sized gravel would be used to construct the bed of the gravel berm, with any further specifications to be determined by permitting requirements. The temporary gravel berms would be removed each year prior to October 15 and reinstalled each subsequent year.

1.7.1.11 In-Water Activities

All in-water activities would likely occur between June 15 and October 15. Final dates of in-water work would be determined through the consultation and permitting process with input and guidance from resource agencies. In-water activities may include the following:

- Installation of new bridge pier foundations would be installed by oscillation methods, however, if obstacles are encountered, center relief drilling or other methods may be needed. Sheet piles (vibrated installation) would be used for cofferdams for new piers and demolishing existing in-river piers.
- Installation of temporary construction trestles and falsework supports spanning the western pearlshell mussel bed (two approximately 40-foot spans): it is estimated 18 piles would be needed (three rows of six piles) downstream and 12 piles upstream (3 rows of 4 piles) for the construction trestle and falsework supports necessary to construct both the new bridge as well as demolish the existing bridge. The southern-most piles are not anticipated to be in the water during summer flows. The piles may be a combination of H-Piles and steel shell piles.
- Installation of a temporary gravel berm to allow access under the existing bridge and around piers during construction is necessary to construct both the new bridge as well as demolish the existing bridge. Construction trestle and gravel berms would provide access for cranes, construction vehicles, materials, and other equipment.

See Section 1.7.2, *Unique Features of the Build Alternatives*, for further in-water activity information.

During impact pile driving and demolition activities (hoe ram operations), hydroacoustic monitoring would ensure compliance with the terms and conditions resulting from Section 7 Endangered Species Act Consultation with NMFS and CDFW CESA permitting. Where impact pile driving is required, hydroacoustic monitoring would be performed to determine compliance with established objectives (e.g., distances to cumulative noise thresholds) and identify corrective actions to be taken should the thresholds be exceeded.

1.7.1.12 Dewatering Operations

Construction dewatering of the project site would be required to remove water from the cofferdams and piles as needed during pier construction and during removal of existing pier footings. The retaining wall on the northwest side of the river likely would also need dewatering as there is water percolation to the surface at this location. This water will be stored temporarily in an on-site tank on the northwest side of the river, and then will be transferred via truck to the infiltration area on the southwest side of the river. A separate permit for dewatering (Low Threat Discharge Permit) may be required from the RWQCB, which would specify testing, monitoring, and discharge requirements if the contractor proposes to discharge directly into receiving waters (i.e., Smith River). Water generated from the dewatering operations would be first contained, tested and treated for pH, if required, and then discharged for infiltration to the dewatering basin. If permitted, water may also be used for onsite dust control.

Caltrans has identified a potential location for an infiltration basin for dewatering activities located to the south of the Smith River and west of the bridge on a parcel that would also be used for staging. The parcels proposed for staging are currently used for grazing and hay production and are zoned Agricultural. The potential dewatering area is approximately 1.0 acre. The final dimensions of the dewatering area will be determined by the contractor. Water from the construction site would be moved to an infiltration basin via a pipe. Within the proposed infiltration area, the contractor would likely need to excavate a basin to a necessary depth, length, and width, depending on capacity needed (i.e., infiltration rates, etc.). The excavated soils could be used to construct a berm around the basin to increase capacity. Access to the proposed dewatering area would be through access roads to the staging area. While another method of dewatering could be proposed as part of the Construction Dewatering Plan, the contractor would be required to remain within the constraints of the permit conditions.

1.7.1.13 Bridge Demolition

The contractor would be required to prepare a Bridge Demolition Plan for review and approval by the Caltrans Resident Engineer, as is standard practice. The contractor would address any nesting birds before demolition could commence. This could include conducting regular surveys for nesting birds on the bridge (and subsequent removal of nesting materials before nests are established) and/or bird exclusion.

A temporary containment system would be constructed to prevent debris material from falling into the Smith River. The containment system may include steel or timber posts and girders, timber decking, and heavy tarps.

The temporary gravel berm and construction trestle would be used to support the temporary containment system. Equipment used to install the temporary containment system and trestle would likely include a crane and hydraulic hammer.

Portions of the existing reinforced concrete bridge may be permitted to drop to the ground (i.e., on the temporary gravel berms outside the wetted channel), but the contractor would be required to prevent material from entering the Smith River. Traffic control would be implemented on South Bank Road during bridge demolition as needed. Because the existing steel diagonal bracing and girders have been painted with lead based paint, the contractor would be required to submit a Lead Compliance Plan for handling, removing, and disposing residue containing lead from paint.

The existing steel bracing would be cut and removed in sections. The steel girders would be cut and removed in portions with a crane positioned on the temporary gravel berm or leveled ground surface.

There are a total of 19 foundations supporting the existing bridge: 14 concrete bents and 5 piers, 3 of which are below the Smith River Ordinary High Water Mark (OHWM). There are also 2 abutments and seismic retrofit piles on land to be removed. The concrete columns and foundations of the 14 bents that are outside the river channel would be removed. Excavations for the bents would be backfilled with native material and graded to finish grade. The 5 piers would be removed by removing the pile caps and cutting off the existing steel H-piles below channel bottom at a depth of two to three feet below the surface. Cofferdams would be required for dewatering pier removal areas.

Materials generated from the bridge removal would become the property of the contractor and recycled per Caltrans' standard provisions. All material would be disposed at an appropriately permitted facility.

1.7.1.14 Grading and Fill

Grading and fill activities are proposed to tie in the proposed roadway with the existing U.S. 101 roadway geometry. Roadway improvements at the north and south ends of the proposed bridge are also proposed. Roadway improvements would include widening the shoulders, constructing retaining walls, and extending the bridge's pedestrian walkway, steel railing, and pedestrian rail.

1.7.1.15 Revegetation and Plant Establishment

After all construction materials are removed, the site would be restored to a natural setting by grading, placing erosion control, and replanting with native vegetation. Replanting may be subject to a plant establishment period as defined by permits, which would require Caltrans to monitor successful revegetation of disturbed areas.

1.7.1.16 Public Access

There is currently informal public access under the existing bridge on the southern bank. Current informal access is both vehicular, including boat launching, and pedestrian. During construction, access would be prohibited. Post construction, vehicle access is proposed to be prohibited by installation of boulders along South Bank Road. Pedestrian access would still be available.

Prohibiting vehicle access would be beneficial to the western pearlshell mussel bed that is located under the existing bridge along the southern side of the river. The mussel bed extends both upstream and downstream of the existing bridge. Benefits of prohibiting access include: reducing direct disturbance to the edge of the channel and substrate near the mussel bed and increased riparian vegetation and reduced erosion due to vegetation regrowth in the area that is currently denuded due to informal dirt road used for vehicle access. Prohibiting access may also limit the amount of garbage and refuse that is currently being left on the bank below OHWM. New signage would be installed directing users to vehicular access points nearby and is discussed later in this document.

1.7.1.17 Project Features, Standard Measures, and Best Management Practices Common to All Build Alternatives

Under CEQA, agencies must adopt mitigation measures or alternatives to substantially lessen the significant effect, if feasible, before approving the project (California Public Resources Code [PRC] Sections 21002, 21002.1.). Measures may also be adopted, but are not required, for environmental impacts that are not found to be significant (14 California Code of Regulations [CCR] 15126.4(a)(3)).

For clarity, this document refers to incorporated measures that are prescriptive and sufficiently standardized to be generally applicable, and do not require special tailoring to a specific project, as "Project Features, Standard Measures, and Best Management Practices" as discussed in each section. Measures proposed to reduce impacts that are potentially significant without mitigation, but are not sufficiently standardized to be called Standard Measures or Construction BMPs, are referred to as "Mitigation Measures." The following lists the project features, standard measures, and best management practices for the build alternatives.

Land Use – Wild and Scenic Rivers

LU-1: **New Bridge Design.** Compared to the existing bridge, the new bridge would have fewer piers in the river channel and would provide a less obtrusive and more visually appealing structure.

LU-2: **Aesthetic Elements**. The new bridge would have aesthetic elements added, including tribal designs incorporated into the railing and retaining walls. Retaining walls would be stained an earthen color that blends with the surrounding environment.

LU-3: Public Outreach. Outreach would be conducted to ensure the public is aware that river access would be limited during construction activities. Outreach to the boating community would be conducted before and during construction to notify users of river closures.

Farmlands/Timberlands

FT-1: **Construction Staging.** Construction staging areas would be limited to the minimum area necessary.

FT-2: **Restore Temporarily Disturbed Agricultural Areas.** Temporarily disturbed agricultural areas would be revegetated and soils that may have been compacted would be loosened upon project completion.

Utilities and Emergency Services

UE-1: Notify Emergency Response Providers. All emergency response agencies in the project area would be notified of the project construction schedule. Access to U.S. 101 throughout the construction period would be available with the exception of the temporary closure proposed under Alternative 3A.

UE-2: Coordinate with Utility Providers. Caltrans would coordinate with utility providers before relocation of any utilities to ensure potentially affected utility customers would be notified of possible short-term service disruptions before relocations.

UE-3: **Street Lights and Bridge Bike Warning Systems during Construction**. Power to the Pacific Power poles would be rerouted for the project duration and maintained around the structure to service street lights and bridge bike warning systems.

UE-4: Relocate USGS Gage Station. Caltrans would coordinate with the USGS to relocate the gage station.

Traffic and Transportation

TT-1: **Maintain Pedestrian and Bicycle Access.** Pedestrian and bicycle access would be maintained during construction.

TT-2: **Maintain Access to Driveways and Public Roads**. The contractor would be required to minimize any access delays to driveways or public roadways within or near the work zones.

TT-3: Transportation Management Plan. A Transportation Management Plan would be applied to the project and would include the following measures:

- Bicycles and pedestrians would be accommodated through the work zone at all times. Signage would be used to alert vehicles of the possible presence of bicyclists. During reversing traffic control, bicyclists would be instructed to join the vehicle queue.
- The public would be notified of any route closures and/or detours.
- Any emergency service agency whose ability to respond to incidents would be affected by any lane closure would be notified prior to the closure.
- Construction activities would be coordinated with the local busing system (including school buses and public systems) to minimize impact on bus schedules.
- Access to businesses, side roads, and residences would be maintained at all times.

Visual/Aesthetics

VA-1: **Bridge Aesthetic Treatment.** Aesthetic treatment to the bridge would be included, such as Tolowa Dee-Ni' Nation and Elk Valley Rancheria Tribal patterns, to address context sensitivity.

VA-2: Revegetate Riparian and Wetland Areas. Riparian and wetland areas affected would be revegetated with regionally appropriate native plants.

VA-3: Restore Temporary Access and Staging Areas. Any temporary access roads, removed roadway, or staging areas would be restored to a natural contour and revegetated with appropriate native plants. Plant species and methods for installation would be developed by the project landscape architect and revegetation specialist.

VA-4: **Bridge Railing Design.** See-through railing would be installed to provide more visibility to the surrounding natural elements. Railings would be painted or stained with a color that enhances visual character and memorability of the bridge.

VA-5: Avoid and Minimize Tree Removal. The removal of established trees and vegetation would be avoided and minimized, where feasible. Existing trees of significant size and maturity would be preserved and protected during construction, where feasible. Environmentally sensitive areas (ESA) would have Temporary High Visibility Fencing (THVF) installed to demarcate areas where vegetation would be preserved and root systems of trees would be protected.

VA-6: Retaining Wall Design. Design and aesthetic elements would be incorporated into the retaining walls, such as Tolowa Dee-Ni' Nation and Elk Valley Rancheria Tribal patterns and be colorized or painted with earthen hues to blend with the natural surrounding environment.

VA-7 : Guardrail Terminals. Bury guardrail terminals when feasible, otherwise use in-line end-section if appropriate.

VA- 8: Construction Lighting. Limit construction lighting within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

Cultural Resources

CR-1: **Unexpected Discovery of Cultural Materials.** If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be stopped until a qualified archaeologist can assess the nature and significance of the find in consultation with the State Historic Preservation Officer. If significant, the provisions outlined in 36 CFR800.13 would then be followed.

CR-2: Procedures for Human Remains. If human remains are discovered, State Health and Safety Code 7050.5 states that further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to California Public Resource Code (PRC) 5097.98, if the remains were thought to be Native American, the coroner would notify the Native American Heritage Commission (NAHC) which would then notify the Most Likely Descendent (MLD). Further provisions of PRC 5097.98 are to be followed as applicable.

CR-3. Tribal and Archaeological Monitoring. An archaeological and tribal monitor will be present during all ground-disturbing construction activities, consistent with the Monitoring Plan adopted by Caltrans (Caltrans 2019b).

CR-4: **Shipwrecks.** If a shipwreck is discovered during construction, Caltrans would consult with the State Lands Commission, as the title to all abandoned shipwrecks, archaeological sites, and historic or cultural resources on or in the tide and submerged lands of California is vested in the state and under the jurisdiction of the State Lands Commission (PRC 6313). The final disposition of archaeological, historical, and paleontological resources recovered on state land under the jurisdiction of the State Lands Commission must be approved by the State Lands Commission.

Hydrology and Floodplain

HF-1: **Remove Gravel Berms and Construction Trestle Decks.** Temporary construction trestle decks and gravel berms would be removed from the river prior to October 15 each year.

HF-2: **Debris Management Plan.** Caltrans will require the contractor to prepare and implement a Debris Management Plan. This plan would require the contractor to conduct inspections of the construction site on a regular basis as well as after major storm events to monitor debris loading and implement measures, as determined feasible, to remove debris that poses a threat to temporary and permanent infrastructure and channel/bank stability. Measures would include the use of onsite equipment (e.g., cranes) to dislodge or remove debris caught on project-related structures in the river, when site conditions allow the safe removal of debris.

Water Quality and Storm Water Runoff

WQ-1: Prepare and Implement SWPPP. The project would comply with the Provisions of the current Caltrans Statewide National Pollution Discharge Elimination System (NPDES) Permit (Order 2012-0011-DWQ), which became effective July 1, 2013, and the Construction General Permit (Order 2009-0009-DWQ, as amended). Before any ground-disturbing activities, the contractor would prepare a Storm Water Pollution Prevention Plan (SWPPP) that includes erosion-control measures and construction waste containment measures so that waters of the State are protected during and after project construction. The SWPPP would identify the sources of pollutants that may affect the quality of storm water; include construction site BMPs to control sedimentation, erosion, and potential chemical pollutants; provide for construction materials management; include non-storm water BMPs; and include routine inspections and a monitoring and reporting plan. All construction site BMPs would follow the latest edition of the Storm Water Quality Handbooks: Construction Site BMPs Manual to manage construction-related activities, materials, and pollutants in the watershed. The project SWPPP would be continuously updated to adapt to changing site conditions during the construction phase.

WQ-2: Pollution Prevention and Design Measures. The project would incorporate pollution prevention and design measures consistent with the 2016 Caltrans Storm Water Management Plan to meet Water Quality Objectives (WQOs). This Plan complies with the requirements of the Caltrans Statewide NPDES Permit (Order 2012-0011-DWQ).

WQ-3: Prepare and Implement Dewatering Construction and Management Plan. A Dewatering Construction and Management Plan would be prepared to ensure the dewatering area is appropriately sized and managed for the volume of water generated and discharged.

WQ-4: Permanent BMPs to Treat Operational Stormwater Runoff. To treat storm water runoff, permanent treatment BMPs would be incorporated into the project design during the final project design phase to the maximum extent practicable. For example, bioswales and/or biostrips are proposed to be incorporated to promote retention and treat runoff prior to discharge.

WQ-5: Implement Debris Containment System. Under all build alternatives, construction and demolition debris would be prevented from falling or otherwise entering the river. The contractor shall prepare a Debris Containment Plan, detailing proposed temporary containment systems that would be used to prevent falling debris from entering the river during bridge demolition and bridge construction. The containment system may include steel or timber posts and girders, timber decking, and heavy tarps. Should any construction debris enter the river, material would be removed as soon as possible.

Geology/Soils/Seismic/Topography

GS-1: Erosion Control BMPs. The project would be designed to minimize slope failure, settlement, and erosion using recommended construction techniques and BMPs.

GS-2: Seismic Design Elements. To address potential seismic movement, isolation bearings would be used for CIP bridge design (Alternatives 1 and 3) and standard energy dissipaters would be used for PC bridge design (Alternative 2).

GS-3: Retaining Walls and Soldier Pile Walls. Retaining walls and soldier pile walls would be incorporated into project design to avoid large volumes of fill or cut banks.

Paleontology

PA-1: Unexpected Discovery of Paleontological Resources. If paleontological resources are discovered during excavation, earth-moving activity within and around the immediate discovery area would be diverted until a qualified professional paleontologist can assess the nature and significance of the find. If the resource is determined to be significant, monitoring and mitigation would be required.

Hazardous Waste and Material

HW-1: Lead Compliance Plan. The contractor(s) would prepare a project-specific Lead Compliance Plan (8 CCR 1532.1, the "Lead in Construction" standard) to reduce worker exposure to lead-impacted soil and lead-containing paint. The plan would include protocols for environmental and personnel monitoring, requirements for personal protective equipment, other health and safety protocols and procedures for the handling of lead impacted soil, and requirements for addressing and disposal of lead-containing paint in traffic striping and on the existing bridge.

HW-2: Hazardous Air Pollutants Permit. A National Emissions Standards for Hazardous Air Pollutants permit is required from the North Coast Unified Air Quality Management District for bridge demolitions.

HW-3: Dust Control Plan. A Dust Control Plan would be required and provided by the contractor to address naturally occurring asbestos (NOA).

HW-4: Asbestos Compliance Plan. An Asbestos Compliance Plan would be required and would be provided by the contractor.

HW-5: Treated Wood Waste. Caltrans Treated Wood Waste Standard Specification would be used which includes requirements for handling, storing, transporting, and disposing of treated wood waste.

Air Quality

AQ-1: Air Pollution Control. Air Pollution Control would be implemented per Caltrans Standard Specification 14-9.02 which requires compliance with all air pollution control rules, regulations, ordinances, and statutes that apply to work performed under contract, including the North Coast Unified Air Quality Management District regulations and local ordinances.

AQ-2: Dust Control Measures. Dust Control would be implemented per Caltrans Standard Specification 14-9.03 which prevents and alleviates dust by applying water, dust palliative, or both, and by covering active and inactive stockpiles. A Dust Control Plan will be developed documenting sprinkling, temporary paving, speed limits, and timely re-vegetation of disturbed slopes as needed to minimize construction impacts on existing communities. Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used. All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust during transportation. Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce dust emissions.

AQ-3. Construction Equipment. Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by 17 CCR 93114. To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.

Noise

NO-1: Minimize Construction Noise. In order to avoid exceeding 86 A-weighted decibel (dBA) maximum sound level (LMax) at 50 feet from the job site activities during nighttime hours, the following could be implemented to minimize noise under direction from the Resident Engineer: changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.

Natural Communities

NC-1: ESA Fencing. The contractor would be required to place temporary ESA fencing along the boundaries of all riparian, wetland, or other environmentally sensitive areas at the direction of the Resident Engineer and biologist to avoid impacts on sensitive habitats adjacent to the project footprint. The removal of established trees and vegetation would be avoided and minimized, where feasible. Where it is possible to save and preserve existing trees (of significant size and maturity), extreme care and caution would be implemented during the construction phase. ESA fencing would be installed to demarcate areas where vegetation would be preserved and root systems of trees would be protected.

NC-2: Restoration of Temporary Impact Areas. After all construction materials are removed, the project area would be revegetated with native vegetation. All temporarily affected wetland and riparian areas would be restored to pre-existing conditions. Native vegetation will be replaced in-kind to reestablish the area to pre-project conditions. Replanting would be subject to a plant establishment period as defined by project permits, which would require Caltrans to adequately water plants, replace invasive and otherwise unsuitable plants, and control pests. Caltrans would implement a program of invasive weed control in all areas of soil disturbance caused by construction to improve habitat for native species in and adjacent to disturbed soil areas within the project limits.

NC-3: Minimize Project Footprint. The project footprint would be reduced to the maximum extent feasible.

NC-4: Worker Environmental Awareness Training. The pre-construction 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, construction site management, and how to identify and report regulated species within the project areas. This will include a discussion of biology, identification, and habitat for sensitive species, including western yellow-billed cuckoo, coho salmon, western pearlshell mussel, and other protected species.

Animal Species

AS -1: Minimize Nighttime Lighting. Night work during certain activities is anticipated for all build alternatives. The use of artificial lighting at nighttime would be minimized to the extent practicable by limiting nighttime construction activities in or near the river, directing light to only those locations that are actively under construction and/or satisfy safety requirements, and using deflectors to direct light away from the river channel where possible.

AS -2: Nesting Bird Protection. The following would be implemented to protect nesting birds: Standard

- Vegetation removal would occur outside the bird nesting season (February 1 1 through September 15).
- Prior to project activities during the bird breeding season (February through September), a qualified biologist would conduct a nesting bird and raptor survey, as described below.
    - The preconstruction nesting bird and raptor surveys would be conducted between February 1 1 and September 15,no more than 14 days before the initiation of project activities.

- If a lapse in project activities for 14 days or longer occurs, another pre-construction survey will be performed.
- Surveys will be completed within any suitable habitat within the project work limits, plus a 250-foot buffer for passerine nests and a quarter mile buffer for raptor nests.
- For surveys in inaccessible areas, the surveying biologist will use binoculars to scan any suitable nesting substrate for potential nests.
- If an active bird nest is identified within 250 feet of the project work limits or a raptor nest is identified within a quarter mile of the project work limits, a no-disturbance buffer shall be established around the nest to avoid disturbance of the nesting birds until a qualified biologist determines that the young have fledged and are foraging on their own. The extent of these buffers shall be determined by the biologist (coordinating with Caltrans and/or CDFW) and shall depend on the species identified, level of noise or construction disturbance, line-of-sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers (such as a slope or bridge abutment).
- In addition to the establishment of buffers, other measures (determined during agency coordination) may include monitoring of the nest during construction and restricting the type of work that can be conducted near the nest site.
- If no active nests are found during the preconstruction surveys, then no additional measures are required.
- If a western yellow-billed cuckoo or cuckoo nest is discovered in or adjacent to the project, work shall cease and the United States Fish and Wildlife Service (USFWS) and CDFW shall be contacted immediately.

AS -3: Bird Nesting Prevention. Partially constructed and unoccupied nests within the construction area would be removed and disposed of on a regular basis throughout the bird nesting season to prevent their occupation. Nest removal would be repeated weekly, or more frequently, as needed, under guidance of a qualified biologist to ensure nests are inactive prior to removal. Removed nest material would be prevented from falling into waterways to the maximum extent possible. Exclusionary devices may be used to prevent birds from nesting on the existing bridge under the guidance of a qualified biologist and where application does not have the potential to entrap or harm night roosting bats.

Invasive Species

IS-1: Reseed Disturbed Areas with Native Species. To prevent the spread of invasive plant species in disturbed soil after construction, all disturbed areas would be seeded with native herbaceous species and weed-free mulch would be applied.

IS-2: Wash Invasive Species and Pathogens from Equipment. Construction equipment would be inspected and cleaned to remove invasive species and/or pathogens before being brought to the project site and prior to removal from the project area.

IS-3: Equipment Decontamination. Equipment used in the river (i.e., sheetpiles for cofferdams, drill rigs, etc.) would be decontaminated per CDFW protocol for removal of New Zealand mudsnails (NZMS) before and after being removed from the river.

IS-4: Avoid Spreading Sudden Oak Death (SOD) Pathogen. To minimize the opportunity of spreading the SOD pathogen, all California bay and tan oak trees that would be cut down, and any trimmed branches, would be chipped and left onsite.

1.7.2 Unique Features of the Build Alternatives

This section provides a description of the design features, measures, and best management practices that are unique to Alternatives 1 through 3. A comparison of the distinguishing elements of each build alternative is provided in Table 1-2. General layouts for each alternative can be found in Appendix B. Depending on the alternative, soffits (underside of the bridge) would be uniform, parabolic, or a combination thereof. Refer to Figure 1-4 below for examples of uniform and parabolic soffits. Use of a parabolic soffit allows for longer bridge spans and therefore fewer in-water piers.

Figure 1-4. Uniform Soffit (No Arch Between Piers and Constant Bridge Depth) on Left and Parabolic Soffit (Arched Between Piers With Variable Bridge Depth) on Right

Table 1-2. Comparison of Distinguishing Elements of Build Alternatives

Design Element	Alternative 1	Alternative 2	Alternative 3A	Alternative 3B
Bridge Type	CIP	PC	CIP	CIP
Bridge Alignment	West of existing	West of existing	Existing	Existing
Piers within the OHWM	1+	2+	1	1
Temporary Gravel Berms	Removed by October 15 each year, and reinstalled after June 15 in subsequent year, as needed.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Temporary Falsework	Removed by October 15 each year.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Temporary Construction Trestles	Piles would remain in the river year-round for the duration of the construction; deck and cross beams (i.e., stringers) would be removed by October 15 each year and reinstalled after June 15 in subsequent year, as needed.	Same as Alternative 1	Same as Alternative 1	Same as Alternative 1
Estimated Number of Driven Piles	142	138	194	116
Construction Duration (total years)	3.5+	3.5+	3.5+	4+
In-water Summer Seasons (number of summer seasons)	3	3	3	3
Retaining Walls and Viaducts	2 viaducts 2 soldier pile walls	2 viaducts 3 soldier pile walls	4 Type-5 walls 2 soldier pile walls	4 Type-5 walls 2 soldier pile walls
Soffits	Uniform and Parabolic	Uniform	Uniform and Parabolic	Uniform and Parabolic
Approximate Cost (Escalated)	$65,400,000	$65,358,000	$62,500,000	$62,500,000

1.7.2.1 Alternative 1. Cast-in-place Bridge on New Downstream Alignment

Bridge Type

Under Alternative 1 the new bridge type would be a CIP box girder on seismic isolation bearings with three piers (one below the OHWM of the Smith River, one partially below the OWHM, and one entirely above the OHWM). The bridge's soffit would be uniform between Abutment 1 and Pier 2 and parabolic between Pier 2 and Abutment 5. Parabolic soffits would allow for longer spans (up to 335-feet long for this bridge) while maximizing the clearance underneath. There would be triple friction pendulum type seismic isolation bearings at all locations between the bridge superstructure (bridge deck and box girder) and the substructure (abutments and piers) as indicated on Figures 1-5 and 1-6. Seismic isolation bearings would allow the bridge to move during a seismic event. With varying geotechnical conditions, seismic isolation bearings are a pragmatic solution to minimize the foundation footprints and their associated impacts.

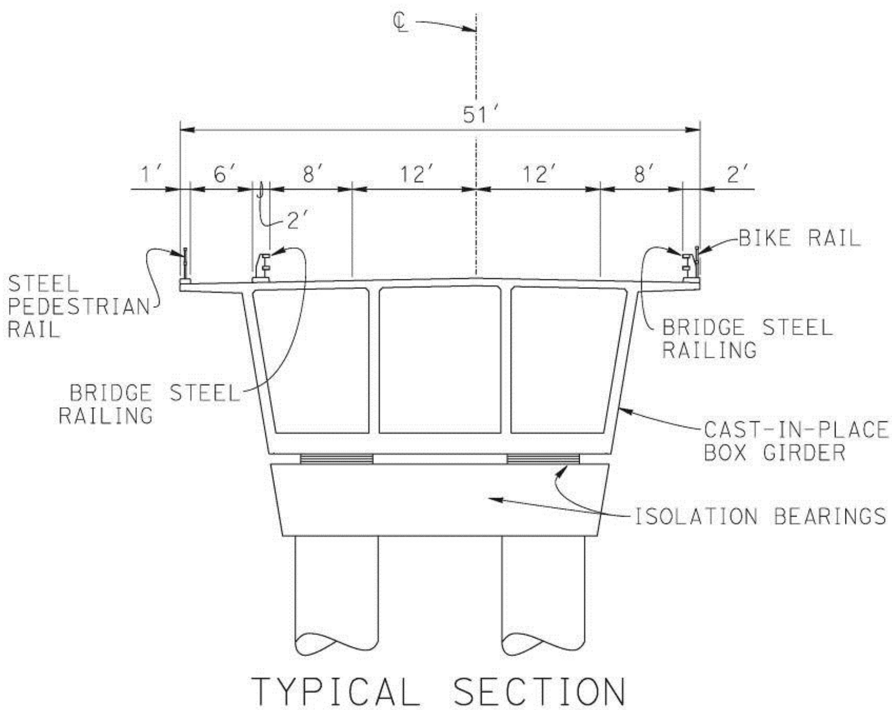


Figure 1-5. Section of Proposed Cast-In-Place Bridge Looking North, Pedestrian Walkway on Left

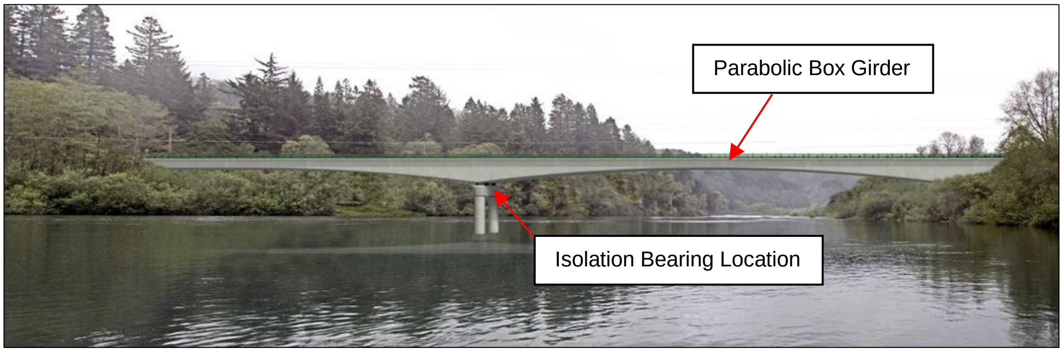


Figure 1-6. Photo-simulation of CIP Bridge, looking east.

Retaining Walls and Viaducts

Two viaducts, extending from the two corners of the bridge on the western side, would be constructed to minimize project area impacts. A viaduct is a bridge-like structure over land, not water. The proposed viaducts would consist of a series of arched spans supported on towers. Without the viaducts, fill slopes extending from the new edge of roadway would impact a much larger area. Using walls minimizes the project area when compared to cut banks which would need to be extended farther back to achieve bank stability. A soldier pile wall is constructed by placing a steel beam into a drilled hole and back filling with concrete. Lagging or a concrete face is attached to the above-ground portion of the beam to create the wall. Approximate viaduct and retaining wall lengths are included in Table 1-3.

Table 1-3. Alternative 1 Viaducts and Retaining Walls

Location	Type	Length
Northwest of bridge	Viaduct	Approximately 475 feet
Southwest of bridge	Viaduct	Approximately 250 feet
U.S. 101 Overflow Bridge, Lake Earl Drive	Soldier Pile	Approximately 686 feet
U.S. 101/Lake Earl Drive, Northwest corner	Soldier Pile	Approximately 156 feet
U.S. 101, North of Northwest viaduct	Soldier Pile	Approximately 210 feet

Right-of-Way

The permanent ROW required for the cast-in-place bridge on a new alignment alternative would total approximately 0.96 acre, comprised of 0.11 acre from the Westbrook property, 0.44 acre from the Steinruck property, 0.02 from the Calvary Chapel of the Redwoods property, and 0.39 acre from Del Norte County. A public agency lease would be required from the State Lands Commission on the downstream side of the current bridge.

Additionally, temporary construction easements would be required for material and equipment staging, access road, bridge and roadway work, and to conform the project to adjacent parcels.

In-Water Activities Unique to Cast-in-place on New Alignment

Falsework will be built to construct the new bridge and to remove the existing bridge. Falsework would be supported on the gravel berms by spread footings and on piles spanning the western pearlshell mussel bed and thalweg. For the falsework and construction trestle spanning the western pearlshell mussel bed, it is estimated that up to thirty30-inch diameter steel shell piles would be required, eighteen downstream for the new bridge construction (twelve for falsework and six for construction trestle) and twelve upstream for the bridge demolition (six for falsework and six for construction trestle). Falsework, as well as the piles and gravel berms supporting the falsework, would be in place until the bridge is cured, which is anticipated to occur prior to October 15 of the same season the falsework is installed. The falsework and supporting piles and berms would be installed at the beginning of the construction season and removed at the end of each construction season.

Construction Scenario

It is anticipated that Alternative 1 would be completed in approximately three years; however, if there are unexpected delays during construction, additional time may be required. Foundations would be the first activity in constructing the new bridge. Using a crane from the temporary gravel berm, cofferdams would be used to dewater foundation locations as needed. Once the foundation is complete, pier construction would follow. Lastly, falsework would be erected to allow construction of the bridge's superstructure from cast-in-place girders. Falsework would be installed on top of the gravel berm and on piles spanning the mussel bed.

The existing bridge would be used to carry traffic while the new bridge is constructed. Once construction of the bridge and other components (grading, fill, roadway tie-ins, and retaining walls) is completed and traffic is moved over, the existing bridge would be demolished and removed.

1.7.2.2 Alternative 2. Pre-Cast Bridge on New Downstream Alignment

Bridge Type

Under Alternative 2 the new bridge type would be a pre-cast (PC), pre-tensioned concrete girder bridge supporting a concrete slab with a total of five piers (two completely below the OHWM of the Smith River, one partially below the OHWM, and two completely above the

OHWM) (Figure 1-7). The southern half of the bridge over the south bank would have spans of 150 feet, and the northern half of the bridge over the channel would have three 190-foot spans (Figure 1-8). Both the 150- and 190-foot spans would use shorter girders spliced together during girder erection to create the final span length.

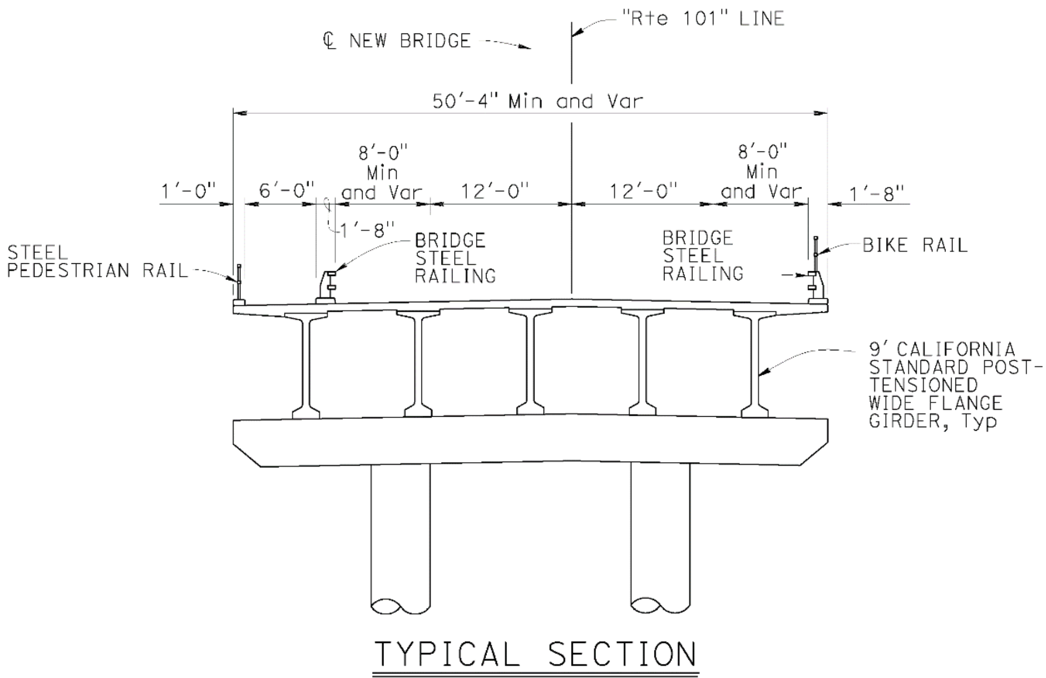


Figure 1-7. Section of Proposed Pre-Cast Bridge Looking North, Pedestrian Walkway on Left

Figure 1-8. Photo-simulation of Pre-cast Bridge, looking east.

Retaining Walls and Viaducts

Two viaducts, extending from the two corners of the bridge on the western side, and three retaining walls would be constructed to minimize project area impacts. Without the viaducts and retaining walls, fill slopes extending from the new edge of roadway would affect a much larger area. Approximate viaduct and retaining wall lengths are included in Table 1-4 below.

Table 1-4. Alternative 2 Viaducts and Retaining Walls

Location	Type	Length
Northwest of bridge	Viaduct	Approximately 475 feet
Southwest of bridge	Viaduct	Approximately 250 feet
U.S. 101/ Overflow Bridge, Lake Earl Drive	Soldier Pile	Approximately 686 feet
U.S. 101/Lake Earl Drive, Northwest corner	Soldier Pile	Approximately 156 feet
U.S. 101, North of Northwest viaduct	Soldier Pile	Approximately 210 feet

Right-of-Way

The permanent ROW required for Alternative 2 would be the same as that for Alternative 1, consisting of approximately 0.96 acre; 0.11 acre from the Westbrook property, 0.44 acre from the Steinruck property, 0.02 from the Calvary Chapel of the Redwoods property, and 0.39 acre from the Del Norte County. A public agency lease would be required from the State Lands Commission on the downstream side of the current bridge. Temporary construction easements would be required for material and equipment staging, access road, bridge and roadway work, and to conform the project to adjacent parcels.

Construction Scenario

It is anticipated that Alternative 2 would be completed in approximately three to four years; however, if there are unexpected delays during construction, additional time may be required. Foundations would be the first activity in constructing the new bridge. Using a crane from the temporary gravel berm, cofferdams would be used to dewater foundation locations as needed. Once the three foundations are complete, pier construction would follow. Lastly, splicing towers would be erected to allow construction of the bridge's superstructure from pre-cast girders. Splicing towers would be installed on top of the gravel berm or on piles spanning the mussel bed.

The existing bridge would be used to carry traffic while the new bridge is constructed. Once construction of the bridge and other components (grading, fill, roadway tie-ins, and retaining walls) is completed and traffic is moved over, the existing bridge would be demolished and removed.

In-Water Activities Unique to Pre-Cast Bridge on new alignment

Splicing towers would allow the girders to be spliced and would be placed on the gravel berms using spread footings or on piles spanning the mussel bed. These towers would remain in place until girders are spliced, erected, and post-tensioned, at which time they will be removed. Removal is anticipated to occur prior to October 15 of the same season.

1.7.2.3 Alternative 3. Cast-In-Place Bridge on Existing Alignment

Bridge Type

The new bridge type would be a CIP Box Girder on seismic isolation bearings with three piers (one below the OHWM of the Smith River, one partially below the OWHM, and one entirely above the OHWM). The bridge's soffit would be uniform between Abutment 1 and Pier 2 and parabolic between Pier 2 and Abutment 5. Parabolic soffits would allow for longer spans (up to 335-feet long for this bridge) while maximizing the clearance underneath. There would be triple friction pendulum-type seismic isolation bearings at all locations between the bridge superstructure (bridge deck and box girder) and the substructure (abutments and piers). See Figure 1-6 under Alternative 1 for a photo-simulation of a CIP bridge and Figure 1-9 below for a typical cross-section.

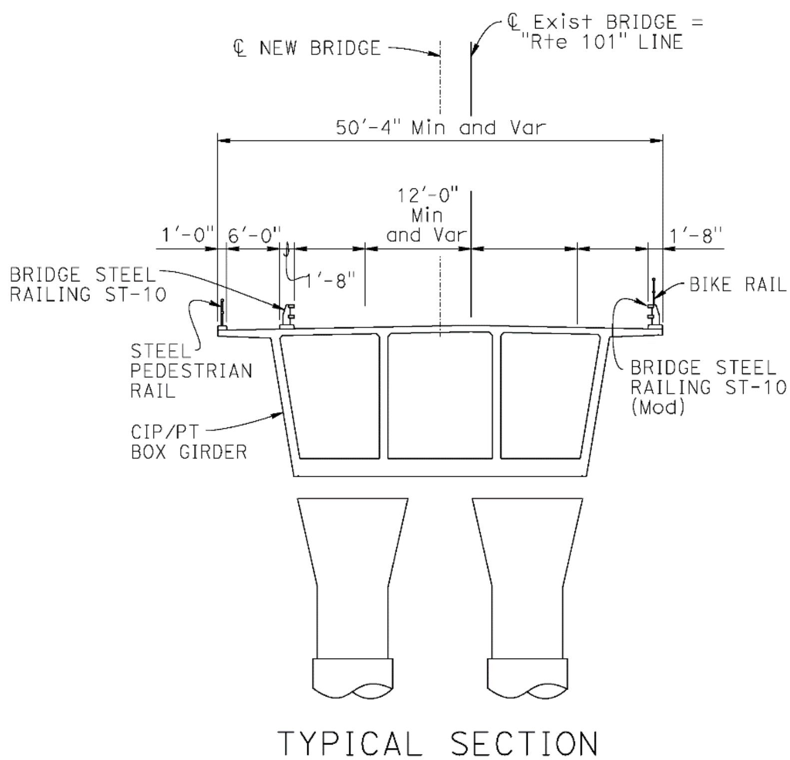


Figure 1-9. Cross Section of Proposed Cast-In-Place Bridge Looking North, Pedestrian Walkway on Left

Retaining Walls

Approximate retaining wall lengths are included in Table 1-5 below. Type 5 retaining walls would be highest closest to the river due to the topography and would decrease in height farther away from the river. A type 5 retaining wall is a standard Caltrans wall design. The spread footing section does not extend beyond the exterior vertical face of the wall. The walls would have a visual aesthetic treatment, such as colored concrete or texture, so they would blend with the natural environment. Additionally, two soldier pile walls would be constructed at the intersection of U.S. 101 with SR 197. The walls on each side of the U.S. 101/SR 197 intersection are needed as the intersection would be widened to provide adequate sight distance, turning radius area, and approach width to the new bridge. The retaining walls at the U.S. 101/SR 197 intersection are proposed to have a finish treatment with a tribal design element.

Figure 1-10. Photosimulation of the Proposed Finish Treatment ("Sturgeon Back" Design) for the Retaning Walls at the Intersection of SR 197 and U.S. 101, Facing South Towards Bridge

Table 1-5. Alternative 3 Retaining Walls

Location	Type	Length
Northwest of bridge	Type 5	Approximately 420 feet
Northeast of bridge	Type 5	Approximately 269 feet
Southwest of bridge	Type 5	Approximately 291 feet
Southeast of bridge	Type 5	Approximately 333 feet
U.S. 101/SR 197 intersection, south side	Soldier Pile	Approximately 160 feet
U.S. 101/SR 197 intersection, north side	Soldier Pile	Approximately 85 feet

Right-of-Way

The only permanent ROW required for Alternative 3 would be a small amount of property from Del Norte County at the intersection of U.S. 101 and Lake Earl Drive. It is anticipated no other permanent ROW would be required. Temporary construction easements would be required for material and equipment staging, access road, bridge and roadway work, and to conform the project to adjacent parcels.

Construction Scenario Options

It is anticipated that Alternative 3 will be completed in three or four years; however, complications during construction may lead to delays and require additional time. Two construction options for Alternative 3 are under consideration: Jack and Slide Detour (Alternative 3A) and Panel Bridge Detour (Alternative 3B). The construction scenarios for Alternative 3A and 3B, and a description of the main differences between these two options, are provided below. Because these construction options are very similar and would have similar impacts in most resource areas, descriptions of potential Alternative 3 impacts in Chapters 2 and 3 of this document apply to both Alternative 3A and 3B, unless otherwise specified.

1.7.2.4 Jack and Slide Detour Construction Option (Alternative 3A)

The main spans of the existing bridge would be relocated to the east and would be used as part of the temporary detour while the new bridge is built along the existing alignment. The temporary detour structure would be accomplished by “hydraulically jacking and sliding” (moving) the steel girder section of the current bridge (760 feet in length) onto new temporary foundations located approximately 48 feet east of the existing bridge’s alignment.

The first step would be the construction of foundations and piers for supporting the main spans of the existing bridge along the detour alignment using access from the temporary gravel berm. The roadway tie-ins (pavement and grading) north and south of the detour foundations may be constructed simultaneously while the structure work is accomplished.

Once the foundations and roadway tie-ins are completed for the temporary detour, the entire steel I-girder main spans from the existing bridge would be moved to the detour alignment using a Jack and Slide method. U.S. 101 at Dr. Fine Bridge would be closed for up to one week to allow the detour structure to be relocated and the tie-ins completed. All traffic would be rerouted to SR 197 and U.S. Route 199 (U.S. 199) during this time. The detour time delay may be up to one hour.

A substructure system would be constructed to support the Jack and Slide bridge moving apparatus. This would consist of beams supported by the existing piers, and newly constructed detour piers oriented in the direction the bridge would move. Steel piles would be driven into the temporary gravel berm at the existing piers for support once the existing piers are cut. Piles would also be used to support the mid span of the translation beams.

Once traffic is diverted to the temporary detour, construction on the new bridge would begin. Foundations would be the first activity in constructing the new bridge. Using a crane from the temporary gravel berm, a cofferdam would be used for Pier 3 and potentially Piers 2 and 4. Once the three foundations are complete, pier construction would follow. Lastly, falsework would be erected to allow construction of the bridge’s superstructure.

The detour alignment would be utilized while the new bridge is constructed. Once construction of the bridge and other components (grading, fill, and retaining walls) are completed and traffic is moved over, the detour would be demolished and removed.

1.7.2.5 Panel Bridge Detour Construction Option (Alternative 3B)

A temporary detour structure would be constructed approximately 48 feet to the east side of the existing structure (same alignment as Jack and Slide Detour option). Construction of the detour bridge would begin on land during the first winter and summer seasons and includes construction of the south approach, and piers above ordinary high water. Construction of the north approach would begin during the second winter season and includes the retaining walls that support the 3-foot increase in roadway grade. The main spans of the steel panel bridge would be constructed and launched from the south approach over the river to the north approach during the second summer season (first in-channel work window).

When traffic is switched to the detour bridge, the main spans of the existing bridge will be removed from the channel and the two shafts at the new Pier 4 support location in the Smith River would be constructed. The detour alignment would be utilized while the new bridge on the existing alignment is constructed.

During the second in-channel work season, the portion of the new CIP bridge within the wetted channel will be constructed using falsework erected on the temporary gravel berm and on piles spanning the mussel bed to allow construction of the bridge’s superstructure. Once construction of the new bridge and other components (grading, fill, and retaining walls) are completed and traffic is moved over, the steel panel detour bridge will be disassembled and transported away, and the north and south approaches would be removed.

1.7.2.6 Differences between Alternative 3Aand Alternative 3B Construction Options

The Jack and Slide detour bridge for Alternative 3A would require three temporary foundations in the wetted channel and three on the north bank of the Smith River, whereas the panel detour bridge for Alternative 3B would require two temporary foundations in channel and one on the north bank. Additionally, due to the lighter weight of the panel bridge, Alternative 3B would require smaller and fewer temporary foundations overall for the detour bridge. The temporary panel detour bridge under Alternative 3B eliminates the risk associated with moving the existing structure under Alternative 3A, which include:

- Complications with sliding apparatus could delay opening of detour (low risk)
- Structure damage to the existing bridge requiring repairs to be made prior to going into service (low risk)
- Misalignment requiring re-alignment, delaying the opening of the detour (low-risk)
- Significant damage to the bridge which cannot feasibly be repaired which would leave the route closed until a new detour structure is completed (very-low risk)

The Alternative 3B panel bridge would take less time to install and would eliminate the need to close the road and direct traffic to Route 197. While the temporary panel bridge detour may require an additional summer season, it does not require an additional season of in-water work.

In-Water Activities Unique to Alternative 3

Under both Alternative 3A and 3B, falsework would be supported on the gravel berms by spread footings and on piles spanning the western pearlshell mussel bed and thalweg. For the falsework spanning the western pearlshell mussel bed, it is estimated that up to eighteen 30-inch diameter steel shell piles would be required for bridge demolition and new construction. Falsework, as well as the piles and gravel berms supporting the falsework, would be in place until the bridge is cured, anticipated to occur prior to October 15 of the same season the falsework is installed. The falsework would be installed at the beginning of the construction season and removed at the end of each construction season.

1.7.3 No-Build (No-Action) Alternative

The No-Build (No-Action) Alternative would not replace the existing bridge. The current bridge would remain in place, remaining in a condition of fracture critical, seismically deficient, and functionally obsolete. Improvements for non-motorized users would not occur. This alternative would not satisfy the stated purpose and need of the project.

1.8 Comparison of Alternatives

Table 1-2 summarizes the alternatives and compares the design features of each build alternative. Table S-1 provides information for comparison of the three build alternatives and the No-Build Alternative, including environmental effects.

After the public circulation period, all comments will be considered, and Caltrans will select a preferred alternative and make the final determination of the project's effect on the environment. Under CEQA, Caltrans will certify that the project complies with CEQA, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. Caltrans will then file a Notice of Determination with the State Clearinghouse that will identify whether the project will have significant impacts, if mitigation measures were included as conditions of project approval, that findings were made, and that a Statement of Overriding Considerations was adopted. Similarly, if Caltrans, as assigned by the FHWA, determines the NEPA action does not significantly impact the environment, Caltrans will issue a Finding of No Significant Impact (FONSI). If it is determined that the project is likely to have a significant effect on the environment, an Environmental Impact Statement (EIS) will be prepared.

1.9 Alternatives Considered but Eliminated from Further Discussion

The "alternatives considered but eliminated from further discussion" are described below. Layouts of all the alternatives considered but eliminated from further discussion can be found in Appendix C. A summary all alternatives considered is provided in Table 1-6 below.

Table 1-6. Summary of Alternatives Considered

Current Alternative Number	2017 DED Alternative Number	Alternative Name	Alternative Description	Bridge Type	Number of Piers and Abutments
1	2	New Alignment West – CIP	Proposed Bridge on New Alignment; West of the Existing Structure	CIP Box Girder	5
2	3	New Alignment West – Pre-Cast	Proposed Bridge on New Alignment; West of the Existing Structure	Pre-Cast Girder	7
3A	4 (2017 Preferred Project)	Existing Alignment – Jack and Slide Detour East	Proposed Bridge on Existing Alignment; Detour East of the Existing Structure	CIP Box Girder	5
3B	N/A	Existing Alignment – Panel Bridge Detour East	Proposed Bridge on Existing Alignment; Detour East of the Existing Structure	CIP Box Girder	5
4	1	Build West and Slide – CIP	Proposed Bridge on Existing Alignment; New Bridge Built West of the Existing Structure and slid into place	CIP Box Girder	5
5	5	Bridge Retrofit	Existing Structure to Be Retrofitted on Existing Alignment	Two Structure Types: (CIP Reinforced Concrete Spans & Riveted Steel Plate Girder Spans)	21
6	6	No-Build Alternative	Existing Structure to Remain	Two Structure Types (CIP Reinforced Concrete Spans & Riveted Steel Plate Girder Spans)	21

1.9.1 Alternatives

In addition to Build Alternatives 1, 2, and 3 and the No-Build Alternative evaluated in this document and described in Section 1.7, two additional build alternatives were considered but eliminated from further discussion, consisting of Alternative 4 – Build West and Slide (CIP) and Alternative 5 – Existing Bridge Retrofit.

With the exception of the No-Build Alternative, all of the alternatives would require a temporary gravel berm and trestles erected to span the western pearlshell mussel bed during construction (trestles would be parallel to either the new bridge or existing bridge) and the temporary gravel berm configuration would change each construction season.

1.9.1.1 Alternative 4 – Build West and Slide – CIP

This alternative proposed to build a bridge (CIP Box Girder) on a new highway alignment 43 feet west of the existing bridge's centerline. The existing bridge would have served as the detour while the new bridge was being built. The new bridge would have then been "slid" upstream into the existing alignment. This alternative included 4 spans and 3 piers, with one in the active river channel (two 8-foot diameter columns per support location with 7-foot diameter CIP H-piles with rock sockets). During construction, this alternative would have required construction trestle piles (up to four seasons) for access over the western pearlshell mussels, falsework piles (up to two seasons), coffer dams, and a temporary gravel berm extending from the north bank. Construction was estimated to be four years in the Smith River.

As in Build Alternatives 1–3 discussed above, the Alternative 4 new bridge would have been 51 feet wide, which accommodates two 12-foot lanes, two 8-foot shoulders, a 6-foot-wide separated pedestrian walkway (on the west side only), two 2-foot barrier railings, one 1-foot pedestrian railing, and incorporates isolation bearings. The decorative rail on the east side would have been mounted on the barrier rail. Staging areas and bioswales for would have been similar to those shown on the layouts for the Build Alternatives 1, 2, and 3.

Compared to the other build alternatives, this alternative would have had greater impacts on wetlands, would have required permanent impacts on agricultural lands, and would have required falsework piles to be present in the Smith River over at least two winter seasons. Additionally, this alternative would have had additional costs associated with temporary foundations, retaining walls, and earthwork required for the detour alignment.

1.9.1.2 Alternative 5 – Existing Bridge Retrofit

This alternative proposed to retrofit the existing bridge to meet current bridge standards. In order to retrofit the existing bridge, extensive work would have been required. Each concrete pier would have needed to be reinforced by constructing two large piles (approximately 8 feet in diameter) on each side. Large concrete columns would have extended up from the piles and sandwich the bridge piers; the existing piers would have later been removed. Steel cross bracing would have been installed between existing I-girders. Pin and hanger assemblies would have been removed, inspected, and replaced if needed. Temporary supports would have been constructed at each end and the fatigued steel members strengthened.

The bridge deck would have been replaced and widened, which would have required a containment system. All steel components would have had lead paint removed and be repainted. The approach spans would have been retrofitted though replacement because almost all aspects of retrofitting the approach spans, rebuilding the deck, columns, and foundations would have been costlier and time consuming than replacement. Construction trestles would have still been needed on both sides of the bridge and the number of piers would have remained the same.

The retrofit alternative would not have met the purpose and need of the project because the bridge would have not met current material, geometric, scour, and seismic design standards. Improvements for non-motorized users would not occur. The bridge would have still needed to be replaced at some time in the future, which would mean the same or more impacts of the build alternatives would occur.

1.9.2 Other Bridges/Construction Methods Considered But Eliminated

1.9.2.1 Half Width Construction

Half-width construction is similar to staged construction in that it would involve demolishing half of the existing bridge. Half width construction is not feasible. The existing bridge is a two-girder steel structure. The stability of the bridge deck is dependent on both steel girders. Damage or removal of one of the steel girders would cause the bridge to collapse.

1.9.2.2 Single Span

A single span bridge would not include any permanent piers in the water. Because of the surrounding topography, construction of a single span bridge would require large towers approximately 200 feet tall on either side of the river. It would also be a very expensive bridge, approximately twice the cost of the Build Alternatives 1, 2, and 3.

1.9.2.3 U.S. 101 / SR 197 / U.S. 199 Detour

This detour would send traffic around the bridge site via U.S. 199 and SR 197. There are two points where one-way traffic control would be required due to truck turning radii: one on U.S. 199 approximately 1.5 miles west of the intersection on SR 197/U.S. 199, and one at the intersection of SR 197/U.S. 199. Traffic control locations would lead to excessive queuing that would not be able to be managed at serviceable levels. Traffic queues were estimated using modeling software and were found to extend approximately 8 miles in each direction during peak travel times and would take hours to clear (Caltrans 2016).

1.10 Permits and Approvals Needed

The permits, reviews, and approvals required for project construction are presented in Table S-2 in the *Summary*.

Chapter 2 Affected Environment; Environmental Consequences; and Avoidance, Minimization, and/or Mitigation Measures

Chapter 2 explains the impacts the build alternatives would have on the human, physical, and biological environments in the project area. Potential impacts of the build alternatives are often the same and are described for all. Where potential impacts differ, the alternatives are compared. Two construction options for Alternative 3 are under consideration: Jack and Slide Detour (Alternative 3A) and Panel Bridge Detour (Alternative 3B). Because these construction options would have similar impacts in most resource areas, descriptions of potential Alternative 3 impacts apply to both Alternative 3A and 3B, unless otherwise specified. Each impact topic is described in the following order: regulatory setting, affected environment (existing conditions), environmental consequences (potential impacts from each of the alternatives), and avoidance, minimization, and/or mitigation measures (AMMs). The AMMs described below apply to all build alternatives unless stated otherwise.

As part of the scoping and environmental analysis completed for the project, the following environmental issues were considered, but no adverse impacts were identified. As a result, there is no further discussion about these issues in the document

- Growth—This project would replace the existing two-lane bridge with a new two-lane bridge. This project would not induce growth because it would not 1) increase the capacity of the highway, 2) construct a new interchange, or 3) create access points to previously inaccessible areas.
- Community Impacts—The project would not affect any community attributes or eliminate any jobs. The project would not require any relocations. Under Alternatives 1 and 2, the project would require a minor amount of permanent fee title acquisition. The proposed property acquisition consists of small slivers adjacent to the highway across multiple parcels. Acquisition would not impact any existing structures.
- Environmental Justice—No minority or low-income populations that would be adversely affected by the proposed project have been identified as determined above. Therefore, this project is not subject to the provisions of Executive Order 12898.

2.1 Human Environment

2.1.1 Land Use

2.1.1.1 Existing and Future Land Use

Regulatory Setting

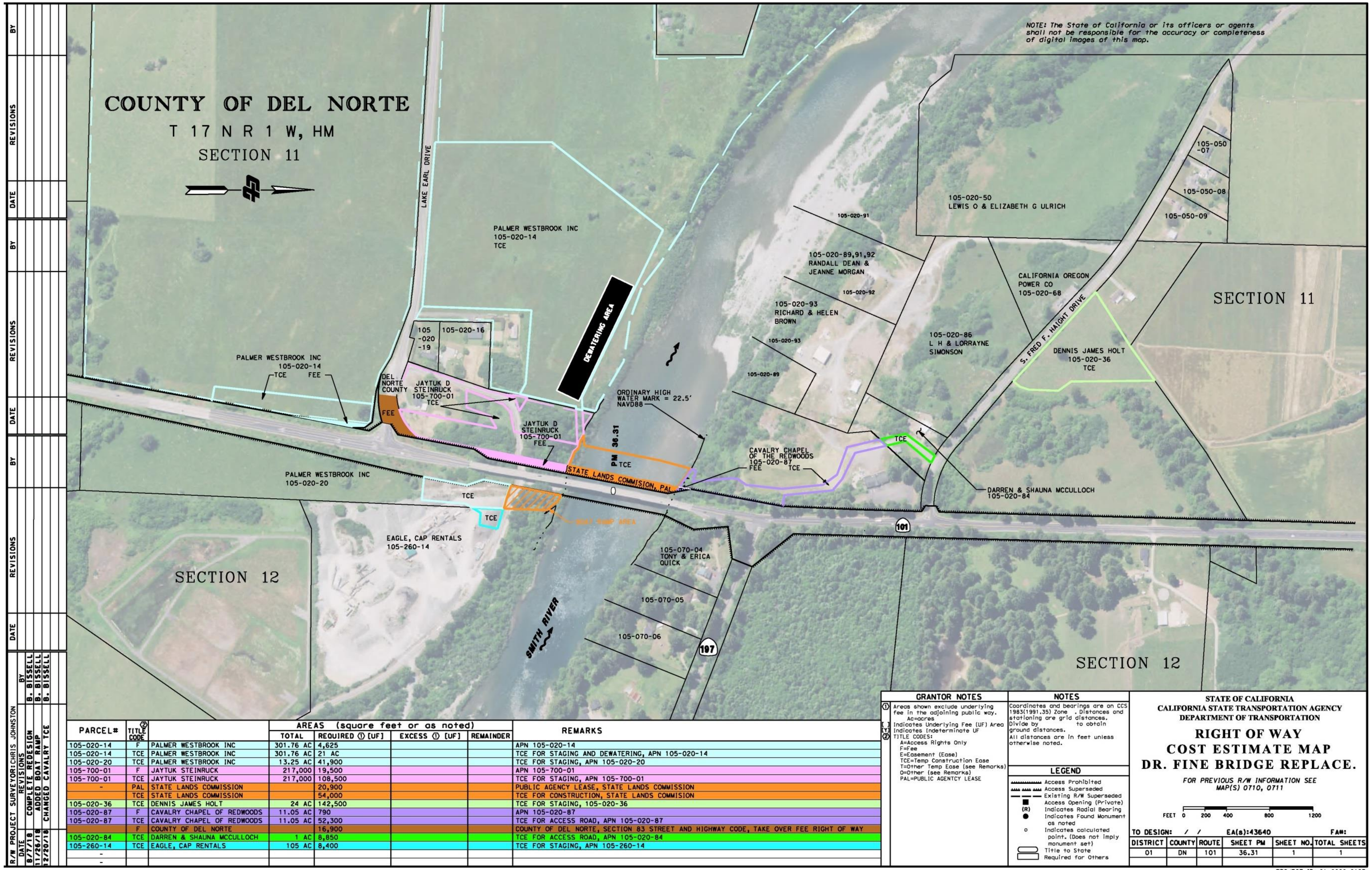
The Del Norte County General Plan (Del Norte County 2003) establishes the land use and community development policies in the project area by prescribing the uses for all of the unincorporated areas of the county; describing standards for each of the land use designations shown on the county Land Use Diagram; and providing goals, policies, and programs designed to guide day-to-day decisions concerning land use, development, and environmental protection in Del Norte County.

Affected Environment

The area surrounding the project is sparsely developed and is primarily agricultural. There are pockets of residential development, including several residences along SR 197 on the northeast side of the bridge and a few just southwest of the bridge, the nearest of which is located about 170 feet from the highway. Approximately 5 miles south of the Oregon Border and 3 miles north of the Dr. Fine Bridge is the small unincorporated community of Smith River. Another small unincorporated community known as Fort Dick is located west of U.S. 101 approximately 1 mile south of the bridge. The community is approximately 10 miles north of Crescent City and 15 miles south of the California-Oregon state line. The area around Crescent City is more urban in character. The existing land use designations surrounding the project limits include General Agriculture, Prime Agriculture, Rural Residential, Timberland, and Visitor Serving Commercial (Del Norte 2003). The region supports a mixture of rural residences, mineral/gravel extraction, timber production, agriculture, and recreation.

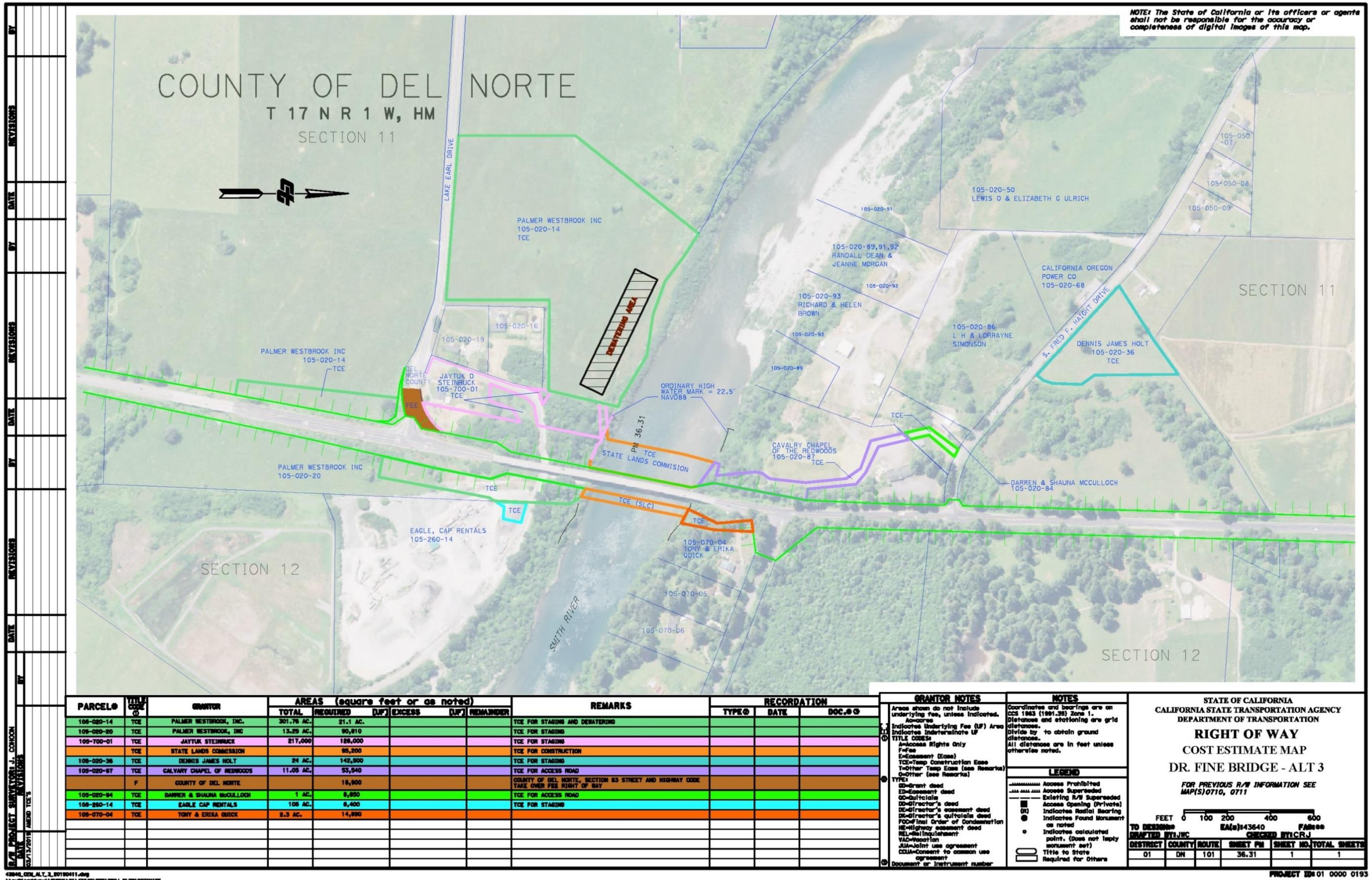
Environmental Consequences

Parcels with ROW acquisition and temporary construction easements for each build alternative are shown on Figures 2-1 and 2-2 and in Table 2-1. Under Alternatives 1 and 2, the new bridge would include work outside of the state and county ROW, requiring a minor amount of permanent ROW acquisition from adjacent private properties. Under Alternative 3, the new bridge would be almost entirely within the current state highway ROW, except for a small roadside area southwest of the bridge that is currently owned by Del Norte County, which Caltrans will acquire as fee title. Under all build alternatives, bioswales and/or biostrips for the project would be in state and county ROW.



PARCEL#	TITLE CODE ②		AREAS (square feet or as noted) TOTAL	REQUIRED ① [UF]	EXCESS ① [UF]	REMAINDER	REMARKS
105-020-14	F	PALMER WESTBROOK INC	301.76 AC	4,625			APN 105-020-14
105-020-14	TCE	PALMER WESTBROOK INC	301.76 AC	21 AC			TCE FOR STAGING AND DEWATERING, APN 105-020-14
105-020-20	TCE	PALMER WESTBROOK INC	13.25 AC	41,900			TCE FOR STAGING, APN 105-020-20
105-700-01	F	JAYTUK STEINRUCK	217,000	19,500			APN 105-700-01
105-700-01	TCE	JAYTUK STEINRUCK	217,000	108,500			TCE FOR STAGING, APN 105-700-01
-	PAL	STATE LANDS COMMISSION		20,900			PUBLIC AGENCY LEASE, STATE LANDS COMMISSION
	TCE	STATE LANDS COMMISSION		54,000			TCE FOR CONSTRUCTION, STATE LANDS COMMISION
105-020-36	TCE	DENNIS JAMES HOLT	24 AC	142,500			TCE FOR STAGING, 105-020-36
105-020-87	F	CAVALRY CHAPEL OF REDWOODS	11.05 AC	790			APN 105-020-87
105-020-87	TCE	CAVALRY CHAPEL OF REDWOODS	11.05 AC	52,300			TCE FOR ACCESS ROAD, APN 105-020-87
	F	COUNTY OF DEL NORTE		16,900			COUNTY OF DEL NORTE, SECTION 83 STREET AND HIGHWAY CODE, TAKE OVER FEE RIGHT OF WAY
105-020-84	TCE	DARREN & SHAUNA MCCULLOCH	1 AC	8,850			TCE FOR ACCESS ROAD, APN 105-020-84
105-260-14	TCE	EAGLE, CAP RENTALS	105 AC	8,400			TCE FOR STAGING, APN 105-260-14
-							
-							

Figure 2-1. Right-of-Way Requirements for Alternative 1 and 2



PARCEL#	TITLE CODE	GRANTOR	AREAS (square feet or as noted) TOTAL	REQUIRED	EXCESS	REMAINDER	REMARKS	RECORDATION TYPE	DATE	DOC.#
105-020-14	TCE	PALMER WESTBROOK, INC.	301.76 AC.	21.1 AC.			TCE FOR STAGING AND DEWATERING			
105-020-20	TCE	PALMER WESTBROOK, INC	13.29 AC.	90,810			TCE FOR STAGING			
105-700-01	TCE	JAYTUK STEINRUCK	217,000	128,000			TCE FOR STAGING			
	TCE	STATE LANDS COMMISSION		95,200			TCE FOR CONSTRUCTION			
105-020-36	TCE	DENNIS JAMES HOLT	24 AC.	142,500			TCE FOR STAGING			
105-020-87	TCE	CALVARY CHAPEL OF REDWOODS	11.05 AC.	53,540			TCE FOR ACCESS ROAD			
	F	COUNTY OF DEL NORTE		18,900			COUNTY OF DEL NORTE, SECTION 83 STREET AND HIGHWAY CODE TAKE OVER FEE RIGHT OF WAY			
105-020-84	TCE	DARREN & SHAUNA McCULLOCH	1 AC.	8,850			TCE FOR ACCESS ROAD			
105-260-14	TCE	EAGLE CAP RENTALS	105 AC.	8,400			TCE FOR STAGING			
105-070-04	TCE	TONY & ERIKA QUICK	2.3 AC.	14,890						

Figure 2-2. Right-of-Way Requirements for Alternative 3

Under all build alternatives, temporary construction easements would be required during construction. The parcels temporarily used during construction would not have their land use or zoning designations changed. Upon completion of the project, the parcels temporarily used during construction would be restored to their pre-construction condition. The project would not result in growth or future land use or zoning changes.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

2.1.1.2 Consistency with State, Regional, and Local Plans and Programs

The project is consistent with state, regional, and local plans, including the Del Norte County 2016 Regional Transportation Plan, Del Norte Local Transportation Commission, the Del Norte County 2003 General Plan, and the Del Norte County 1983 Local Coastal Plan. The proposed project is consistent with the transportation section of the Del Norte General Plan (Del Norte 2003) under Goal 8.A. for state highways: "*To plan for the long-range planning and development of Del Norte County's State Highway system to ensure the safe and efficient movement of people and goods.*" The project is identified in the Action Element of the Del Norte Regional Transportation Plan (Del Norte Local Transportation Commission 2016) as a Transportation System Improvement. The project is consistent with the Del Norte County Bicycle Facilities Plan (Del Norte Local Transportation Commission 2010) under Policy I-2: "*Support the construction of bicycle facilities that connect work, school, shopping, recreation, and other activity centers.*"

Provided below is a detailed evaluation of the project's consistency with the Coastal Zone Management Act (CZMA), National Wild and Scenic Rivers Act (16 U.S. Code [USC] 1271), and California Wild and Scenic Rivers Act (PRC 5093.50 et seq.).

Table 2-1. Right-of-Way Acquisition and Temporary Construction Easements for Build Alternatives

APN	Owner	Zoning	Alternative 1 and 2: Fee* (acres)	Alternative 1 and 2: TCE* (acres)	Alternative 1 and 2: PAL* (acres)	Alternative 3: Fee* (acres)	Alternative 3: TCE* (acres)	Alternative 3: PAL* (acres)
105-020-14	Palmer Westbrook, Inc.	AE (Agriculture Exclusive) & RCA (Resource Conservation)	0.11	21.00	N/A	N/A	21.00	N/A
105-020-20	Palmer Westbrook, Inc.	A (Agricultural General)	N/A	0.96	N/A	N/A	2.08	N/A
105-700-01	Steinruck	CR (Commercial Recreational	0.44	2.49	N/A	N/A	2.94	N/A
N/A	State Lands Commission	N/A (riverbed of Smith River)	N/A	0.12	0.25	N/A	2.19	N/A
105-020-36	Holt	AE	N/A	3.27	N/A	N/A	3.27	N/A
105-020-87	Calvary Chapel of the Redwoods	CR-C(A) (CR-Coastal Area Combining) & RCA	0.02	1.20	N/A	N/A	1.23	N/A
N/A	Del Norte County	N/A	0.39	N/A	N/A	0.39	N/A	N/A
105-020-84	McCulloch	AE & CR- C(A)	N/A	0.20	N/A	N/A	0.20	N/A
105-260-14	Eagle, Cap Rentals	A	N/A	0.19	N/A	N/A	0.19	N/A
105-070-004	Quick	RR (Rural Residential)	N/A	N/A	N/A	N/A	0.34	N/A
Total	N/A	N/A	0.96	29.44	0.25	0.39	33.44	0.00

* Fee = Permanent Fee Title Acquisition; TCE = Temporary Construction Easement; PAL = Public Agency Lease

2.1.1.3 Coastal Zone

Regulatory Setting

This project has the potential to affect resources protected by the CZMA of 1972, which is the primary federal law enacted to preserve and protect coastal resources. The CZMA sets up a program under which coastal states are encouraged to develop coastal management programs. States with an approved coastal management plan can review federal permits and activities to determine if they are consistent with the state's management plan.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. Policies established by the California Coastal Act are similar to those for the CZMA and include the protection and expansion of public access and recreation; the protection, enhancement, and restoration of environmentally sensitive areas; protection of agricultural lands; protection of scenic beauty; and the protection of property and life from coastal hazards. The CCC is responsible for implementation and oversight under the California Coastal Act.

Just as the federal CZMA delegates power to coastal states to develop their own coastal management plans, the California Coastal Act delegates power to local governments to enact their own local coastal programs (LCPs). This project is subject to Del Norte County's LCP, which is described in the 1983 Coastal Element of the county's General Plan (Del Norte County 1983) and is implemented through Title 21, *Coastal Zoning* of the Del Norte County Code.

A Federal Consistency Certification will be needed as well. The Federal Consistency Certification process will be initiated prior to FED and will be completed to the maximum extent possible during the NEPA process.

Affected Environment

U.S. 101 traverses the entire length of Caltrans District 1, from the Sonoma and Mendocino county lines through Mendocino, Humboldt, and Del Norte counties to the Oregon border. This route is known as the Redwood Highway and is considered the "lifeline" of the North Coast. U.S. 101 through the project area is functionally classified as a rural principal arterial by the Highway Design Manual (Caltrans 2015a), part of the California Freeway and Expressway System, and is included in the National Highway System.

This section of U.S. 101 is part of the designated California Coastal Trail and Pacific Coast Bike Route, in a portion categorized as a Class III Bike Route (shared use with pedestrians or motor vehicles). A Class II Bike Lane (striped lane for one-way bike travel on a street or highway) is designated along Lake Earl Drive and South Fred D. Haight Drive (Echelon Transportation Group 2015). Due to the existing 1-foot shoulders, there is a bicyclist-activated warning system to alert drivers of their presence on the bridge when crossing.

The project limits are within the coastal jurisdiction of Del Norte County and the State of California (Figure 2-3). Section 30601.3 of the California Coastal Act authorizes the CCC to process a “consolidated” Coastal Development Permit (CDP) application when requested by the local government and the applicant, and approved by the Commission’s Executive Director, for projects that would otherwise require a CDP from both the CCC and from a local government with a certified Local Coastal Plan. A consolidated permit review streamlines the permitting process by allowing all components of the project to be reviewed and approved within one CDP. Caltrans intends to request approval from Del Norte County to consolidate their permit with the CCC’s. If approved, Caltrans would submit one CDP application to the CCC which would encompass the entire project.

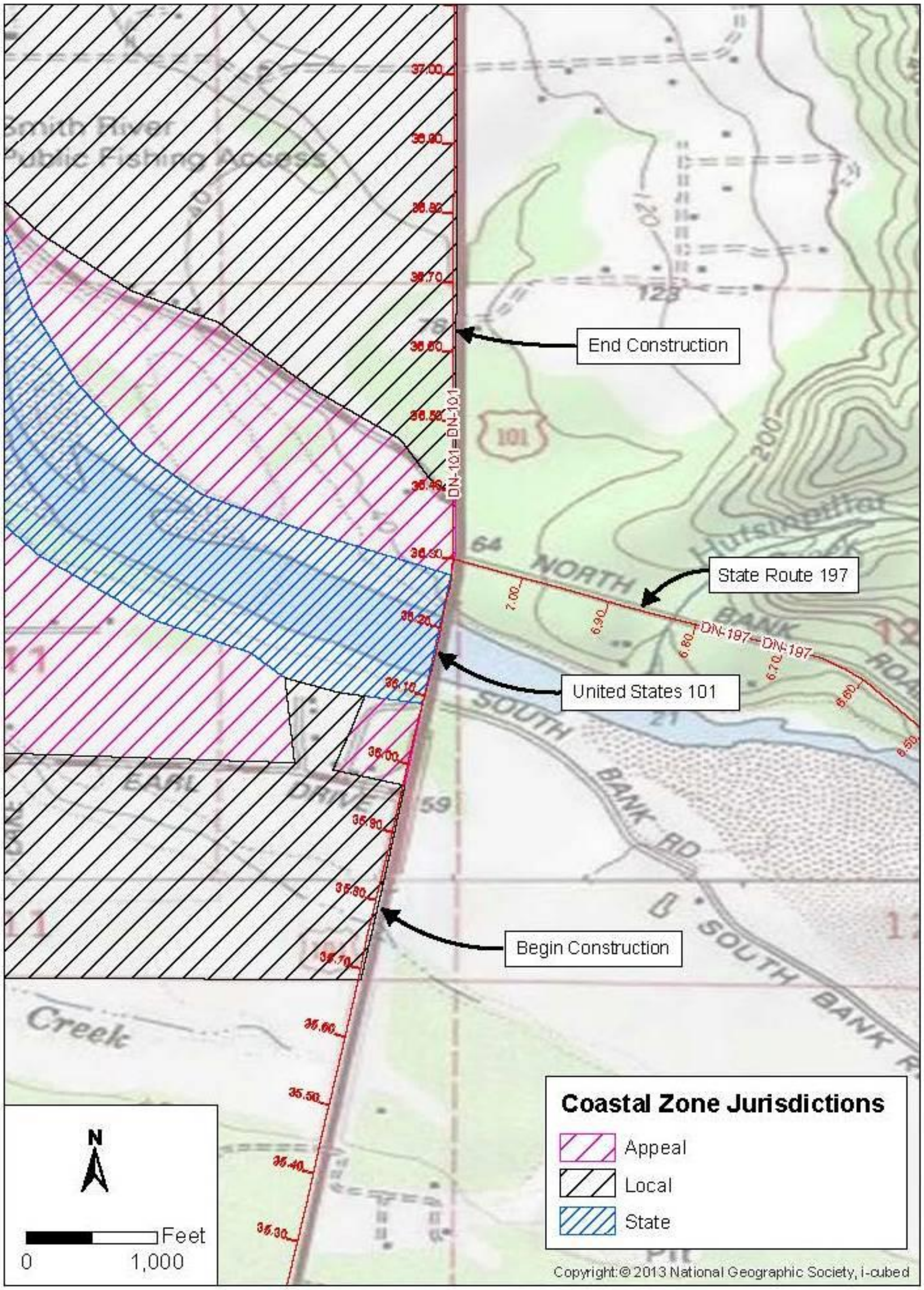


Figure 2-3. Coastal Zone Jurisdiction

Environmental Consequences

The project would directly affect regulated coastal resources. This section evaluates the project's consistency with the California Coastal Act. The Coastal Act consists of 11 chapters. With the exception of Chapter 3, the chapters mainly focus on the rules and administrative guidelines associated with the Coastal Act. Chapter 3 ("Coastal Resources Planning and Management Policies") is the main chapter used when determining if a project is consistent with the Coastal Act. Chapter 3 includes seven Articles (General, Public Access, Recreation, Marine Environment, Land Resources, Development, and Industrial Development). Each of these topics is discussed below in the *Coastal Act Chapter Three Policy Consistency Summary Table* (Table 2-2). The table below also provides a reference to the applicable section of this document that includes a full analysis of each of these seven topics.

Table 2-2. Coastal Act Chapter Three Policy Consistency Summary Table

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
Wetlands	
Coastal Act Section 30230. *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreation, scientific, and educational purposes.* **Coastal Act Section 30231**.*The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.* **Coastal Act Section 30233** (in relevant part). *(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be*	All build alternatives will have unavoidable impacts on wetlands, as described in Section 2.3.2, *Wetlands and Other Waters*. Three build alternatives have been evaluated and no other design or siting alternative is feasible that meets the purpose and objectives of the project without requiring wetland fill. The need for permanent fill triggers a three-part test under Section 30233(a): allowable use, alternatives, and mitigation. Under the first test, a project must qualify as one of the seven stated uses under Section 30233(a). Based on previously approved Coastal Development Permits for bridge replacement projects, the replacement of the Dr. Fine Bridge qualifies as an allowable use because it would be implemented by a public agency for a public service. This satisfies the criteria in Section 30233(a) (4), "*Incidental public service purposes…"* Regarding the second test under Section 30233(a) requiring the evaluation of alternatives, this document provides a thorough evaluation of alternatives. See Table 1-2 *Summary of Alternatives Considered* and Section 1.9*, Alternatives Considered but Eliminated from Further Discussion*. For the third test, Caltrans is proposing "Project Features, Standard Measures, and Best Management Practices" as described in Section 1.7.1 and avoidance, minimization, and/or

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following: (1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities. (2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps. (3) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities. (4) Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines. (5) Mineral extraction, including sand for beaches, except in environmentally sensitive areas. (6) Restoration purposes. (7) Nature study, aquaculture, or similar resource dependent activities.... **Del Norte County LCP (1983):** Water Resources: *Though ecologically linked to the marine environment, inland coastal water resources (e.g., estuaries, wetlands, streams, etc.) will be examined separately.*	mitigation measures to ensure the project meets the Section 30233(a) requirement that “feasible mitigation measures have been provided to minimize adverse environmental effects.” See Section 2.3, *Biological Environment,* for details on the proposed avoidance, minimization, and/or mitigation measures for wetlands. In addition, based on previous CCC precedence, the project could be considered a “very minor incidental public facility” as outlined in Section 30233(c). Given the project 1) has evaluated multiple alternatives, 2) would mitigate for impacts on listed species and wetlands, 3) would result in improved water quality, and 4) would have a net benefit on marine resources by reducing structures in the river channel, the project is consistent with the Marine Environment component of the Coastal Act and Local Coastal Program (LCP).
Agricultural Resources	
Coastal Act Section 30241 *The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas’ agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following:* *(a) By establishing stable boundaries separating urban and rural areas, including, where necessary, clearly defined buffer areas to minimize conflicts between agricultural and urban land uses.* *(b) By limiting conversions of agricultural lands around the periphery of urban areas to the lands where the viability of existing agricultural use is already severely limited by conflicts with urban uses or where the conversion of the lands would complete a logical and viable neighborhood and contribute to the establishment of a stable limit to*	All build alternatives will require temporary construction easements on some agricultural parcels, as described in Section 2.1.2, *Farmlands/Timberlands*. Additionally, Alternative 1 and 2 would require the permanent acquisition of approximately 0.11 acre of agricultural land. This area consists of a small, linear, roadside strip of land near the intersection of U.S. 101 and Lake Earl Drive. The 0.11 acre area that would be converted from agricultural use under Alternative 1 and 2 is a negligible portion (0.04 %) of a large 301.76-acre agricultural parcel. The retaining wall on the southwest side of the project area was incorporated into the design of Alternatives 1 and 2 to minimize the area of permanent impacts on actively farmed agricultural areas. Under all build alternatives, all temporarily

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
urban development. *(c) By permitting the conversion of agricultural land surrounded by urban uses where the conversion of the land would be consistent with Section 30250.* *(d) By developing available lands not suited for agriculture prior to the conversion of agricultural lands.* *(e) By assuring that public service and facility expansions and nonagricultural development do not impair agricultural viability, either through increased assessment costs or degraded air and water quality.* *(f) By assuring that all divisions of prime agricultural lands, except those conversions approved pursuant to subdivision (b), and all development adjacent to prime agricultural lands shall not diminish the productivity of such prime agricultural lands.* **Coastal Act Section 30242 :** *All other lands suitable for agricultural use shall not be converted to nonagricultural uses unless (l) continued or renewed agricultural use is not feasible, or (2) such conversion would preserve prime agricultural land or concentrate development consistent with Section 30250. Any such permitted conversion shall be compatible with continued agricultural use on surrounding lands.* **Coastal Act Section 30113 :** "*Prime agricultural land*" *means those lands defined in paragraph (1), (2), (3), or (4) of subdivision (c) of Section 51201 of the Government Code.* Section 51201(c) of the California Government Code includes: (*1) a rating as class I or class II in the Natural Resource Conservation Service Land use capability classifications; (2) a rating 80 through 100 in the Storie Index Rating; or (3) the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture; or (4) the ability to normally yield in a commercial bearing period on an annual basis not less than two hundred dollars ($200) per acre of unprocessed agricultural plant production of fruit- or nut-bearing trees, vines, bushes or crops which have a nonbearing period of less than five years.* **Coastal Act Section 30243:** *The long-term productivity of soils and timberlands shall be protected, and conversions of coastal commercial timberlands in units of commercial*	occupied agricultural lands would be restored to pre-construction conditions and soils that have been compacted would be loosened upon completion of the project to be able to support agricultural uses. Alternative 1 and 2 would have a negligible impact on the conversion of agricultural land. Alternative 3 would have no impact on the conversion of agricultural land. Therefore, all build alternatives are considered to meet the Coastal Act and LCP criteria for conversion of agricultural land to non-agricultural uses.

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
size to other uses or their division into units of noncommercial size shall be limited to providing for necessary timber processing and related facilities. **Del Norte County LCP (1983):** *Del Norte County fully acknowledges the need to conserve is valuable agricultural resources. The following policies are established in order to maintain agricultural productivity in the Coastal Zone: (1) If a parcel is designated for prime agricultural use, conversion to a non-agricultural use shall not be permitted except where allowed in Section 30241 of the Coastal Act. (2) An Agricultural land use designation shall be given to parcels that meet both of the following: (a) A minimum of 5 acres of contiguous ownership (b) Lands in agricultural use not designated prime agricultural land as above.*	
Public Access	
Coastal Act Section 30210. *In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.* **Coastal Act Section 30211**. *Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.* **Coastal Act Section 30212**. *(a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway. …* **Coastal Act Section 30213**. *Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. …* **Coastal Act Section 30214**. *(a) The public*	The proposed project would improve coastal access by increasing safety, connectivity, and reliability of the bridge for hikers, bikers, travelers, commuters, and freight carriers. Impacts on public access are discussed in Section 2.1.1.5, *Parks and Recreation Facilities,* below and in Section 2.1.4, *Traffic and Transportation/Pedestrian and Bicycle Facilities*. As described in Section 1.7.1 *Common Design Features of All Alternatives,* there is currently informal public access to the Smith River under the existing bridge on the southern bank. This area is on state-owned property and is not actively managed for public access; nor is the property designated a park, wildlife refuge, recreational area, or an official river access point. Under all build alternatives, public access during construction would be prohibited. After construction, vehicle access in this area would be prohibited by installation of boulders along South Bank Road. Pedestrian access would still be available. Prohibiting vehicle access would benefit biological resources, reduce direct ground disturbance and erosion at the edge of the channel in this area, allow growth of riparian vegetation in the area that is currently used as an informal dirt road, and limit the amount of garbage and refuse that is currently being left in the area. To avoid potential public access impacts resulting from the loss of informal vehicular access at this site, a sign would be posted providing information about other nearby sites that provide vehicular access

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following: (1) Topographic and geologic site characteristics. (2) The capacity of the site to sustain use and at what level of intensity. (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses. (4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter. (b) It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's constitutional right of access pursuant to Section 4 of Article X of the California Constitution. … **Coastal Act Section 30220**. *Protection of certain water-oriented activities Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.* **Coastal Act Section 30221**. *Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.* **Coastal Act Section 30223**. *Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.* **Coastal Act Section 30224**. *Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.* **Coastal Act Section 30252.** *The location and*	and boat launching opportunities to the Smith River. Additionally, Caltrans will work with CDFW to improve signage along Fred D. Haight Drive directing recreation users to the existing CDFW Smith River Public Fishing Access, located less than 1 mile downstream of the bridge. On the northwest side of the bridge, a CCC Vertical Accessway (i.e., easement) is recorded, but not yet opened within Assessor Parcel Number 105-020-87. Recorded in 1979, the type of access is an Offer to Dedicate (OTD) a legal document that offers an easement across private land for a future public accessway. Access is often required as part of Coastal Development Permits. In order to open the accessway for public use, it must be accepted for management by a responsible agency and then improved and opened. The recorded OTD runs roughly parallel to U.S. 101 from Fred D. Haight Drive, down to the north bank of the Smith River, and along the northern riverbank for approximately 0.33 mile (CCC 2016). Implementation of Alternative 1 or 2 will require acquisition of ROW from this parcel but would not require ROW within the recorded OTD easement. The project would therefore not affect the OTD for a future public accessway. The Dr. Fine Bridge is at the eastern boundary of the Coastal Zone, which ends at the state highway ROW. No direct shoreline access is possible. The project would not limit temporary or permanent access to the shoreline or marine areas. Overall, the project would have a beneficial effect on coastal access by improving safety and reliability for recreationists, would maintain recreation and access opportunities at nearby Smith River access points, and would be consistent with the public access and recreation policies of the Coastal Act and LCP.

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
amount of new development should maintain and enhance public access to the coast by (1) facilitating the provision or extension of transit service, (2) providing commercial facilities within or adjoining residential development or in other areas that will minimize the use of coastal access roads, (3) providing non-automobile circulation within the development, (4) providing adequate parking facilities or providing substitute means of serving the development with public transportation, (5) assuring the potential for public transit for high intensity uses such as high-rise office buildings, and by (6) assuring that the recreational needs of new residents will not overload nearby coastal recreation areas by correlating the amount of development with local park acquisition and development plans with the provision of onsite recreational facilities to serve the new development. **Del Norte County LCP (1983):** *Shoreline access is emphasized in the California Coastal Act to provide for all people the full benefits of coastal recreation resources. This section will state the general provisions regarding public shoreline access for the County of Del Norte: (1) the County shall work actively towards the attainment of maximum coastal access for the public, where it is consistent with public safety, property owner rights and the protection of fragile coastal resources. (2) The rights of private property owners shall be protected in all consideration of public access.*	

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
Visual Resources and Community Character	
Coastal Act Section 30251. The scenic and visual qualities of coastal *areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.* **Del Norte County LCP (1983):** <u>*Smith River Bottomlands:*</u> *This area is inventoried in the Del Norte LCP Visual Resource Inventory as an area containing view corridors and viewpoints. The LCP's policy is to ensure minimization to permanent impacts on areas included in the Del Norte Visual Resource Inventory*	The project site is well inland from the coastal shoreline; however, the highway is a major coastal access route. As described in Section 2.1.5, *Visual/Aesthetics,* a Visual Impact Assessment (VIA) was conducted and found that all build alternatives would not have a substantial effect to a scenic vista, degrade the existing visual character of the site, or create a new source of substantial light or glare that would affect day or nighttime views in the area. The project includes aesthetic treatments, incorporating a "see through" bridge rail with a design motif that reflects a tribal pattern seen in basket designs from Indians of Northwestern California. Application of earthen color on the retaining walls to blend into the surrounding environment would also be incorporated. Standard measures and design features of the structures would preserve visibility and visual quality. Areas disturbed by construction will be revegetated with native plant materials to minimize adverse impacts associated with the proposed project to the extent possible. No public views of the coastline are currently available or will be affected by the proposed development. Therefore, the project protects the scenic and visual qualities of the area and is consistent with Section 30251 of the Coastal Act and LCP.
Environmentally Sensitive Habitat Area (ESHA)	
Coastal Act Section 30240.*(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas. (b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.* **Coastal Act Section 30107.5.** "Environmentally sensitive area" means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments	Impacts on ESHAs are fully discussed in Section 2.3.1, *Natural Communities.* All alternatives would result in minor unavoidable permanent impacts on ESHAs. Alternatives 1 and 2 would have approximately 0.51 acre and Alternative 3 would have approximately 0.15 acre of permanent effect to ESHAs. Several alternatives have been evaluated and no other design or siting alternative is feasible that meets the purpose and objectives of the project without requiring ESHA impacts. Impacts have been avoided to the maximum extent feasible and measures have been incorporated into the project to minimize adverse environmental effects.

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
Del Norte County LCP (1983): *Del Norte County recognizes the economic and biologic significance of maintaining and where possible enhancing marine resources, coastal waters and sensitive coastal habitats. General policies designed towards achieving these important goals are stated in this section. (6) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas. Development in areas adjacent to environmentally sensitive habitat areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.*	
Water Quality	
Coastal Act Section 30230. *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreation, scientific, and educational purposes.* **Coastal Act Section 30231**.*The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.* **Coastal Act Section 30232.** *Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective*	See Section 2.2.2 *Water Quality and Storm Water Runoff* for a full analysis of water quality impacts. All build alternatives would result in a minor increase of impervious surfaces, which could result in the introduction of pollutants from highway runoff due to higher volumes and higher velocities of runoff during storms. Impacts have been avoided to the maximum extent feasible and measures have been incorporated into the project to protect water quality. These include measures to protect water quality during construction, such as sediment and pollution control, spill prevention measures, and construction BMPs, included as part of the SWPPP. The project also includes implementation of operational BMPs to control pollutant sources, keep pollutants segregated from stormwater and minimize tainted runoff. Through implementation of these measures, all build alternatives would be consistent with the water quality protection policies of the Coastal Act and LCP.

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
containment and cleanup facilities and procedures shall be provided for accidental spills that do occur. **Del Norte County LCP (1983):** *Del Norte County recognizes the economic and biologic significance of maintaining and where possible enhancing marine resources, coastal waters and sensitive coastal habitats. General policies designed towards achieving these important goals are stated in this section. (1) The county seeks to maintain and where feasible enhance the existing utility of all marine and water resources. (3) All surface and subsurface waters shall be maintained at the highest level of quality to insure the safety of public health and the biological productivity of coastal waters. (4) Wastes from industrial, agricultural, domestic or other uses shall not impair or contribute significantly to a cumulative impairment of water quality to the extent of causing a public health hazard or adversely impacting the biological productivity of coastal waters.*	
Coastal Hazards/Shoreline Development **Coastal Act Section 30253** (in part) *New development shall: (a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard. (b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.* **Coastal Act Section 30235.***Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shoreline processes shall be permitted when required to serve coastal-dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline sand supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.* **Coastal Act Section 30236.** *Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for*	The project would not result in coastal hazards or shoreline development because Dr. Fine Bridge is approximately 7.6 river miles from the Pacific Ocean and 3.8 miles as a straight line distance from the Pacific Ocean. See Sections 2.2.1, *Hydrology and Floodplain,* and 2.2.3, *Geology/Soils/Seismic/ Topography,* for further information. The project is within a floodplain. However, the project would not impede or redirect flood flows, nor expose people to an increased risk in loss from flooding, tsunami, seiche, or mudflow. Commercial fishing or fishing related activities, facilities, or businesses would not be affected by the project during or after construction. The project would not alter the natural shoreline and does not include or affect water supply or flood control projects. During construction, hazardous materials (e.g., gas, oil, solvents, etc.) would not be stored within the bed, bank or channel of the river. Cranes and other large equipment that cannot be easily moved would be checked daily for leaks. Hazardous material clean up kits would be onsite at all times. In addition, BMPs would be used during and after construction to avoid and minimize any potential water quality impacts associated with storm water and erosion (see Section 2.2.2, *Water Quality and Storm Water Runoff*). In addition to BMPs, all disturbed areas would be revegetated with native species.

Coastal Act Chapter Three Policy Area	Coastal Act Consistency Analysis
protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat. **Del Norte County LCP (1983):** *(P-4) The County should restrict and control construction of roads in flood prone areas due to their growth inducement potential. (P-5) The Coastal Program's land use policy shall recognize that flood plains have unique and significant public values, including wildlife habitats or recreational, aesthetic and scientific value, open space, and groundwater recharge. The value of the flood plain as an environmental resource and public benefits to be derived from it should be considered.*	Therefore, the project is consistent with the coastal hazards policies of the Coastal Act.
Archaeological and Paleontological Resources	
Coastal Act Section 30244. *Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.* **Del Norte County LCP (1983):** *<u>Coastal-Dependent Development: Archaeological Resources:</u> In cooperation with the State Historic Preservation Office, where it is determined development would adversely affect archaeological resources reasonable mitigation measures shall be required.*	See Section 2.1.6, *Cultural Resources,* and Section 2.2.4, *Paleontology,* for a full analysis of these resources. There are no known cultural or paleontological resources within the project area. However, previously undiscovered cultural resources could be found during construction. Additionally, geologic units with the potential to contain paleontological resources occur within the project area and could be adversely affected by project activities under all build alternatives. Standard measures for accidental discovery of cultural or paleontological resources are included in the project. Therefore, the project is consistent with Coastal Act Policy 30244.

Avoidance, Minimization, and/or Mitigation Measures

The project is consistent with the California Coastal Act as described above, therefore no avoidance, minimization, and/or mitigation measures are needed.

2.1.1.4 Wild and Scenic Rivers

Regulatory Setting

Projects affecting Wild and Scenic Rivers are subject to the National Wild and Scenic Rivers Act (16 USC 1271) and the California Wild and Scenic Rivers Act (PRC 5093.50 et seq.).

There are three possible types of Wild and Scenic Designations:

1. **Wild:** undeveloped, with river access by trail only.
2. **Scenic:** undeveloped, with occasional river access by road.
3. **Recreational:** some development is allowed, with road access.

Affected Environment

The Smith River is part of the National Wild and Scenic Rivers System, a federal system created by Congress to recognize and protect rivers across the country. More than 300 miles of the Smith River system are designated as a Wild and Scenic River—a longer stretch than any other river in the United States. The Smith River system is also undammed for its entire length, making it the only major river system in California without dams. The Smith River Wild and Scenic River System was designated in January 1981 and re-designated in November 1990 with the creation of the Smith River National Recreation Area. The Smith River system is also part of the California Wild and Scenic Rivers System. Of its 325.4 miles of Wild and Scenic River designation, 78 miles are classified as wild, 31 miles as scenic, and 216.4 miles as recreational.

The Smith River system drains a rugged area of the Pacific Coast ranges just south of the Oregon border, west of the Siskiyou Mountains, and north of the Klamath River Watershed. The segment of the Smith River that encompasses the project area is designated "Recreational" under the federal and state Wild and Scenic River Acts. The designated segment is approximately 20 miles long, begins at the confluence of the Smith River Middle and South Forks, and runs to the mouth at the Pacific Ocean (NWSRS 2017). The Dr. Fine Bridge crosses the Smith River at the point where the river is transitioning into the coastal plain. Within the project limits, the river's riparian areas are bordered by a gravel plant, farmlands, wooded residential parcels, and a church.

Under the federal Wild and Scenic Rivers Act (WSRA), the administering agency for this segment of the Smith River is the National Park Service (NPS). Under the California Wild and Scenic Rivers Act, the California Resources Agency is responsible for coordinating activities of state agencies that may affect the rivers in the system; however, the CDFW usually takes the lead on Wild and Scenic Rivers Act consultations. CDFW and WSRA consultations typically occur during the permitting phase of a project.

Environmental Consequences

Build Alternatives

The project would have no adverse effect on the free-flowing characteristics of the Smith River. All build alternatives would result in a reduction of in-river structures and there would be no adverse effects on the qualities that qualify the river segment as wild and scenic. Under all build alternatives, river access for recreation would be limited during construction.

Section 4(f) Applicability

Section 4(f) of the Department of Transportation Act of 1966 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.” The project is not located within (nor would require the use of) these nearby publicly owned parks and recreation areas. However, the Smith River is designated a federal Wild and Scenic River, Recreational, which qualifies as a Section 4(f) property. During construction for the build alternatives, recreationalists would not be able to pass under the bridge during the duration of construction, therefore a 4(f) “use” has been determined. A *de minimis* finding for the 4(f) use is described in Appendix A. See Appendix A for additional information on Section 4(f).

National Park Service Wild and Scenic Rivers Consultation

Caltrans received a letter on April 15, 2013, from the NPS (Appendix E) stating that the NPS “does not believe that this project would have a long-term, significant impact on the Smith River’s designation or its Outstandingly Remarkable Values (ORVs) since Caltrans is proposing a new bridge using best management practices that would ultimately be more beneficial to the river’s designation than the existing bridge.”

Section 6(f) Applicability

As described under the Regulatory Setting of this section, Section 6(f) of the Land and Water Conservation Fund Act applies to projects that may require a change in land use of recreational properties that were acquired with Land and Water grants of any type. This project would not require the temporary or permanent use of any lands that were purchased with special funds, therefore Section 6(f) does not apply.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required.

2.1.1.5 Parks and Recreation Facilities

Regulatory Setting

There are no public parks or public recreation facilities in the project area. However, the Smith River is used for recreation and is under the jurisdiction and management authority of the California State Lands Commission. Pursuant to Section 84.5 of the California Streets and Highways Code, the State Lands Commission requires an evaluation of the feasibility of providing public access to Smith River as part of the project, including the following considerations:

- An assessment of public access needs at the project location, in addition to a benefit analysis of public access alternatives.
- A description of existing public access points and facilities in the project vicinity, including the existing condition of these resources and the entity responsible for maintenance.
- An assessment of existing constraints and hazards that could make on-site public access infeasible.
- A feasibility assessment of proposed on-site public access infrastructure, such as construction of trails, stairs, parking areas, trash cans, restrooms, etc.
- If on-site public access is infeasible, a feasibility assessment of alternatives, such as improving existing public access in the project vicinity or creating new public access points for the subject waterway within the project vicinity.
- Environmental impacts of providing public access.
- A conclusion on the feasibility of providing public access.

Affected Environment

The Smith River is used by recreationalists for boating, fishing, bird watching, and other activities. The CDFW Smith River Public Fishing Access along Fred D. Haight Drive and Ruby van Deventer County Park, located less than 1 mile downstream and approximately 2 miles upstream, respectively, provide public pedestrian and vehicular access, including boat launching, to the Smith River. Also, nearby are the Tolowa Dunes State Park, Lake Earl Wildlife Area, and Jedediah Smith Redwood State Park, located approximately 2.5 miles, 2.8 miles, and 4.4 miles away from the project, respectively (Figure 2-4).

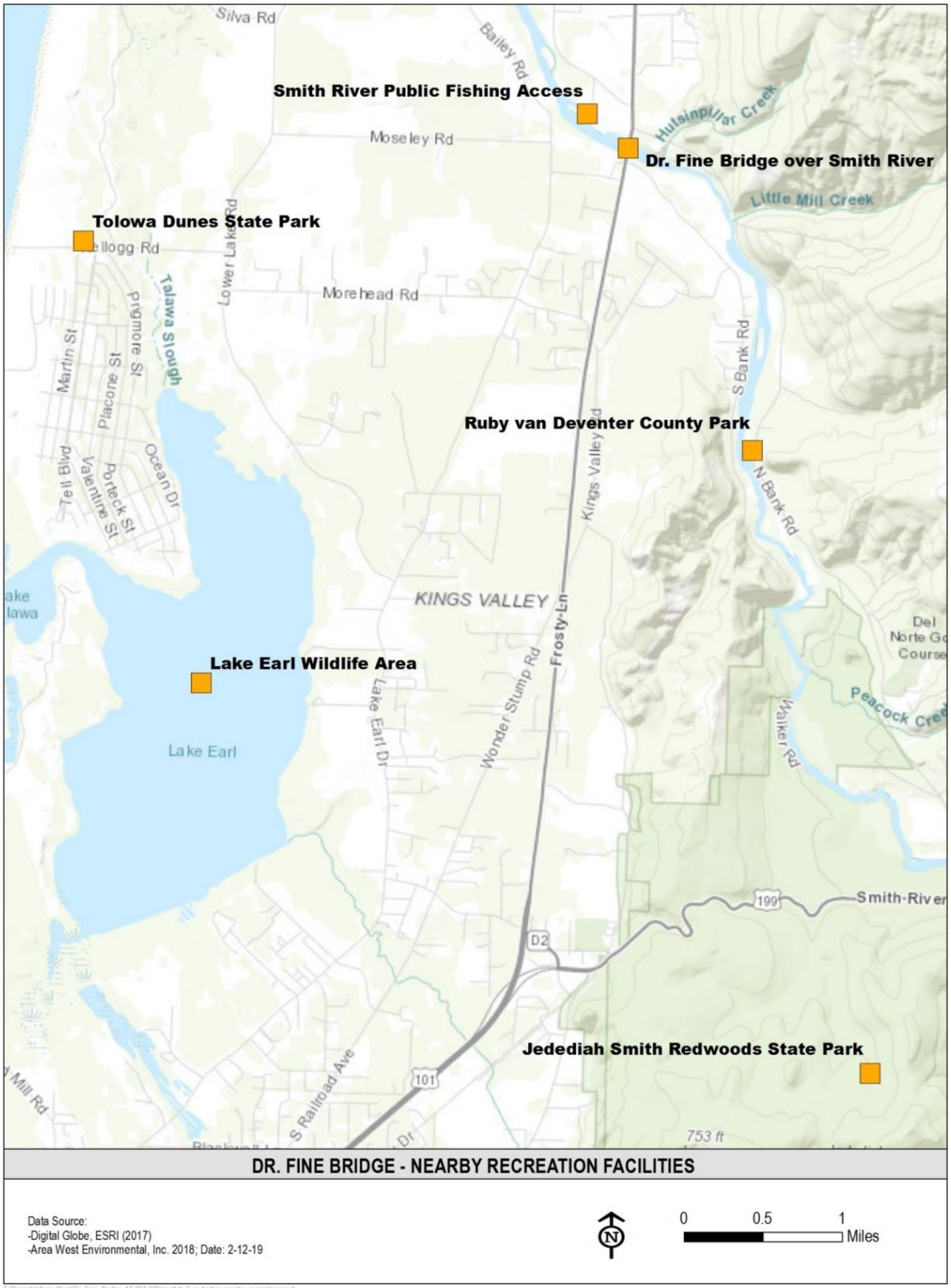


Figure 2-4. Recreational Facilities Near the Project

Environmental Consequences

Build Alternatives

Recreation

River-oriented activities that pass by the bridge would be temporarily limited during in-water construction activities. Under all build alternatives, temporary gravel berms would be constructed in the channel and temporary construction trestles would be built to span the western pearlshell mussel bed and thalweg (the deepest part of the channel) along the southern side of the river for summer in-water work (June 15 – October 15). Water-based recreation access would be limited from June 15th through October 15th during the construction season. After October 15th, the temporary gravel berm would be removed so the channel would be available again for boat passage. Outreach to the boating community would be conducted prior to and during construction.

Under Alternatives 1 and 2, the existing bridge would continue to be used during construction of the new bridge on a new downstream alignment and there would be no temporary closures of U.S. 101 that could affect recreationalists crossing the bridge.

Under Alternative 3A, Jack and Slide Detour Option, the project would temporarily close U.S. 101 for up to one week when the existing bridge is relocated onto temporary supports next to the new bridge. During the temporary closure, access would be available to U.S. 101 by using SR 197 and U.S. 199. This detour is not expected to significantly delay or prevent access to nearby recreational facilities.

Under Alternative 3B, Panel Bridge Detour Option, there would be no temporary closure of U.S. 101.

Under all build alternatives, the project would not permanently affect any recreational facilities or jeopardize or interfere with the protection of any existing recreational uses or lands.

Public Access

Under all build alternatives, during and following completion of the project, the Smith River Public Fishing Access along Fred D. Haight Drive and the Ruby van Deventer County Park, located less than 1 mile downstream and approximately 2 miles upstream, respectively, would continue to provide public pedestrian, vehicular, and boat launching access to the Smith River.

There is currently informal public access (vehicular, including boat launching, and pedestrian) to the Smith River under the existing bridge on the southern bank from South Bank Road. This area is on state-owned property and is not actively managed for public access, nor is the property designated a park, wildlife refuge, recreational area, or an official river access point. Also, the informal river access under the bridge has been frequently used for illegal dumping of trash into the waterway. Under all build alternatives, public access from South Bank Road during construction would be prohibited. After construction, vehicle access in this area would be prohibited by installation of boulders along South Bank Road. Pedestrian access would still be available.

Prohibiting vehicle access would benefit biological resources, reduce direct ground disturbance and erosion at the edge of the channel in this area, allow growth of riparian vegetation in the area that is currently used as an informal dirt road, and limit the amount of garbage and refuse that is currently being left on the bank and in the channel near the sensitive western pearlshell mussel bed.

Caltrans prepared a Public Access Feasibility Report (Caltrans 2019l) and determined that providing new public access to the Smith River for public recreational purposes was not practical within the existing and proposed right-of-way for the new bridge due to environmental and safety considerations. However, to ensure that the loss of vehicular access to the Smith River at the south bank of the Dr. Fine Bridge does not result in impacts on public access, a sign would be posted along South Bank Road providing information about other nearby sites that provide vehicular access and boat launching opportunities to the Smith River. Additionally, Caltrans will work with CDFW to improve signage to the Smith River Public Fishing Access off Fred E. Haight Drive. As noted in in Section 1.7.1.17, *Project Features, Standard Measures, and Best Management Practices Common to All Build Alternatives*, Caltrans is committed to a public outreach plan to ensure the public is aware that river access would be limited during construction activities. Outreach to the boating community would be conducted before and during construction to notify users of river closures.

On the northwest side of the bridge, a CCC Vertical Accessway (i.e., easement) is recorded, but not yet opened (Assessor Parcel Number 105-020-87). Recorded in 1979, the type of access is an Offer to Dedicate (OTD), a legal document that offers an easement across private land for a future public accessway. Access is often required as part of Coastal Development Permits. To open the accessway for public use, it must be accepted for management by a responsible agency and then improved and opened. The recorded OTD runs roughly parallel to U.S. 101 from Fred D. Haight Drive, down to the north bank of the Smith River, and along the northern riverbank for approximately 0.33 mile (CCC 2016). Implementation of Alternative 1 or 2 will require acquisition of ROW from this parcel but would not require ROW within the recorded OTD easement. Under all alternatives, the project would not affect the OTD for a future public accessway.

Avoidance, Minimization, and/or Mitigation Measures

> **Access-1**: **River Access and Signage.** Existing pedestrian access to the Smith River at the south side of the Dr. Fine Bridge will continue after project completion. Vehicular access will be prohibited to prevent illicit dumping and restore vegetation. A sign will be posted at this location providing information about nearby vehicular access and boat launching points. Additionally, Caltrans will work with CDFW to improve signage along Fred D. Haight Drive directing recreation users to the existing CDFW Smith River Public Fishing Access, located less than 1 mile downstream of the bridge. Caltrans will also coordinate with the Coastal Commission, CDFW and Del Norte County on possible enhancements that can be made at the CDFW Smith River Public Fishing Access.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.1.2 Farmlands/Timberlands

2.1.2.1 Regulatory Setting

NEPA and the Farmland Protection Policy Act (FPPA, 7 USC 4201-4209; and its regulations, 7 CFR Part 658) require federal agencies, such as the FHWA, to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

CEQA requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to deter the early conversion of agricultural and open space lands to other uses.

Impacts on timberland are analyzed as required by the California Timberland Productivity Act of 1982 (California Government Code Sections 51100 et seq.), which was enacted to preserve forest resources. Similar to the Williamson Act, this program gives landowners tax incentives to keep their land in timber production. Contracts involving Timber Production Zones (TPZ) are on 10-year cycles. Although state highways are exempt from provisions of the Act, the California Secretary of Resources and the local governing body are notified in writing if new or additional ROW from a TPZ would be required for a transportation project.

2.1.2.2 Affected Environment

Farmlands

Del Norte County is one of several counties in California that does not participate in the Williamson Act program. Additionally, the California Department of Conservation's Farmland Mapping and Monitoring Program has not produced an Important Farmland Map for Del Norte County. There are parcels zoned Agriculture General and Agriculture Exclusive in the project area.

Timberlands

There are some forested areas within and surrounding the project area. However, there are no areas within the project area that are actively managed for timber production.

2.1.2.3 Environmental Consequences

Build Alternatives

All build alternatives would require temporary staging and access in parcels zoned as Agriculture General and Agriculture Exclusive. Alternatives 1 and 2 would also require the permanent acquisition of 0.11 acre of agricultural land (Table 2-1). This area consists of a small, linear, roadside strip of land near the intersection of U.S. 101 and Lake Earl Drive (Figure 2-1). The 0.11-acre area that would be converted from agricultural use under Alternatives 1 and 2 is a negligible portion (0.04 %) of a large 301.76-acre agricultural parcel. The retaining wall on the southwest side of the project area was incorporated into the design of Alternatives 1 and 2 to reduce the area of permanent impacts on actively farmed agricultural areas. According to FHWA and NEPA, to the extent feasible, measures to reduce impacts are considered whether the impacts are significant or not. Caltrans is coordinating with NRCS and has submitted the AD 1006 form to acquire the Farmland Conversion Impact Rating for the downstream alternatives. Alternative 3A/3B would not require a site rating as no permanent conversion would be required.

Under all build alternatives, agricultural land would be temporarily used for equipment staging, materials storage, parking, and water infiltration for dewatering activities. Project dewatering likely would include the use of a temporary infiltration basin. The basin could be constructed by excavating to a depth of up to approximately 2.5–4.0 feet below the surface. The excavated material would be compacted around the perimeter of the basin and lined with geotextile fabric to prevent erosion. Excess fill material would be stockpiled with appropriate BMPs and used to restore the basin area to its original contour and grade.

All temporarily occupied agricultural lands would be restored to pre-construction conditions after project completion.

Under all build alternatives, the project would not affect timberland and no new or additional ROW would be required from a TPZ. There would be no impact.

2.1.2.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.1.3 Utilities/Emergency Services

2.1.3.1 Affected Environment

There are four utilities within the project area. They include Frontier and Charter phone and cable, Pacific Power, and a USGS Gage Station. Currently, Frontier and Charter have buried cables that approach both ends of the structure and then cross the river on the west side as aerial lines. These overhead cables would have to be temporarily relocated during the project, then rerouted after the project is completed.

An underground fiber optic cable approaches the project area from the east along SR 197 that is buried and would need to be temporarily relocated. There are two poles in conflict where Pacific Power crosses the project area on the north end of the structure. There is also a USGS Gage Station currently located on the northeast side of the bridge with an associated power.

Law enforcement and fire protection services in the project vicinity are provided by the Del Norte County Sheriff’s Department, Fork Dick Fire Protection District, Smith River Fire Protection District, and CAL FIRE. The nearest hospital is 8 miles south of the project in Crescent City.

2.1.3.2 Environmental Consequences

Build Alternatives

Under all build alternatives, no substantial disruption of service is anticipated, and no utilities or emergency services would be permanently affected by the project. Several utility poles would need to be relocated prior to construction. Overhead phone and cable lines would be temporarily attached to the existing or detour bridge during the project, then rerouted to conduit in the new bridge after the project is completed. The fiber optic cable that approaches the project area from the east along Route 197 would also be temporarily relocated.

Power to the Pacific Power poles would be rerouted for the duration of the project, although power would be maintained around the structure to service streetlights and the bridge bike warning system.

The USGS Gage Station would be temporarily relocated to the east along the river, then remounted to the new bridge after completion. The electrical service drop for the USGS Gage Station on the northeast side of the structure would be removed during construction, then replaced after the project is complete.

Under Alternatives 1 and 2, the existing bridge would continue to be used during construction of the new bridge on a new alignment; therefore, there would be no impact on emergency services.

Under Alternative 3A, the Jack and Slide Detour Option, there would be a temporary closure of U.S. 101 for up to one week. During this time, traffic would be rerouted to U.S. 199 and SR 197. One-way controlled traffic would be needed to allow trucks to pass through. The detour time delay may be up to one hour. Once the detour bridge is in place, U.S. 101 would be reopened to continuous two-way traffic for the duration of the project.

Under Alternative 3B, Panel Bridge Detour Option, there would be no temporary closure of U.S. 101.

Emergency vehicles are exempt from road lane closures, and effort would be made to allow police and fire vehicles to pass through construction zones without delay. Proper notification and advanced warning to nearby emergency service providers would ensure adequate egress and ingress for emergency service personnel.

2.1.3.3 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, mitigation measures are proposed.

2.1.4 Traffic and Transportation/Pedestrian and Bicycle Facilities

2.1.4.1 Regulatory Setting

Caltrans, as assigned by FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation (USDOT) issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by USDOT regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 USC 794). FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

2.1.4.2 Affected Environment

U.S. 101 within the project area is part of the Pacific Coast Bike Route. This route, originally developed in 1976, begins in Washington at the Canadian border and continues south through California to the Mexican border. In addition to touring cyclists, local bicycle commuters use the Dr. Fine Bridge as a connection to Lake Earl Drive and Fred D. Haight Drive. The Dr. Fine Bridge is the only connection for bicycles crossing the Smith River without detouring to SR 197 and U.S. 199; this detour would be approximately 11 miles and includes areas of roadway with variable shoulder widths. Effective September 2014, California Vehicle Code Section 21760 requires:

> "*A driver of a motor vehicle shall not overtake or pass a bicycle proceeding in the same direction on a highway at a distance of less than three feet between any part of the motor vehicle and any part of the bicycle or its operator*."

The existing bridge has 1-foot shoulders, 21-inch concrete railings, and curbs without sidewalks. Without an 8-foot shoulder, the required passing room for large trucks and semi-trailer trucks to ensure the safety of bicyclists would not be satisfied; large vehicles would not have adequate room to maneuver safely around the bicyclist without potentially encroaching into the other lane and/or slowing down traffic to allow safe passage of the bicyclist.

Traffic and transportation policies and priorities for the region are also described in the 2011 Regional Transportation Plan, which recognizes providing safety for bicyclists as an important transportation need and identifies the existing Dr. Fine Bridge as an example of such need (Del Norte Local Transportation Commission 2016. Additionally, the transportation section of the Del Norte General Plan, under Goal 8.A. for state highways, identifies the need “To plan for the long-range planning and development of Del Norte County's State Highway system to ensure the safe and efficient movement of people and goods” (Del Norte 2003). Policy I-2 of the Del Norte County Bicycle Facilities Plan is to “Support the construction of bicycle facilities that connect work, school, shopping, recreation, and other activity centers” (Del Norte 2010). Furthermore, some of the public comments received about the project during scoping and IS/MND review indicate a strong desire for safe bicycle access.

Current and Forecasted Traffic

Route 101, Post Miles 35.8 to 36.5

The daily peak-hour volume from the 2015 Caltrans data is 800 vehicles per hour and an Annual Average Daily Traffic (AADT) count of 7,210 vehicles per day. The traffic data and projections can be summarized as follows:

AADT (2014): 7,210 Peak Hour (2015): 800
AADT (2021): 7,940 Peak Hour (2021): 930
AADT (2031): 8,970 Peak Hour (2031): 1,050
AADT (2041): 10,000 Peak Hour (2041): 1,170
Directional percent (percent of peak hour traffic in the peak direction): 60
Directional Hour Truck percent: 6.0

Route 197 (Detour for Alternative 3A), Post Miles 5.0 to 7.1

The daily peak-hour volume from the 2014 Caltrans data is 250 vehicles per hour and an AADT count of 1,800 vehicles per day. The traffic data and projections can be summarized as follows:

AADT (2014): 1,800 Peak Hour (2014): 250
AADT (2021): 2,040 Peak Hour (2021): 290
AADT (2031): 2,380 Peak Hour (2031): 340
AADT (2041): 2,720 Peak Hour (2041): 380

Directional percent: 60

Directional Hour Truck percent: 8.0

Collision Analysis

Between 2007 and 2017, there have been three fatalities and two critical injuries in two separate head on collisions on the Dr. Fine Bridge.

Collision rates below were taken from the Traffic Accident Surveillance and Analysis System (TASAS), Caltrans' electronic database of accident history, January 1, 2011, to December 31, 2013. The collision rates are summarized in the table below.

Table 2-3. TASAS Collision Rate Summary for Del Norte U.S. 101 Post Miles 35.8 to 36.5

Accident Type	Actual Accident Rates* (Collisions/MVM**)	Average Accident Rates* (Collisions/MVM**)
Fatal	0.000	0.017
Fatal plus injury (F + I)	0.00	0.21
Total	1.32	0.51

* Data from January 1, 2011 thru December 31, 2013
**Rates are in collisions per million vehicle miles (MVM)

From TASAS Table B, the actual "Total" collision rate is 2.6 times greater than the statewide average for similar highway facilities.

A draft Transportation Management Plan was prepared for Alternative 3A to address short-term disruptions in existing circulation patterns and access limitations during the construction of the temporary detour bridge proposed under this alternative (Caltrans 2015b). Additionally, a Transportation Management Plan Update was developed to address potential short-term disruptions in existing circulation patterns under all build alternatives (Caltrans 2018). Farm equipment would remain subject to California Vehicle Code Sections 36000-36800 for accommodation through the project area.

Consideration for Bicycles

- A bicycle with panniers attached is 3 feet wide maximum width.
- 1 to 2 feet of clearance is required between the right side of a bicycle and fixed objects at the edge of highway pavement such as guardrail or bridge railing.
- The Three Feet for Safety Act (California Vehicle Code 21760) states, "A driver of a motor vehicle shall not overtake or pass a bicycle proceeding in the same direction on a

highway at a distance of less than three feet between any part of the motor vehicle and any part of the bicycle or its operator."

Caltrans Design Information Bulletin 79-03, Table 2, includes standards for shoulder width on conventional two-lane highways based on traffic volumes (Average Daily Traffic, in vehicles, or Average Daily Traffic [ADT]). On a bridge, the standards are 8-foot shoulders when the ADT is above 1,000.

2.1.4.3 Environmental Consequences

Build Alternatives

Under Alternatives 1 and 2, the existing bridge would continue to be used during construction of the new bridge on a new alignment and there would be no temporary closure of U.S. 101.

Under Alternative 3A, Jack and Slide Detour Option, there would be a temporary closure of U.S. 101 for up to one week while the existing bridge is moved onto temporary foundations on the upstream side. During this time, traffic would be rerouted to U.S. 199 and SR 197. One-way controlled traffic would be needed to allow trucks to pass through. The detour time delay may be up to one hour. Once the detour bridge is in place, U.S. 101 would be reopened to continuous two-way traffic for the duration of the project. The detour time delay may be up to one hour. Once the detour bridge is in place, the speed limit on the detour bridge would be 35 mph (reduced from the current 55 mph).

Under Alternative 3B, Panel Bridge Detour Option, there would be no temporary closure of U.S. 101.

Under all build alternatives there may be some short-term one-way closures during construction. The Transportation Management Plan Update includes standard measures that would be implemented to minimize potential short-term disruptions in existing circulation patterns under all build alternatives (Caltrans 2018). During construction, bicyclists would be affected by temporary lane closures, short-term use restrictions, as well as the presence of construction workers, vehicles, and materials. However, under all build alternatives pedestrian and bicycle access would be maintained during construction. Additionally, the contractor would be required to minimize any access delays to driveways or public roadways within or near the work zones.

All build alternatives would increase safety for all residents and the traveling public by replacing the current bridge with a new bridge designed to meet all safety standards and upgrade the facility to current design standards. All build alternatives would increase shoulder widths to 8 feet to improve safety for vehicles, pedestrians, and bicyclists. Eight-foot-wide shoulders are likely to result in a benefit to non-motorized transportation by providing a consistent, evenly paved surface on which to travel. On a bridge, the standards are 8-foot shoulders when the ADT is above 1,000. Highway shoulders provide (AASHTO 2011):

- Space for emergency storage of disabled vehicles.
- Space for enforcement activities.
- Space for maintenance activities.
- Space for drivers to maneuver to avoid crashes.
- Space for bicycle accommodation.
- Clear recovery area.
- Improved stopping sight distance on horizontal curves.
- Space to store and carry water during storms.
- Improved capacity by increasing driver comfort.

Based on the 2010 Highway Safety Manual, as amended in 2016, on rural two-lane, two-way roadway segments, there is an estimated 38 percent reduction in collisions involving non-standard shoulder width by increasing shoulder width from 1 foot to 8 feet and an estimated 19 percent reduction in collisions involving non-standard shoulder width by increasing shoulder width from 5 feet to 8 feet. Widening existing shoulders to 8 feet is expected to reduce the frequency of collisions within the project limits and provide all bicyclists with adequate room to traverse highway shoulders. Once in place, the new bridge would not increase traffic capacity, cause traffic delays, or result in traffic congestion along the route.

Under all build alternatives, Caltrans proposes to construct the bridge corridor in a manner that would be fully compliant with the requirements of the ADA. This includes designing and building for ADA access to and from the bridge. A barrier rail is proposed between the 6-foot-wide separated walkway (width allows two wheelchairs to pass) and 8-foot shoulders. Caltrans Design Information Bulletin (DIB 82-05) “Pedestrian Accessibility Guidelines for Highway Projects” requires accessibility design standards unless it is technically/structurally infeasible. The separated pedestrian walkway would provide safe pedestrian access that is currently not available. Pedestrian access over the new bridge would also afford safe views of the Smith River valley.

2.1.4.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no change to existing conditions for vehicles, cyclists, and pedestrians would occur.

2.1.5 Visual/Aesthetics

2.1.5.1 Regulatory Setting

NEPA of 1969 as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 USC 4331[b][2]). To further emphasize this point, the FHWA, in its implementation of NEPA (23 USC 109[h]), directs that final decisions regarding projects are to be made in the best overall public interest, taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

CEQA 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" (PRC 21001[b]).

2.1.5.2 Affected Environment

A Visual Impact Assessment (VIA) for the proposed project was completed in July 2015 (Caltrans 2015c). Due to changes to the project description, additional review was completed in 2017 and 2019 to ensure the VIA remained valid and to evaluate multiple alternatives (Caltrans 2019a).

The project is located near the Northern California coast. This region encompasses mountains, hills, valleys, and plains as part of the northern California Coast Ranges, which are close enough to the Pacific Ocean for the climate to be greatly modified by marine influence. The project site is approximately 5.6 miles east from the mouth of the Smith River and is part of the western edge of the ecological subregion known as the Crescent City Plain and in close proximity to the eastern edge of the Northern Franciscan subsection (Miles and Goudey 1997).

The project is within an area noted for its scenic quality and beauty. The highway is not designated as a California State Scenic Highway; however, it is eligible to obtain Scenic Highway status.

Observations from the bridge provide views of the Smith River and its surrounding landscape of coniferous, deciduous, and riparian vegetation. Views from the road, as one approaches the bridge from the south side, are open as views extend beyond the foreground of the landscape, with a few residential homes on the west side and the quarry on the east side of the highway. The highway on the north side of the bridge is characterized by dense vegetation that seems to enclose the highway, then eventually opens up to cultivated fields.

There are several key views that can be seen by motorists traveling north and south on U.S. 101. Figures 2-5 and 2-6 below are the views that travelers have while driving north and south. Figures 2-7 and 2-8 are the views that travelers have looking west and east.

2.1.5.3 Environmental Consequences

Build Alternatives

The VIA determined that all build alternatives would lead to visual changes of the highway, including wider shoulders, a separated pedestrian walkway, upgraded bridge rails, pedestrian rail, cut and fill slopes, a new bridge span, and retaining walls. Alternatives 1 and 2 would require viaducts and an alignment shift to the west. Alternative 3 would stay on the existing alignment and require two retaining walls on the upslope at the U.S. 101/197 intersection. Vegetation removal would occur under all alternatives due to construction access, roadway widening, and alignment shifts.

Figure 2-5. Photo Facing Northbound at Dr. Fine Bridge

Figure 2-6. Photo Facing Southbound at Dr. Fine Bridge

Figure 2-7. View Facing West from the Bridge Deck

Figure 2-8. View Facing East from the Bridge Deck

Alternatives 1 and 2 would primarily require vegetation removal on the west side of the existing highway, with some on the southeast side. Alternative 3 would require vegetation removal east and west of the highway.

Viewers include both highway neighbors and highway travelers. Neighbors are predominantly from residences to the west, attendees of the Calvary Chapel of the Redwoods, and recreationists on the river. Travelers are primarily local traffic and tourists. There are more highway travelers than there are neighbors. Highway travelers do not have views of the bridge span, but have very close exposure to proposed structure elements, including the bridge, viaducts, and upslope retaining walls. On average, it is anticipated that both viewer groups would be sensitive to any changes to the visual environment within the project corridor.

Low growing vegetation removal along the highway would lead to temporary visual impacts but tree removal required would lead to permanent visual impacts. It is anticipated that Alternatives 1 and 2 would lead to adverse visual impacts for the residences and church located northwest of the bridge as the viewers would have new views of the highway, retaining wall, and viaduct where there was once a dense vegetated screen. It is anticipated that Alternative 3 would lead to adverse visual impacts for the residence located northeast of the bridge due to tree and vegetation removal and new views of the highway. Additionally, there is a potential for all alternatives to result in new views of the western edge of the active quarry due to vegetation and tree removal when traveling southbound on the bridge.

Under all build alternatives, the new structure would be basic grey, consistent with the shade of concrete. Aesthetic features are designed into the bridge railings such as a see-through barrier type that is consistent with other barrier rails on the coast, Tolowa Dee-Ni' Nation and Elk Valley Rancheria Tribal patterns, and context-sensitive architectural treatment is proposed on all retaining walls. The "see through" barrier rail and pedestrian railing color have not been determined, but color choices (including leaving the rail galvanized) are anticipated to be in harmony with the existing natural environment. The replacement bridge would be brighter due to the newness of the structure, which could also produce glare. Over time, the replacement bridge and its materials would naturally weather, and any potential glares would decrease.

Under all build alternatives, when compared to the existing bridge, the new bridge would have fewer piers in the river channel and would provide a less obtrusive and more visually appealing structure. Additionally, overhead utilities that are currently visible when looking west from the bridge, will be relocated and no longer visible under all build alternatives, resulting in a positive visual impact.

Under all build alternatives, the dominance and scale of the new bridge would be in character with the existing structure. The bridge in the immediate area would dominate the landscape but would not diminish the visual quality of the area. The scale would be larger than the existing bridge due to the increase in the width, and for Alternatives 1 and 2, increase in length due to viaducts. The height would remain relatively the same. In general, the cast-in-place alternatives (Alternative 1 and 3) allow for wider spacing between piers and parabolic soffits, whereas under the pre-cast alternative (Alternative 2) piers would be more closely spaced and the bridge would have uniform soffits.

Two viaducts are proposed for Alternatives 1 and 2 at the north and south ends of the bridge. The viaducts would have the same visual characteristics and elements as the bridge. Vehicle barrier rails and pedestrian railing would be continued for the extent of the viaduct on the west side. Railings would not be required on the east side as the viaducts would be at ground level. Additional pier supports would be required for the viaducts in locations where piers currently do not exist. These additional elements would result in more geometric forms and lines as well as overall dominance of the structures in the landscape, as seen by nearby residents, church members, and recreationists from below the bridge.

All alternatives would require the installation of retaining walls, as is Caltrans practice where feasible, an architectural treatment would be included to lessen the contrast of the walls to the surrounding environment, maintaining more natural colors and textures. Forms and lines would still be geometric in shape. Walls would be located downslope from the highway for Alternatives 1 and 2. Walls would be located downslope and upslope from the highway for Alternative 3. It is not uncommon to see retaining walls on the U.S. 101 corridor and SR 197/U.S. 199 in northern Humboldt and Del Norte Counties.

Under all alternatives retaining walls and viaducts would become less visible over time due to vegetation regrowth. Walls may be stained with earthen hues in order to blend with the natural environment and to make them more visually appealing. The bioswales and/or biostrips associated with the new bridge would be visible to the traveling public, however, they are vegetated features that appear naturalized in the landscape and would be consistent with the existing visual character and quality.

Under all build alternatives, the most prominent visual impact is a result of vegetation removal, tree removal, and retaining wall installation. It would take several years for vegetation to regenerate. Until then, the removal of vegetation would create negative visual impacts. Visual impacts due to vegetation removal would be lessened by the standard practices of replanting affected riparian and wetland areas with regionally appropriate native plants, by regrading and revegetating temporary staging areas, and by minimizing the removal and damage to root systems of existing trees and vegetation.

Temporary visual impacts created during construction would include areas for staging of equipment and materials. The construction zone would have vehicles, heavy equipment, and material required for construction. Passing vehicles may experience a lane closure and subsequent shifting of lanes. Construction sites typically have orange cones and K-rail to direct traffic.

Night work during certain activities is anticipated for all build alternatives in order to complete the project within the proposed timeframe. The bridge approach roadway work under all alternatives would require night lighting for a maximum of two weeks (not consecutively). These temporary visual impacts are part of the general construction landscape and do not require further consideration. Temporary impacts would cease when construction is completed and vegetation has regrown.

Figures 2-9 through 2-14 show the existing conditions and a photo-simulation of Alternatives 1 and 3 from four key views; Alternative 1 simulations represent both Alternative 1 and 2 build conditions. Key view 1 (traveling southbound on the bridge) and Key View 2 (traveling northbound just north of the bridge) are associated with travelers. Key view 3 (looking east from the Smith River to the bridge) and Key View 4 (looking east from near the Calvary Chapel of the Redwoods) are associated with neighbors.

Figure 2-9. Existing View and anticipated tree/vegetation removal areas for Build Alternatives at Key View 1- Traveling southbound on the bridge

Figure 2-10. Existing View and anticipated tree/vegetation removal areas for Alternatives 1 and 2 at Key View 2- Traveling northbound just north of the bridge

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Figure 2-11. Existing View and anticipated tree/vegetation removal areas for Alternatives 3 at Key View 2- Traveling northbound looking east just north of the bridge

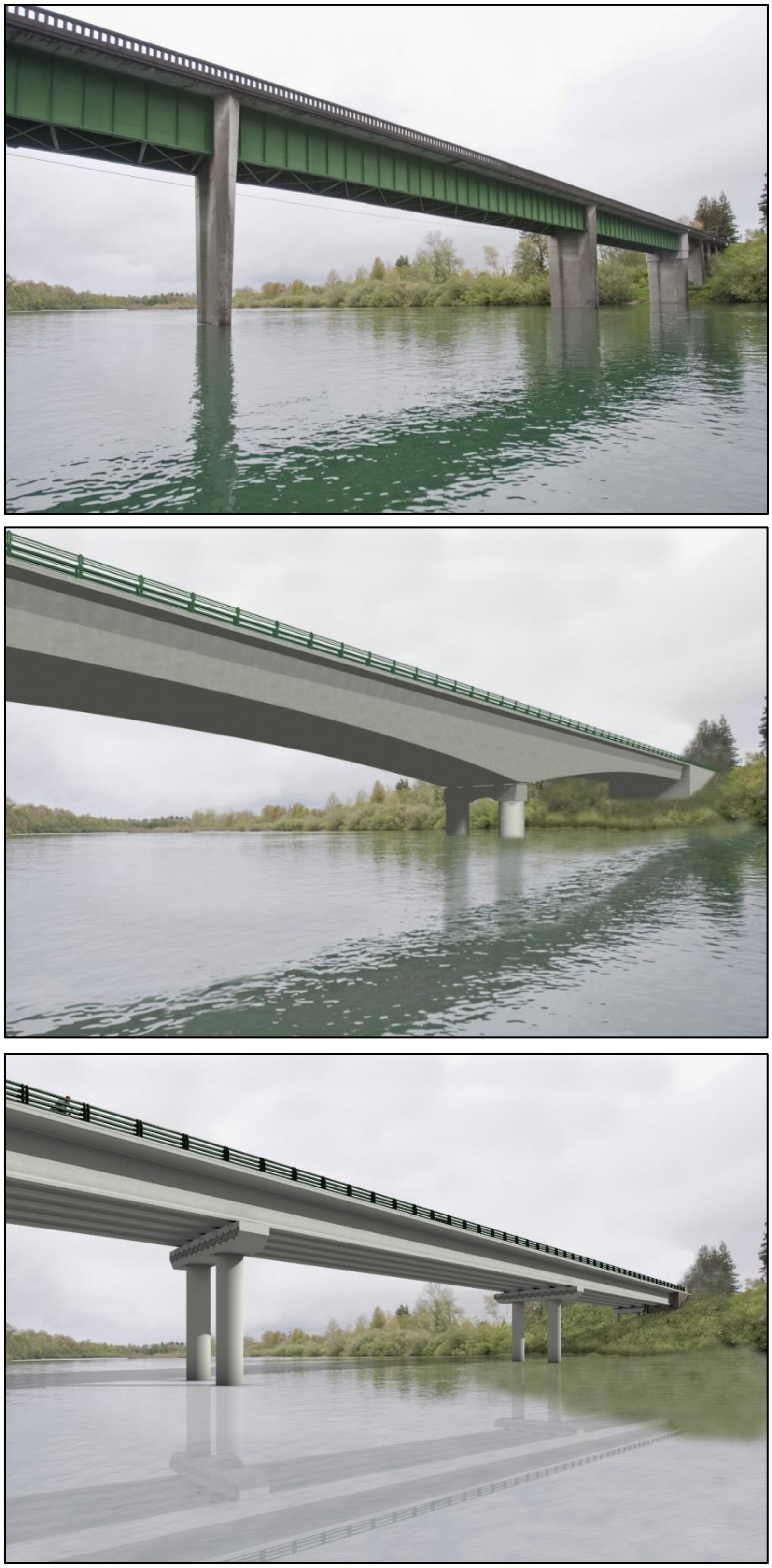


Figure 2-12. Existing View (top) and Photo-simulations for Alternatives 1 and 3 (middle), and Alternative 2 (bottom) at Key View 3- Looking northeast from the Smith River to the bridge

Figure 2-13. Existing View and anticipated tree/vegetation removal areas for Alternatives 1 and 2 at Key View 4- Looking east from near the Calvary Chapel of the Redwoods

2.1.5.4 Avoidance, Minimization, and/or Mitigation Measures

Visual-1: Boulders on South Bank Road. Boulders placed on the south bank to inhibit vehicular access from South Bank Road would match the color of existing stone within the project area to blend with the natural surrounding environment.

Visual-2: **Retaining Wall Railing.** Color the cable railing located on the top of the retaining walls.

Visual-3: Bridge Railings. Color galvanized steel bridge railings. Consider a unique color that would enhance visual character and memorability of the bridge or a color that blends in with the surrounding scenic landscape.

Visual-4: Architectural Treatment on Concrete Barrier. For Alternative 3, include architectural treatment, such as a relief pattern, on any solid concrete barrier in front of the retaining walls. The treatment should be context sensitive and take into consideration public input.

Visual-5: Screen Nearby Residences and Traveling Public. For the build alternatives, plant trees and shrubs to screen residences from the highway and retaining walls, as well as the traveling public from the quarry.

Visual-6. Screen Views from Chapel. For Alternative 1 and 2, screen the Chapel from views of the highway and retaining walls by planting native trees and shrubs.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.1.6 Cultural Resources

2.1.6.1 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 following:

The National Historic Preservation Act of 1966 (NHPA), as amended, sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places (NRHP). Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the A C HP [36 CFR 800]. On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA), among the FHWA, the ACHP, the State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with FHWA involvement. The PA implements the ACHP's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA's responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Program (23 USC 327).

CEQA requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California 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 5020.1(j). In 2014, Assembly Bill (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 on them). Defined in PRC 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 21083.2. PRC 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires Caltrans to inventory state-owned structures in its rights-of-way.

2.1.6.2 Affected Environment

Multiple cultural resource studies have been conducted for the Dr. Fine Bridge replacement project and are listed below:

- Archaeological Survey Report and Extended Phase I Results for the Proposed Geotechnical Drilling for the Dr. Fine Bridge Replacement Project (Caltrans 2008a).
- Dr. Fine Bridge Geotech Study Extended Phase I Investigations (Caltrans 2008b).

- Extended Phase I Subsurface Geoarchaeological Investigations for the Dr. Fine Bridge Replacement Project, U.S. 101, Del Norte County, California (Caltrans 2011).
- Archaeological Survey Report for the Dr. Fine Bridge Replacement Project (Caltrans 2014b).
- *Historic Property Survey Report* (Caltrans 2014c).
- Supplemental Archaeological Survey Report (2019o)
- *Supplemental Historic Property Survey Report* (Caltrans 2019b).

The Area of Potential Effects (APE) was established to include all areas that have the potential to be disturbed or used as part of this undertaking. This includes all areas where construction activities are planned to occur, all potential construction easements, all potential staging areas, and all potential temporary storage locations. The APE was revised in 2019 to include the two potential staging areas, including the one southwest of the existing bridge, and a cultural resources survey was completed for this area (Caltrans 2019b). All areas of potential construction activities would experience ground disturbance to a minimum depth of 6 to 12 inches through clearing and grading activities. In areas where bridge foundations would be constructed, the depth of disturbance could reach to 100 feet or more; however, the majority of disturbance is likely be to the top 20 feet of the soil column. Locations of deeper impacts would be limited to the areas of the bridge piers and abutments, as well as areas where the old piers and abutments would be removed. The dewatering area, currently proposed in the southwest portion of the project area, could require ground disturbance to approximately the top 2.5 to 4.0 feet of soil for an infiltration basin.

In addition to the records and inventories listed below, several parties were consulted to complete the Historic Property Survey Report. Parties consulted included the Del Norte Community Development Department, the Tolowa Dee-Ni' Nation Tribal Heritage Preservation Officer, the Tolowa Dee-Ni' Nation Tribal Council, the Elk Valley Rancheria Tribal Heritage Preservation Officer, and the Native American Heritage Commission. The following records and inventories were consulted for the Historic Property Survey Report:

- National Register of Historic Places, 1979-2002 and supplements.
- California Register of Historical Resources, 1992, and supplemental information to date.
- California Inventory of Historic Resources, 1976.
- California Historical Landmarks, 1995, and supplemental information to date.
- California Points of Historical Interest, 1992, and supplemental information to date.

- State Historic Resources Commission, 1980 to present, Minutes from quarterly meetings.
- Caltrans Historic Highway Bridge Inventory, 2006, and supplemental information to date.
- North Coastal Information Center, Klamath CA.
- State Lands Commission Shipwreck database.
- Caltrans Cultural Resource Files.
- Caltrans Cultural Resource GIS Database.

Caltrans contacted the State Lands Commission to request a review of their shipwreck database to determine if there are any known shipwreck records in the area. No response to this inquiry had been received at the time of this writing.

The records search, research, and archaeological inventory did not result in the discovery of any cultural or historical resources within the APE. There are no known shipwrecks in the project vicinity.

2.1.6.3 Environmental Consequences

Build Alternatives

Based on the results of the Historic Property Survey Report (Caltrans 2014b), Archaeological Survey Report (Caltrans 2014c), and the Supplemental Historic Property Survey Report (Caltrans 2019b), there are no cultural and historical properties in the project area. However, the project is within an area of high sensitivity for buried archaeological deposits and tribal cultural resources. A geoarchaeological study conducted by Meyer and Kaijankoski (2011) demonstrated that, although there clearly appears to have been significant tribal use in and around this location, there is little possibility of any physical remnants (archaeological sites) associated with this use to still exist. Nevertheless, there remains the possibility of discovering a previously unknown buried resource during construction.

No Section 4(f) historic resources are within the project vicinity. Under all build alternatives, there will be no historic properties affected by the project.

2.1.6.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

2.2.1.1 Regulatory Setting

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance are outlined in 23 CFR 650 Subpart A. To comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments.
- Risks of the action.
- Impacts on natural and beneficial floodplain values.
- Support of incompatible floodplain development.
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as "the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year." An encroachment is defined as "an action within the limits of the base floodplain."

2.2.1.2 Affected Environment

The Smith River originates in the Siskiyou Mountains and flows approximately 25.1 miles through the Rogue River–Siskiyou National Forest, Six Rivers National Forest, and Jedediah Smith Redwoods State Park, and discharges into the Pacific Ocean approximately 8 miles downstream from the project area. The Smith River is the largest perennial river in California that flows unobstructed with no human-made structures that impede flow or fish migration (e.g., dams, irrigation diversions) for its entire course.

The Smith River channel has a steep longitudinal slope and is entrenched in bedrock through much of Del Norte County. The slope reduces and there is more floodplain connectivity through the 10-mile reach upstream of the Dr. Fine Bridge. The river through the 10-mile reach upstream of the project site has a sinuous planform (meandering channel) with several point bars. At the project site, the river has a channel slope of 0.0012 (0.12%) and a meandering riffle/pool planform. The channel form at the project site is suspected to have been altered by the natural after effects of gravel mining, timber harvesting, and bank stabilization features upstream of the site.

A Final Hydraulic Report (Caltrans 2016d) was prepared for the project to verify the build alternatives would meet hydraulic requirements for the structure as well as avoid impacts to the floodplain. The project area is in an area mapped by the Federal Emergency Management Agency (FEMA) as part of the 100-year flood (Zone AE) with a base flood elevation identified (Figure 2-14) (FEMA 2010). A portion of U.S. 101 and an existing road south of the bridge are located on fill with an elevation above the 100-year flood zone and excluded from the FEMA flood zone.

A Scour Effects Analysis Report (Caltrans 2019m) was prepared to evaluate changes to river hydraulics that may be affected by the proposed build alternatives. The analysis used a hydraulic model to simulate existing and proposed conditions, as well as interim conditions expected during construction. The 2019 revised analysis and report expanded on previous work and reflect current alternative designs and expected construction methods under each alternative. The intent of the analysis was to gain information about the temporary and permanent effects the temporary construction facilities (e.g., gravel berms, work trestles, falsework, and bridge structures) and proposed build alternatives would have on the hydraulics and geomorphology of the Smith River.

To identify potential changes to river hydraulics, a two-dimensional hydrodynamic numerical model of the Smith River was developed and multiple scenarios of temporary and permanent bridge configurations were simulated. Topographic and bathymetric data were compiled from survey data and supplemental survey data obtained for the analysis. Scenarios analyzed included the existing bridge, the three proposed build alternatives, and two temporary construction configurations for each alternative (the construction phase and the demolition phase) that include a combination of work trestles and temporary gravel berms installed only during the summer months. A range of flow rates, including peak summer flows and the 100-year flood, were simulated with the model.

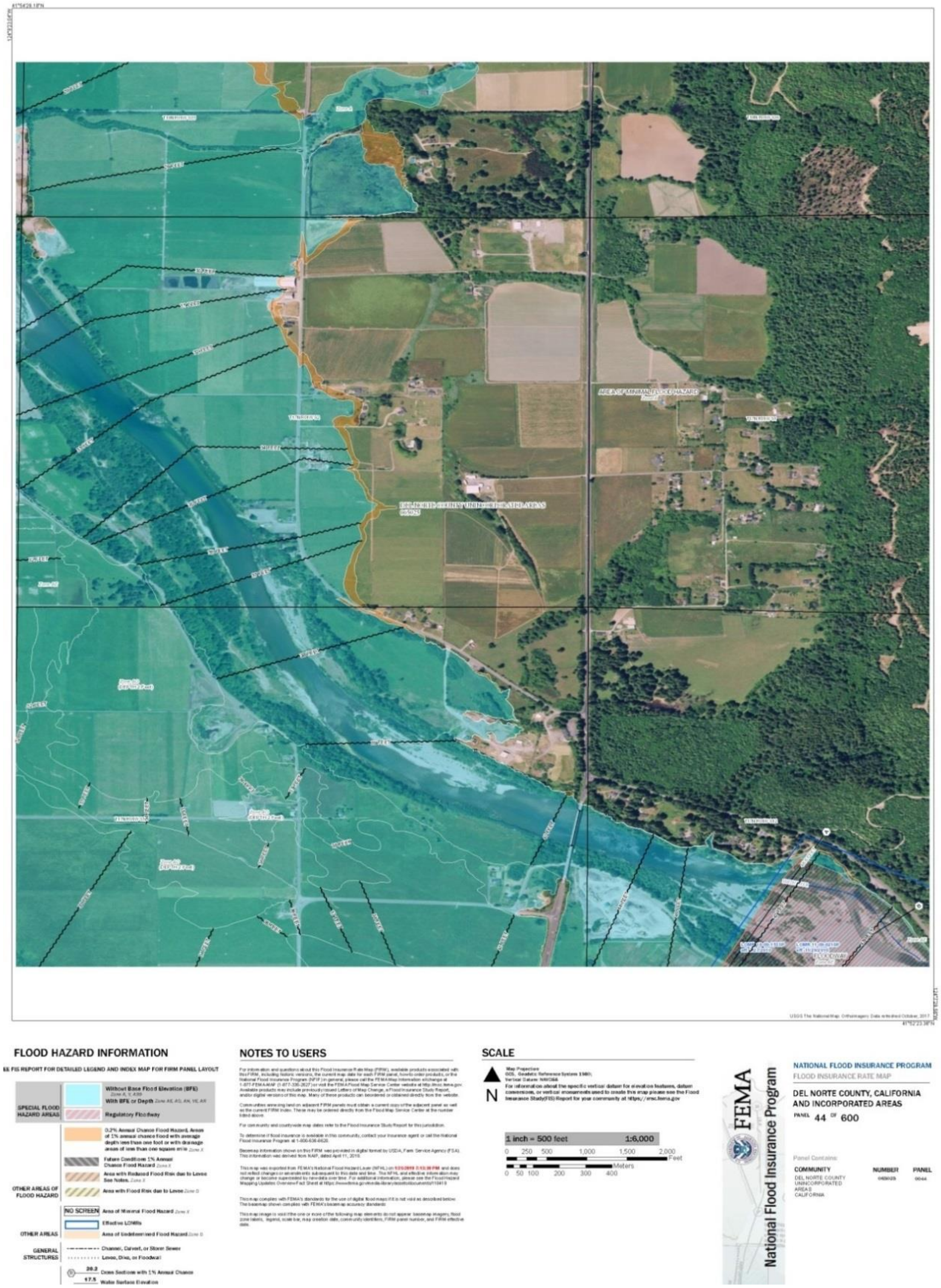


Figure 2-14. FEMA FIRM Map of Project Area

The output from the model simulations of existing conditions was compared to the model output of the various configurations of temporary construction features and the proposed build alternatives. Hydraulic parameters most likely to influence a change to river morphology (e.g., flow velocity, bed shear stress, and flow depth) were compared to evaluate the likelihood of change at the site.

2.2.1.3 Environmental Consequences

Build Alternatives

The Location Hydraulic Report concluded that all build alternatives meet hydraulic requirements and would not adversely affect the hydraulic capacity of the existing channel (floodplain). The proposed bridge will be designed not to become scour critical.

Under all alternatives, the proposed replacement bridge would have fewer piers in the river channel and floodplain than the existing bridge, and would have a minor effect on the hydraulic characteristics of the river (i.e., altered depth, velocity, and shear stress, thus equating to minor deposition). The change between existing and proposed permanent conditions is too small to lead to measurable long-term changes in the river channel or floodplain. Under all build alternatives, the project would not result in a significant floodplain encroachment, as defined by 23 CFR 650.105.

During construction, temporary in-water structures would affect channel hydraulics within the active river channel. These temporary structures would restrict or redirect the flow (typically just a local redirection), decreasing water depths and velocities at some locations and increasing water depths and velocities at others. Any changes to the river morphology resulting from temporary construction site conditions are expected to be naturally reconfigured during the first few high flow events after the proposed permanent bridge is in place, and would not cause long-term changes in river morphology. Caltrans has performed hydraulic modeling and scour analyses to evaluate potential short-term hydraulic and geomorphic effects of the temporary in-water structures under all build alternatives (Caltrans 2019m) and under both summer and winter conditions. These analyses predict localized changes in channel hydraulics, water velocities and shear stress.

During summer in-water construction (June 15 – October 15), temporary in-water structures such as construction trestles, gravel berms, falsework, and detour bridge foundations, would temporarily modify channel hydraulics. Under all build alternatives, construction areas in the Smith River would be accessed using temporary gravel berms during each in-water construction season. Although temporary gravel berm configurations would change each year depending on in-water construction activities, gravel berms would be placed across approximately 80 percent of the river cross-section during the summer seasons. Constriction of the flow resulting from gravel berms would result in increased flow velocities through the open channel spanned by temporary construction trestles. Under all build alternatives, hydraulic modeling of flow velocities under existing conditions and with the temporary gravel berm in place (based on two general configurations assumed for construction and demolition seasons) indicates that the maximum (5% exceedance values) water velocities in the narrowed channel under summer low flow conditions would increase from 0.6 feet per second under existing conditions to a range of 2.2 to 3.8 feet per second under summer low flow conditions, and from 2.7 feet per second under existing conditions to a range of 6.5 to 7.3 feet per second during summer high flow conditions (Caltrans 2019c). These conditions would temporarily increase shear stress from 0.014 to 0.16 pounds per square foot under existing conditions to 1.08 pounds per square foot under the worst-case configuration and potentially cause scour within the constricted channel. The worst-case shear stress resulting from constricted summer flows are similar to or below that experienced under normal winter flows (e.g., 0.8 to 1.3 pounds per square foot under 2-year and 10-year flows, respectively).

The construction approach for the superstructure under all build alternatives differs from the approach presented in the 2017 Initial Study/Environmental Assessment, which assumed falsework would remain in the river channel over winter. Under Alternatives 1 and 3, falsework to temporarily support the bridge superstructure construction would be installed at the beginning of the in-water construction season, would be in place until the bridge is cured, and is anticipated to come out before October 15. Under Alternative 2, temporary slicing towers erected to allow construction of the pre-cast girder superstructure are also anticipated to be removed by October 15.

During winter high flows, temporary construction features in the river channel include construction trestle piles; vertical trestle piles (24- or 30-inch steel shell piles or H-piles) would remain in the river year-round while the trestle deck and beams would be removed by October 15th each year. Also, under Alternative 3, temporary detour bridge foundations would remain in the river year-round. Localized scour at temporary bridge piers (Alternative 3 only) and at construction trestle piles (all alternatives) during peak winter flow events is expected to result in temporary, localized increases in suspended sediment and turbidity during the first series of major flow events. Although the total volume of fine sediment potentially mobilized in any given event is uncertain, the contribution of suspended sediment resulting from scour is expected to be small relative to the total sediment loads in the river during such events.

Hydraulic effects of the year-round trestle piles and detour bridge foundations include changes in flow patterns and potential for wood/debris racking and accumulation within the active river channel. The potential for large debris to be transported by the Smith River through the BSA mostly occurs in the winter and/or during high flow events. Temporary in-water structures could trap debris. Caltrans previously reviewed the debris loading history at Dr. Fine Bridge and the Hiouchi Bridge on SR 199 and found that debris accumulations have been minor (Caltrans 2016c). Nevertheless, as the largest undammed river system in California, the Smith River has the potential for large flow events in any year and resulting large woody debris carried downstream through the watershed.

During winter storms, large floating debris or “drift” could accumulate on in-water structures such as trestle piles and temporary detour foundations. Changes in flow patterns from in-water structures could affect likelihood of debris snagging on temporary piles or foundations.

Under Alternative 3A, temporary detour bridge foundations would be constructed immediately upstream of and in line with existing bridge piers. The temporary detour bridge piers would be spaced consistently with the existing bridge piers. Under Alternative 3B, the temporary bridge foundations would be spaced further apart than the existing bridge piers. The soffit elevation of the temporary detour bridge under either Alternative 3A (Jack and Slide) or Alternative 3B (Panel Bridge) would be at or higher than the soffit elevation of the existing bridge. The current bridge has a soffit elevation of 52 feet. The Alternative 3A Jack and Slide Detour would have a soffit elevation of 52 feet and the Alternative 3B Panel Bridge Detour would have a soffit elevation of 63.5 feet. As a result, available space for floating debris to pass under the temporary bridge would be greater than or the same as existing conditions. Therefore, the temporary bridge would provide adequate freeboard for large floating debris to pass under the bridge, and the temporary pier spacing would not constrict debris passage when compared to existing conditions. Therefore, the temporary bridge would not substantially change hydraulic conditions that would lead to significant debris loading.

As described in *Project Features, Standard Measures, and Best Management Practices,* Caltrans will require the contractor to prepare and implement a debris management plan. This plan would require the contractor to conduct regular inspections of the construction site as well as after major storm events to monitor debris loading and implement measures, as determined feasible, to remove debris that poses a threat to temporary and permanent infrastructure and channel/bank stability. Measures would include the use of onsite equipment (e.g., cranes) to dislodge or remove debris caught on project-related structures in the river, when site conditions allow the safe removal of debris. Debris removal would not occur under high flow conditions that pose safety risks.

The proposed permanent bridge under all build alternatives would have a lower potential to capture floating debris than the existing bridge due to fewer piers in the channel and longer spans between piers.

2.2.1.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.2.2 Water Quality and Storm Water Runoff

2.2.2.1 Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the federal Water Pollution Control Act making the addition of pollutants to the waters of the United States from any point source unlawful unless the discharge is in compliance with a NPDES permit. Known today as the Clean Water Act (CWA), Congress has amended it several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. Important CWA sections are:

- Sections 303 and 304 require states to promulgate water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity which may result in a discharge to waters of the U.S. 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 U.S. RWQCB administer this permitting program in California. Section 402(p) requires permits for discharges of storm water 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 the USACE.

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

The 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 in nature and cause minimal environmental effect. Nationwide permits are issued to authorize a variety of minor project activities with no more than minimal effects.

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 U.S. Environmental Protection Agency's Section 404 (b) (1) Guidelines (United States Environmental Protection Agency [U.S. EPA], CFR 40 Part 230), and whether permit approval is in the public interest. Section 404(b) (1) Guidelines were developed by the U.S. EPA, in conjunction with 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 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. 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 effluent standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b) (1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in Section 2.3.2, *Wetlands and Other Waters.*

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within 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. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it 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 Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA, and regulating discharges to ensure compliance with the water quality standards. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments in their jurisdictions, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants, which 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 the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the 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 SWRCB 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. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollution Discharge Elimination System Program

Municipal Separate Storm Sewer Systems

Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including MS4s. The U.S. EPA defines an MS4 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 storm water, that are designed or used for collecting or conveying storm water.” The SWRCB has identified Caltrans as an owner/operator of an MS4 pursuant to federal regulations. Caltrans’ MS4 permit covers all Caltrans rights of way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issue five-year NPDES permits, and permit requirements remain active until a new permit has been adopted.

Caltrans' MS4 Permit (Order No. 2012-0011-DWQ) was adopted September 19, 2012, and became effective 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 storm water and non-storm water discharges; and
3. Caltrans storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) BMPs, to the Maximum Extent Practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

To comply with the permit, Caltrans developed the statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within Caltrans for implementing storm water 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 storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project would be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

Construction General Permit

Construction General Permit, Order No. 2009-0009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012) regulates storm water discharges from construction sites which result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to the Construction General Permit if there is a potential for significant water quality impairment resulting from the activity—as determined by the RWQCB. Operators of regulated construction sites are required to develop

Storm Water Pollution Prevention Plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 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 soil erosion and transport to receiving waters. Requirements apply according to the Risk Level determined For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with Caltrans' SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one 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 401 Certification are CWA Section 404 permits issued by USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before USACE issues a 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.

2.2.2.2 Affected Environment

A Water Quality Assessment (WQA) for the Dr. Fine Bridge Replacement Project was completed in November 2015 (Caltrans 2015d). A revised WQA was prepared in 2017 to evaluate changes to the project description (Caltrans 2017a) and in 2019 to evaluate multiple alternatives (Caltrans 2019d). The project is within the Smith River Hydrologic Unit (HU) and is in the Smith River-Frontal Pacific Ocean watershed. The Smith River HU drains approximately 719 square miles, including the western Klamath Mountains and Northern Outer California Coast Ranges, west of the Siskiyou Mountains, just south of the Oregon border, and north of the Klamath River watershed. Surface waters within the project limits include the Smith River, one unnamed perennial stream located in the northwest quadrant, and one unnamed ephemeral drainage located in the southwest quadrant of the project area. Surface runoff in the project area drains to Smith River.

Flows at the project site in the Smith River vary from approximately 3,746 cubic feet per second (cfs), with an average monthly high of 8,432 cfs in January, and an average low of 336 cfs in September (Caltrans 2017a).

Top of Bank is defined as the surface water elevation at which the river overtops its banks and enters the floodplain (i.e., the 100-year floodplain). The USGS gaging station located adjacent to the existing Dr. Fine Bridge estimates the Top of Bank (TOB) elevation to be 33 feet (USGS 2015). Based on the CWA definition, 33 CFR 328.3(e) and 329.11(a)(1), the OHWM (2.5 year) is estimated to be at a surface water elevation of approximately 22 feet. The OHWM (2.5 year) elevation is the water surface elevation indicating bankfull discharge volume. Bankfull is the water level, or stage, a stream, river or lake reaches when the channel is full to the top of its banks. This is the most effective stream channel forming discharge which defines the active channel area (i.e., bankfull width x bankfull depth).

The RWQCB Basin Plan identifies municipal and domestic supply (MUN) as a beneficial use for the Smith River. The Basin Plan also identifies area groundwater as suitable or potentially suitable for MUN. There are private supply wells throughout the groundwater basin which are used for domestic, irrigation, and industrial purposes. No municipal or domestic water supply reservoirs or groundwater percolation facilities are within the project limits. No known groundwater management plans, groundwater ordinances, or basin adjudications exist for the Smith River Plain Groundwater Basin (DWR 2004). Drinking water is collected from the Smith River Plain Groundwater Basin and is managed by the City of Crescent City, Smith River Community Services District (CSD), Church Tree CSD, Bertsch-Oceanview CSD, Klamath CSD, and Roosevelt Water System.

Floodplain deposits underlie the Smith River floodplain and its tributaries. These deposits rest on basement rock. Floodplain deposits consisting of clay, sand, and gravel, with boulders and cobbles, are common. Floodplain deposits range in thickness from 40 to 95 feet. The deposits contain large amounts of unconfined water and are the most productive aquifers in the Smith River Plain. Yields range from approximately 200 to 800 gallons per minute (gpm), and hydraulic conductivity ranges from approximately 6,000 to 10,000 gallons per day (gpd) per square foot (DWR 1987).

River terrace deposits flank the Smith River floodplain and consist of silt, sand, and gravel with some clay. These deposits are considered moderately to highly permeable, with hydraulic conductivity ranging from 1,000 to 2,000 gpd per square foot, and range in thickness from 30 to 55 feet (DWR 1987). Recharge of the basin occurs through infiltration of precipitation and subsurface inflow from surface water and runoff in the lower reaches of the Smith River and other permeable stream channels. Groundwater level data show a seasonal fluctuation of approximately five to fifteen feet during normal and dry water years.

Storm water runoff within the project area discharges to the Smith River. Storm water accumulated on the existing bridge structure is currently discharged directly to the Smith River. Storm water from the surrounding land is discharged to the river by culverts, streams, and wetlands.

A risk assessment analysis, as required by the CGP, was conducted as part of the WQA to determine if each of the alternatives is a Risk Level 1, 2, or 3, based on potential erosion and transport of sediment to receiving waters. The Dr. Fine Bridge project's combined risk level is Level 3 (highest risk) for all build alternatives. The CGP requires all dischargers to conduct visual monitoring of non-storm, pre-storm, and post-storm conditions during construction. Because the proposed project has been evaluated as Risk Level 3, sampling and analysis of effluent discharges are required to characterize discharges associated with construction activity.

2.2.2.3 Environmental Consequences

Build Alternatives

Under all alternatives, potential impacts on water quality could occur during construction activities, including gravel berm and coffer dam construction and demolition, stream diversions, dewatering for pier construction, temporary trestle and falsework construction and demolition, bridge demolition, and highway drainage work.

Under Alternative 1 and 2the total DSA, including staging areas, would be approximately 29.9 acres, and the total impervious area would be increased by 0.77 acre. Under Alternative 3, the total DSA, including staging areas, would be approximately 27.5 acres, and the total impervious area would be increased by 0.35 acre. Under all alternatives, the existing roadway and bridge drainage systems would be replaced to provide improved interception and treatment of storm water discharges from the new bridge deck and roadway areas. Bioswales and/or biostrips would be installed in multiple locations to treat storm water discharges post-construction.

The existing bridge has scuppers (drain openings) that allow storm water to discharge directly into the Smith River. The new bridge drainage would consist of through deck drains, dropping the water straight down to the ground below the deck drain. Under all build alternatives the bridge would have a crest vertical curve to convey the water towards both the north and south banks of the river; thus the drains would discharge to the ground and not the river within ordinary high water.

Dewatering

Under all build alternatives, it is anticipated that the project would be required to implement a RWQCB-approved Construction Site Dewatering BMP Plan to manage construction dewatering operations and groundwater from excavations. The Construction Site Dewatering Plan would document and describe proposed non-storm water discharges and the types of BMPs that would be implemented to eliminate and/or minimize potential water quality impacts on receiving waters. Caltrans contract specifications would require the preparation of a dewatering discharge plan by the contractor, and then Caltrans and the RWQCB would approve. This plan would also be in conformance with the Caltrans Field Guide to Construction Site Dewatering (Caltrans 2014a).

Caltrans has identified an option for dewatering, which includes the construction of a temporary infiltration basin. The basin could be constructed by excavating to a depth of up to approximately 2.5 – 4.0 feet below the surface. The excavated material would be compacted around the perimeter of the basin and lined with geotextile fabric to prevent erosion. Excess fill material would be stockpiled with appropriate BMPs and used to restore the basin area to its original contour and grade. Uncontaminated accumulated water from excavations, piles, and cofferdams could be pumped directly into the basin for infiltration. Use of the basin may need to be adjusted due to soil saturation and soil permeability. Water that has potentially been in contact with concrete or other potential contaminants may be required to be pumped to tanks, tested, and treated (e.g., for pH) prior to being discharged to the infiltration basin.

Turbidity

Short-term increases in turbidity are likely to occur during the construction phase of the proposed project. Construction activities that disturb soil and sediments in stream channels, riparian zones, and floodplains can increase erosion and mobilization of sediments, resulting in increased turbidity and suspended sediment in streams. The total area of ground disturbance and vegetation clearing under Alternatives 1 and 2 is greater than for Alternative 3. However, the difference in disturbed area between the alternatives is minor, and the risk of increased sediment and turbidity from ground disturbance and vegetation clearing would be similar for all build alternatives. During construction, turbidity would be reduced by implementation of site-specific SWPPP and construction site BMP as required by the Provisions of the Caltrans Statewide Construction General Permit (Order 2009-0009-DWQ).

Groundwater

The project may also require use of the temporary infiltration basin(s) for the discharge of uncontaminated water generated during foundation construction, depending on the method chosen by the contractor. Water would be pumped from cofferdams and/or excavations to tanks. The water would then be tested, and treated, if required, prior to discharging to the basin, and/or being used for onsite dust control.

Base flows in rivers are the result of groundwater entering streams that cross many geologic strata. Dewatering operations at bridge piers in the Smith River channel could reduce the volume of water downstream of the project. However, it is anticipated that cofferdams and concrete seal-courses would minimize the volume of water required to be pumped out of the work area during foundation construction.

Anticipated Changes to the Biological Characteristics of the Aquatic Environment

Under all build alternatives, direct changes to the biological characteristics of the aquatic environment from project construction could result from work within, over, or adjacent to the river, including pile driving, structure removal/demolition, removal of riparian vegetation, and fill in the Smith River. Permanent revegetation of areas disturbed by the proposed project would be in accordance with erosion control plans prepared by a Caltrans District 1 Landscape Architect.

In order to maintain water quality and minimize the movement of soils and sediment into and within the river during proposed construction activities, effective erosion- and pollution-control measures would be implemented during construction. Construction BMPs described in the SWPPP would be implemented to protect the watercourse during construction activities, and post-construction storm water treatment BMPs would maintain site hydrology and reduce the runoff of pollutants relative to existing conditions. The project SWPPP and site design would provide appropriate BMPs to appropriately stabilize DSA and bare soil areas over both the short-term and long-term, as well as minimize adverse effects on water quality, aquatic habitat (including wetlands), and listed species. Anticipated BMPs may include soil stabilization practices, preserving existing vegetation, and weather-appropriate scheduling of specific construction operations (e.g., excavation, concrete pours). With implementation of the BMPs, the potential for modifying biological characteristics of the aquatic environment would not be substantial.

After construction is complete and disturbed soils have stabilized, the drainage design features and storm water treatment BMPs would not be expected to increase storm water runoff volumes to the Smith River, and would be expected to improve the quality of storm water discharged from the project area. Culverts, ditches, and dikes and other storm water runoff conveyance structures constructed, or modified, as part of this project would overall maintain the existing natural drainage patterns.

Additional information about impacts on biological resources is further described in Section 2.3, *Biological Environment.*

2.2.2.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.2.3 Geology/Soils/Seismic/Topography

2.2.3.1 Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under CEQA.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans' Office of Earthquake Engineering is responsible for assessing the seismic hazard for Caltrans projects. Structures are designed using the Caltrans' Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, refer to the Caltrans' Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria (http://www.dot.ca.gov/hq/esc/earthquake_engineering/sdc/).

2.2.3.2 Affected Environment

Descriptions of existing conditions at the site are derived from analysis completed by the Caltrans' Division of Engineering Services, Geotechnical Services, Office of Geotechnical Design-North, as summarized in the project's Preliminary Geotechnical Report (2005), Structures Preliminary Geotechnical and Preliminary Seismic Report (2008c), and Preliminary Foundation Report for New Smith River (Dr. Fine) Bridge (2014e). There are no National Natural Landmarks in or near the project area.

Topography

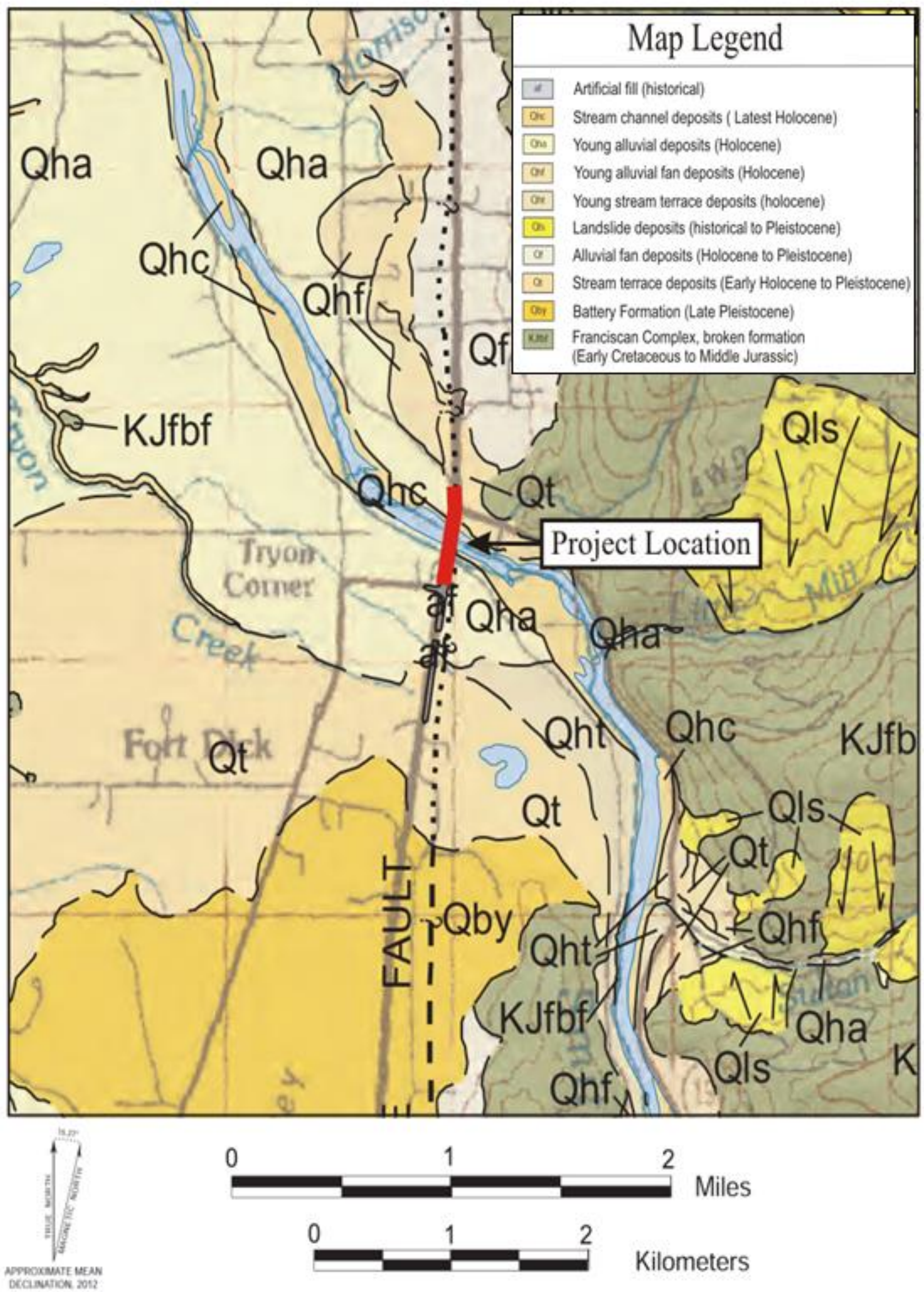
The project site is in the extreme northwestern corner of California where the Smith River crosses the Smith River Plain. The plain lies at the western margin of the Coast Ranges Geomorphic Province of California and is bounded to the north, east and south by Mesozoic Franciscan Formation (California Groundwater Bulletin 118) and to the west by the Pacific Ocean. The roadway surface elevation is approximately 62 feet at the intersection of Lake Earl Drive on the south bank and approximately 66 feet at the intersection of SR 197 on the north bank.

The ground surface rises from an elevation of approximately 12 feet on the river bed to an elevation of approximately 38 feet on the south bank and approximately 44 feet on the north bank.

The Smith River flows west/northwest beneath the bridge. Storm water drains from the roadway surface and is conveyed to the adjacent fields via corrugated steel pipe down drains. The south approach to the existing bridge is constructed on a raised embankment beginning at the north end of the Smith River Overflow Bridge. There is a short section of raised embankment from the north end of the existing bridge that continues to the nearby intersection with SR 197. Low cut slopes exist from the end of the embankment to Fred D. Haight Drive.

Geology

The preserved geologic history in the project vicinity ranges from Mesozoic to Holocene. For the purposes of the report, geologic units were categorized, from oldest to youngest, as Late Jurassic to Early Cretaceous sedimentary rocks belonging to the Franciscan Complex, Quaternary stream terrace deposits, and Holocene fluvial and alluvial deposits (Figure 2-15, Table 2-4). The Franciscan Formation forms the bedrock and surrounding uplands in the project area.



(modified from Delattre and Rosinski (2012); scale approximately 1:75,000)

Figure 2-15. Geologic Map of the Project Area

Table 2-4. Geologic Units in the Project Area

Age	Geologic Unit	Lithology
Holocene	Quaternary alluvium and fluvium	Unconsolidated or poorly consolidated gravels and cobbles with minor silt, sand, and clay
Pleistocene to early Holocene	Quaternary Stream terrace deposits	Moderately consolidated gravels, cobbles, and clay with minor silt and sand
Mesozoic	Franciscan Complex	Graywackes interbedded with shales, sandstones, and conglomerates

Geologic maps were reviewed to determine the stratigraphic units that might be affected by project-related excavations. During the field survey for the project, the geologic maps were ground-truthed and determined to be reasonably accurate, given the limited exposures and abundant vegetation cover. Stratigraphy was observed in natural exposures, such as beach cliffs and stream banks, and artificial exposures, such as road cuts.

Seismic Considerations

According to the online Alquist-Priolo Earthquake Fault Zoning Act, the project area is not located within an Alquist-Priolo Earthquake Fault Zone. There is a concealed fault known as the Del Norte Fault, shown on Figure 2-15, running north-south near the bridge. However, the existence of this fault is considered controversial, and if it does exist, it is not considered active (Caltrans 2008c). The nearest active fault is the Big Lagoon-Bald Mountain with a maximum magnitude of 7.5, located approximately 17 miles west of the project. This fault is a reverse fault with a dip angle of 35 degrees to the northeast (dipping toward the proposed bridge site). The minimum distance from the proposed bridge site to the fault rupture plane is approximately 10 miles.

Soils

There are nine NRCS soil map units mapped in the project area (Table 2-5 and Figure 2-16) (NRCS 2019). Several characteristics of soils determine sensitivity to soil erosion. Slope steepness is an important factor, with soil erosion more likely on steeper slopes. Soil permeability, infiltration rates, and runoff rates, which are a function of slope steepness, soil parent material, and depth of A-horizon, also have a large influence on soil erosion susceptibility. Soils in the project area are typically on relatively shallow slopes, with alluvium derived soils that are relatively deep and typically well drained or moderately well-drained. Soil landforms include floodplains and alluvial terraces.

Table 2-5. Soil Map Units in the Project Area

Map Unit	Map Unit Name	Slopes	Parent Material	Landscape Setting	Drainage Class	Dominant Soil Textures
100	Water and fluvents	0-2%	Alluvium	River channels	Somewhat excessively drained	Gravelly sandy loam
130	Fluvaquents-Typic Udifluvents complex	0-2%	Alluvium	Stream channels	Poorly drained	Silty clay loam
172	Bigriver	2-5%	Alluvium	Floodplains	Well-drained	loamy sand
178	Battery	15-50%	Alluvium	Stream terraces	Well-drained	Gravelly clay loam
196	Madriver	0-2%	Alluvium	Natural levees	Moderately well-drained	Loam
201	Grizzlybluff	0-2%	Alluvium	Floodplains	Well-drained	Loam
255	Carlotta	0-2%	Alluvium	Terraces	Moderately well-drained	Loam
261	Tillas	2-9%	Alluvium	Alluvial fans	Well-drained	Gravelly clay loam
395	Pits and Udifluvents	0-15%	Alluvium	Stream terraces and floodplains	Well-drained	Silt loam

Scour Considerations

The existing bridge is in a scour critical condition. There is a long history of gravel mining both upstream and downstream of the bridge site, with the overall degradation (lowering of the stream bed) rate at the site estimated to be approximately one foot/ten years. The bridge was determined scour critical due to this degradation rate, combined with channel migration and hydraulic skew, unpredictable and rapid fluctuation in vertical stability due to gravel mining, and potential seismic instability.

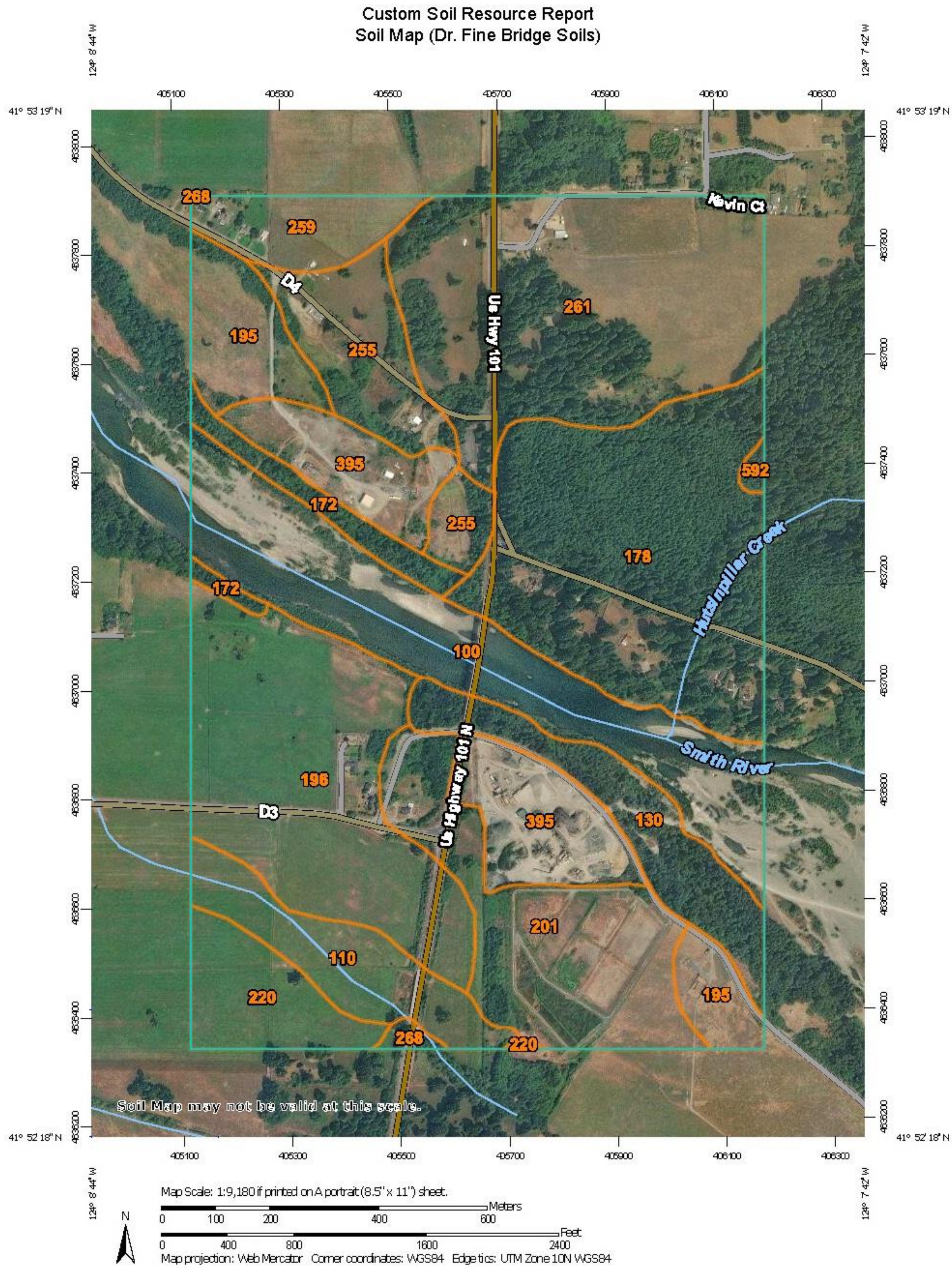


Figure 2-16. NRCS Soil Map Units in the Project Area.

2.2.3.3 Environmental Consequences

Build Alternatives

Caltrans collected extensive subsurface geotechnical data, evaluated the potential for conditions under seismic events, and designed the bridge under all build alternatives to meet all seismic design criteria. Therefore, it is unlikely that the proposed project would expose people or structures to potential substantial adverse effects from the rupture of a known earthquake fault.

Soil liquefaction occurs when loose, water-saturated soils lose shear strength in response to the sudden shaking from an earthquake and begin behaving like a liquid, reducing their ability to support embankments and structures. At the project site, the subsurface soils below the water table predominantly consist of well-graded sands, gravels, cobbles and rock, which are not typically prone to liquefaction. Therefore, the potential for liquefaction at the project site is considered minimal. The potential for surface rupture at the project site due to fault movement is considered minimal as there are no known active faults projecting towards or passing directly through the project site.

Potential movement of soils and sediment resulting from the build alternatives, as well as erosion-control measures and BMPs to stabilize soils, are described under Section 2.2.2, *Water Quality and Storm Water Runoff*. This includes implementation of site-specific SWPPP and construction site BMP as required by the Provisions of the Caltrans Statewide Construction General Permit (Order 2009-0009-DWQ). Potential scour effects under the build alternatives are discussed under Section 2.2.1, *Hydrology and Floodplain.*

2.2.3.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no new impact would occur and scour conditions at the bridge would worsen over time.

2.2.4 Paleontology

2.2.4.1 Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

23 USC 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law.

Under California law, paleontological resources are protected by CEQA. U.S. Code, Title 23, Section 1.9(a) requires that the use of Federal-aid funds must be in conformity with all federal and state laws, therefore, paleontological resources must be addressed to retain federal funds.

The Del Norte County General Plan Goal 5.H and Policy 5.H.2 include provisions to encourage identification and protection of important paleontological sites.

2.2.4.2 Affected Environment

A Paleontological Identification/Evaluation Report and associated addendums were prepared for the project in 2017 (Caltrans 2017b, 2017c, 2019p) to evaluate the potential for paleontological resources within the project area. The work performed for the report and addendum conforms to Society of Vertebrate Paleontology (SVP) standard procedures, which outline acceptable professional practices in the conduct of paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 2010).

Table 2-6 presents a summary of the geologic units that may potentially be affected by project excavations and their respective paleontological sensitivities.

Table 2-6. Paleontological Potential of Geological Units Found in the Project Area

Age	Geologic Unit	Lithology	Known Paleontological Resources	Paleontological Potential
Holocene	Stream channel alluvium and fluvium deposits	Unconsolidated or poorly consolidated gravels and cobbles with minor silt, sand	No significant resources defined by the Caltrans SER and SVP	Low
Pleistocene to early Holocene	Stream terrace fluvial deposits	Moderately consolidated gravels, cobbles, and clay with minor silt and sand	No significant resources defined by the Caltrans SER and the SVP	Low
Mesozoic	Franciscan Complex	Graywacke, interbedded with shales, sandstones, and conglomerates; metamorphic alteration	No significant resources defined by the Caltrans SER and SVP	Low

The project area is underlain by Quaternary/Holocene surficial sediments with low paleontological potential, consisting of alluvial (deposited by a stream) and fluvial (within an active stream) deposits. Below these deposits is the Cretaceous/Jurassic Franciscan Complex, Broken formation, which has been identified as low potential for paleontological resources.

A search of the University of California Museum of Paleontology (UCMP), California Academy of Sciences Institute for Biodiversity Science and Sustainability Fossil Collection Database, Paleobiology Database and Fossilworks online databases confirmed that, to date, there are no known fossil localities within the Quaternary stream/alluvial deposits or Franciscan Complex in Del Norte County in which the proposed project is located.

2.2.4.3 Environmental Consequences

Build Alternatives

Project activities for the build alternatives would include ground disturbance during slope, abutment, and pedestrian walkway excavations; grading at equipment staging areas and for an infiltration basin; construction of coffer dams; auguring for new piers; and pile driving for abutment support. Construction activities evaluated for potential impacts to paleontological resources are excavation and pier augering and pile driving. The proposed grading would be within portions of previous disturbed and imported soils from the original bridge construction and native deposits consisting of sands and gravels of fluvial and alluvial origin. The extent and intensity of the proposed ground disturbance activity in the low paleontological potential native alluvial deposits would be localized and limited to utility relocation, roadway, infiltration basin, drainage, and coffer dam excavations, and pile and pier removal and installation. The depth to the Broken formation bedrock recorded in the Log of Test Borings indicates bedrock depth ranges from 13.5 feet to 121.5 feet below existing grade. Driven H piles or Cast in Steel Shell pile installation would not generate spoils conducive to paleontological information gathering. In addition, piles installed by cast-in-drilled-hole would likely significantly alter sediments and bedrock, not allowing useful collection of paleontological information from these construction activities.

Based on the geologic and paleontological information available and proposed project activities, scientifically significant fossils in these formations in the project area are unlikely to be encountered.

Although potential impacts would be minimal, Caltrans has included standard measures (see Section 1.7.17) as part of the project description to implement emergency discovery procedures if paleontological resources are encountered.

2.2.4.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are proposed. .

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.2.5 Hazardous Waste/Materials

2.2.5.1 Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, and the Resource Conservation and Recovery Act (RCRA) of 1976 (RCRA). The purpose of CERCLA, often referred to as “Superfund,” is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for “cradle to grave” regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, EO 12088, Federal Compliance with Pollution Control Standards, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter- Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

2.2.5.2 Affected Environment

Technical memos and reports prepared for the project include:

- Initial Site Assessment Memos 2001, 2004, and 2008
- Preliminary Site Investigation Report (prepared by Geocon Consultants, Inc.), 2009
- Preliminary Site Investigation Report (prepared by Geocon Consultants, Inc.), 2010
- Asbestos-Containing Materials and Lead-Containing Paint Survey (prepared by Geocon Consultants, Inc.), 2010
- Transmittal of Preliminary Site Investigation and Asbestos and Lead-Containing Paint Survey Reports and Summary of Hazardous Waste Issues Memo, 2012
- Updated Initial Site Assessment Memo, 2014
- Initial Site Assessment (for dewatering area) Memo, 2015
- Updated Initial Site Assessment (for multiple alternatives, Caltrans 2019e)

The Initial Site Assessments (ISAs) conducted for the general project area in 2001, 2004, and 2008 identified numerous potential issues that needed evaluation. These issues included petroleum contaminated properties adjacent to the project site, releases of aerially deposited lead from vehicle exhaust, lead containing paint, asbestos containing material on the bridge structure, and river gravels containing restricted levels of naturally occurring asbestos (NOA). Also identified were nominal “hazardous waste” issues related to Treated Wood

Waste and lead in thermoplastic stripe which can be handled with existing Caltrans Standard Specifications.

The ISA identified two sites near the bridge as having past petroleum hydrocarbon contamination issues. One site is on the southwest corner of the approximately 5-acre parcel (APN 105-700-01) at the southwest quadrant of the project site (see Figure 2-1 in Section 2.1.1, *Land Use*), where Melody Market was formerly located. The other site is a property owned by Eagle, Cap Rentals (APN 105-260-14 and APN 105-020-20) on the southeast quadrant of the project site. Both sites are considered to be on the Hazardous Waste and Substances Site List (Cortese List). Both of these parcels also have "Case Closed" status from the RWQCB, which means they have fulfilled their obligations to mitigate for any releases that have occurred. These sites, or adjacent areas within the project, were evaluated during Preliminary Site Investigations (PSIs) and found that contamination issues that occurred on these parcels do not affect the proposed project.

The ISA identified the need for Asbestos-Containing Materials and Lead-Containing Paint Surveys. These surveys were conducted on the bridge and other structures that could be demolished as part of the project to comply with National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations. No materials were identified in the structures surveyed that required lead abatement or asbestos removal prior to bridge demolition.

To evaluate potential impacts due to aerially deposited lead (ADL) from the historical use of leaded gasoline in the surface and near-surface soils within the project boundaries, a PSI was conducted. The PSI found lead present in soils throughout the project area, but overall levels were low. ADL is typically concentrated in the top two feet of soil adjacent to the highway. Based on the soil sampling conducted, statistical evaluation of the data suggests that if the top two feet of embankment soil on the project were excavated, it could be reused on site without restriction or provided to the contractor for disposal, in accordance with the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control. This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met. The nominal ADL issue identified would be handled with the inclusion of a Lead Compliance Plan contract item and Caltrans Standard Special Provisions.

NOA was determined to be present in alluvium throughout the site. The identified levels are low; however, a dust control plan and asbestos compliance plan would be prepared.

The temporary construction easement property proposed for dewatering and staging (APN 105-020-14) was later reviewed by Caltrans in an updated ISA, which found that these sites are not on the Cortese List.

2.2.5.3 Environmental Consequences

Build Alternatives

Small amounts of lead present throughout the soils in the project area would be disturbed during construction activities involving ground disturbance. Under all alternatives, lead in the traffic striping would be disturbed when the final alignment is constructed and lead in the paint on the bridge may be disturbed during bridge demolition. Additionally, under Alternative 3A, lead in the traffic striping would be disturbed when the temporary detour is constructed and lead in the paint on the bridge may be disturbed during the Jack and Slide process.

Under all alternatives, treated Wood Waste and lead in thermoplastic stripe would be handled with existing Caltrans Standard Special Provisions, which require preparation of a Lead Compliance Plan to address the lead in the striping and/or soil.

Asbestos Containing Materials were not discovered in any samples analyzed but was assumed present in slab expansion joints. Under all alternatives, the joints would be properly handled and contained during bridge removal. Under Alternative 3A, these joints would also be exposed when the detour bridge is removed.

NOA is present in soils in the project area due to the underlying geology; serpentine rocks present within the Smith River Watershed. As these soils would be disturbed throughout project construction, an asbestos compliance and dust control plan would be required for all build alternatives.

A small portion of the previously contaminated parcel southwest of the bridge (former Melody Market parcel) is proposed to be acquired under Alternatives 1 and 2, and a temporary construction easement would be needed for staging on this parcel under all build alternatives. There would be minor soil disturbance at this location under the build alternatives, as work consists of adding aggregate to the surface of the site for machinery and vehicles to drive over. Investigations found no remaining petroleum hydrocarbon impacts and the site has been cleared by the RWQCB. Therefore, no release of hazardous waste/materials is anticipated at this parcel.

2.2.5.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur

2.2.6 Air Quality

2.2.6.1 Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. EPA and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (Pb) and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA. In addition to this environmental analysis, a parallel "Conformity" requirement under the FCAA also applies.

Conformity

The conformity requirement is based on FCAA Section 176(c), which prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs or projects that do not conform to the State Implementation Plan (SIP) for attainting the NAAQS. "Transportation Conformity" applies to highway and transit projects and takes place on two levels: the regional (or planning and programming level) and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. The U.S. EPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O_3, $PM_{10,}$ and $PM_{2.5}$, and in some areas (although not in California), SO_2. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO_2, and also has a nonattainment area for Pb; however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA) make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and used the latest planning assumptions and U.S. EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

2.2.6.2 Affected Environment

An Air Quality Memo was prepared in October 2011 and an additional updated Air Quality Analysis Memo was prepared in May 2014. Additional review was completed in 2017 and

2019 (Caltrans 2019f) due to changes to the alternatives and to ensure the memos remained valid.

The project is in the Del Norte County, which is situated in the North Coast Air Basin. The North Coast Air Basin is characterized by a cool maritime climate with a seasonal distribution of precipitation. The average annual rainfall for the project area is 71.26-inches. Most rain falls from October through April, accounting for 90 percent of the annual precipitation. The dry season, May through September, is typically marked by intrusions of low clouds and fog and sunny afternoons. Average daily high and low temperatures in January are 54 and 40°F and in August are 66 and 51°F, respectively.

Under NAAQS, Del Norte County is classified as in attainment for all transportation related criteria pollutants (CO, Ozone, $PM_{2.5}$, PM_{10}). Under California Ambient Air Quality Standards, the county is classified as in attainment for the ozone, $PM_{2.5}$, and PM_{10} standard, and unclassified for CO. Table 2-7 lists the state and federal air pollutant standards and Del Norte County's attainment status for each. Because Del Norte County attains all NAAQS, there are no applicable SIPs.

Table 2-8 lists air quality trends in data collected at North Coast Air Basin for the past 5 years. Figure 2-17 shows the air quality monitoring stations (blue squares) located in the North Coast Air Basin (red boundary). Table 2-8 summarizes existing air quality conditions in North Coast Air Basin including the proposed project area, since the data of criteria pollutants are not available in the Crescent City-Crescent Elk School air monitoring station (ARB 08659, 994 G Street, Crescent City, CA) near the project location in Del Norte County. It includes attainment statuses for criteria pollutants and describes local ambient concentrations of criteria pollutants for the past 5 years from 2014 to 2018.

Table 2-7. State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State[1] Standard	Federal[2] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status[3]	Federal Project Area Attainment Status[3]
Ozone (O_3)[4]	1 hour	0.09 ppm[5]	none	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.	Attainment	N/A
Ozone (O_3)[4]	8 hours	0.070 ppm	0.070 ppm (4th highest in 3 years)	(see above)	(see above)	Attainment	Unclassified/ Attainment
Carbon Monoxide (CO)[6]	1 hour	20 ppm	35 ppm	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone. Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	Unclassified	Unclassified/ Attainment

Pollutant	Averaging Time	State[1] Standard	Federal[2] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status[3]	Federal Project Area Attainment Status[3]
Carbon Monoxide (CO)[6]	8 hours	9.0 ppm	9 ppm	(see above)	(see above)	Unclassified	Unclassified/ Attainment
Carbon Monoxide (CO)[6]	8 hours (Lake Tahoe)	6 ppm	none	(see above)	(see above)	Unclassified	N/A
Respirable Particulate Matter (PM_{10})	24 hours	50 $\mu g/m^3$ [8]	150 $\mu g/m^3$ (expected number of days above standard < or equal to 1)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic & other aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.	Attainment	Unclassified
Respirable Particulate Matter (PM_{10})	Annual	20 $\mu g/m^3$	none	(see above)	(see above)	Attainment	N/A

Pollutant	Averaging Time	State[1] Standard	Federal[2] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status[3]	Federal Project Area Attainment Status[3]
Fine Particulate Matter ($PM_{2.5}$)[7]	24 hours	N/A	35 µg/m[3] [9]	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic & other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	Attainment	Unclassified
Fine Particulate Matter ($PM_{2.5}$)[7]	Annual	12 µg/m^3	12.0 µg/m^3	(see above)	(see above)	Attainment	N/A
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm[10]	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of stormwater. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.	Attainment	Unclassified/ Attainment
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm	0.053 ppm	(see above)	(see above)	Attainment	Unclassified/ Attainment

Pollutant	Averaging Time	State[1] Standard	Federal[2] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status[3]	Federal Project Area Attainment Status[3]
Sulfur Dioxide (SO_2)[11]	1 hour`	0.25 ppm	0.075 ppm (99th percentile over 3 years)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Unclassified/ Attainment	Unclassified/ Attainment
Sulfur Dioxide (SO_2)[11]	3 hours	none	0.5 ppm[11]	(see above)	(see above)	N/A	Unclassified/ Attainment
Sulfur Dioxide (SO_2)[11]	24 hours	0.04 ppm	0.14 ppm (for certain areas)	(see above)	(see above)	Unclassified / Attainment	Unclassified/ Attainment
Sulfur Dioxide (SO_2)[11]	Annual	none	0.030 ppm (for certain areas)	(see above)	(see above)	N/A	Unclassified/ Attainment
Lead (Pb)[13]	Monthly	1.5 µg/m^3	none	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.	Attainment	N/A
Lead (Pb)[13]	Calendar Quarter	none	1.5 µg/m^3 (for certain areas)	(see above)	(see above)	N/A	Unclassified/ Attainment

Pollutant	Averaging Time	State[1] Standard	Federal[2] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status[3]	Federal Project Area Attainment Status[3]
Lead (Pb)[13]	Rolling 3-month average	none	0.15 µg/m^3	(see above)	(see above)	N/A	Unclassified/ Attainment
Sulfates	24 hours	25 µg/m^3	none	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	Attainment	N/A
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	none	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	Unclassified	N/A
Visibility Reducing Particles (VRP)[14]	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	none	Reduces visibility. Produces haze. Note: not directly related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.	Unclassified	N/A
Vinyl Chloride[1]	24 hours	0.01 ppm	none	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	N/A	N/A

Adapted from the California ARB Air Quality Standards chart.
Greenhouse Gases and Climate Change: Greenhouse gases do not have concentration standards for that purpose. Conformity requirements do not apply to greenhouse gases.
[1] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations
[2] Federal standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S.EPA for further clarification and current national policies.
[3] Attainment status from California Air Resources Control Board 2018.
[4] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm. Transportation conformity applies in newly designated nonattainment areas for the 2015 national 8-hour ozone primary and secondary standards on and after August 4th, 2019 (see Transportation Conformity Guidance for 2015 Ozone NAAQS Nonattainment Areas).
[5] ppm = parts per million
[6] Transportation conformity requirements for CO no longer apply after June 1, 2018 for the following California Carbon Monoxide Maintenance Areas (see U.S. EPA CO Maintenance Letter).
[7] On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m3 to 12 µg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
[8] $\mu g/m^3$ = micrograms per cubic meter
[9] The 65 $\mu g/m^3$ $PM_{2.5}$ (24-hr) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. The 15 $\mu g/m^3$ annual $PM_{2.5}$ standard was not revoked when the 12 $\mu g/m^3$ standard was promulgated in 2012. Therefore, for areas designated nonattainment or nonattainment/maintenance for the 1997 and or 2006 $PM_{2.5}$ NAAQS, conformity requirements still apply until the NAAQS are fully revoked.
[10] Final 1-hour NO_2 NAAQS published in the Federal Register on 2/9/2010, effective 3/9/2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause re-designation to nonattainment in some areas after 2016.
[11]On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.
[12] Secondary standard, the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.
[13] In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.
[14] Lead NAAQS are not considered in Transportation Conformity analysis.

Table 2-8. Air Quality Concentrations for the Past 5 Years Measured at North Coast Air Basin.

Pollutant	Standard	2014	2015	2016	2017	2018
Ozone						
Max 1-hr concentration		0.060	0.054	0.047	0.063	0.045
No. days exceeded: State	0.09 ppm	0	0	0	0	0
Highest 8-hr concentration: State		0.064	0.064	0.066	0.084	0.061
Federal		0.064	0.063	0.066	0.084	0.061
No. days exceeded: State	0.070 ppm	0	0	0	1	0
Federal	0.070 ppm	0	0	0	1	0
PM_{10}						
Highest 24-hr concentration: State		45.6	57.6	45.0	168.0	278.6
Federal		104.7	58.1	53.6	164.7	259.1
No. days exceeded: State	50 µg/m^3	0	2	0	7	13
Federal	150 µg/m^3	0	0	0	1	2
Annual average concentration: State		14.4	17.3	9.7	17.4	19.3
Federal		18.1	18.0	16.1	17.4	18.6
No. days exceeded: State	20 µg/m^3	*	*	*	*	*
$PM_{2.5}$						
Max 24-hr concentration: Sate		81.5	303.2	33.6	498.0	263.2
Federal		33.0	73.4	20.0	127.3	263.2
No. days exceeded: Federal	35 µg/m^3	0	4	0	8	20
Max annual concentration: State		7.4	7.9	6.4	9.4	11.3
Federal		5.4	8.5	6.4	9.4	11.3
No. days exceeded: State	12 µg/m^3	*	*	*	*	*
Federal	12.0 µg/m^3	*	*	*	*	*
Nitrogen Dioxide						
Max 1-hr concentration; State		35.0	25.0	48.0	22.0	58.0
Federal		35.1	25.5	48.4	22.4	58.1
No. days exceeded: State	180 ppb	0	0	0	0	0
Federal	100 ppb	0	0	0	0	0
Max annual concentration: State		2.0	*	2.0	2.0	2.0
Federal		*	*	*	*	*
No. days exceeded: State	30 ppb	*	*	*	*	*
Federal	53 ppb	*	*	*	*	*

*There was insufficient (or no) data available to determine the value.

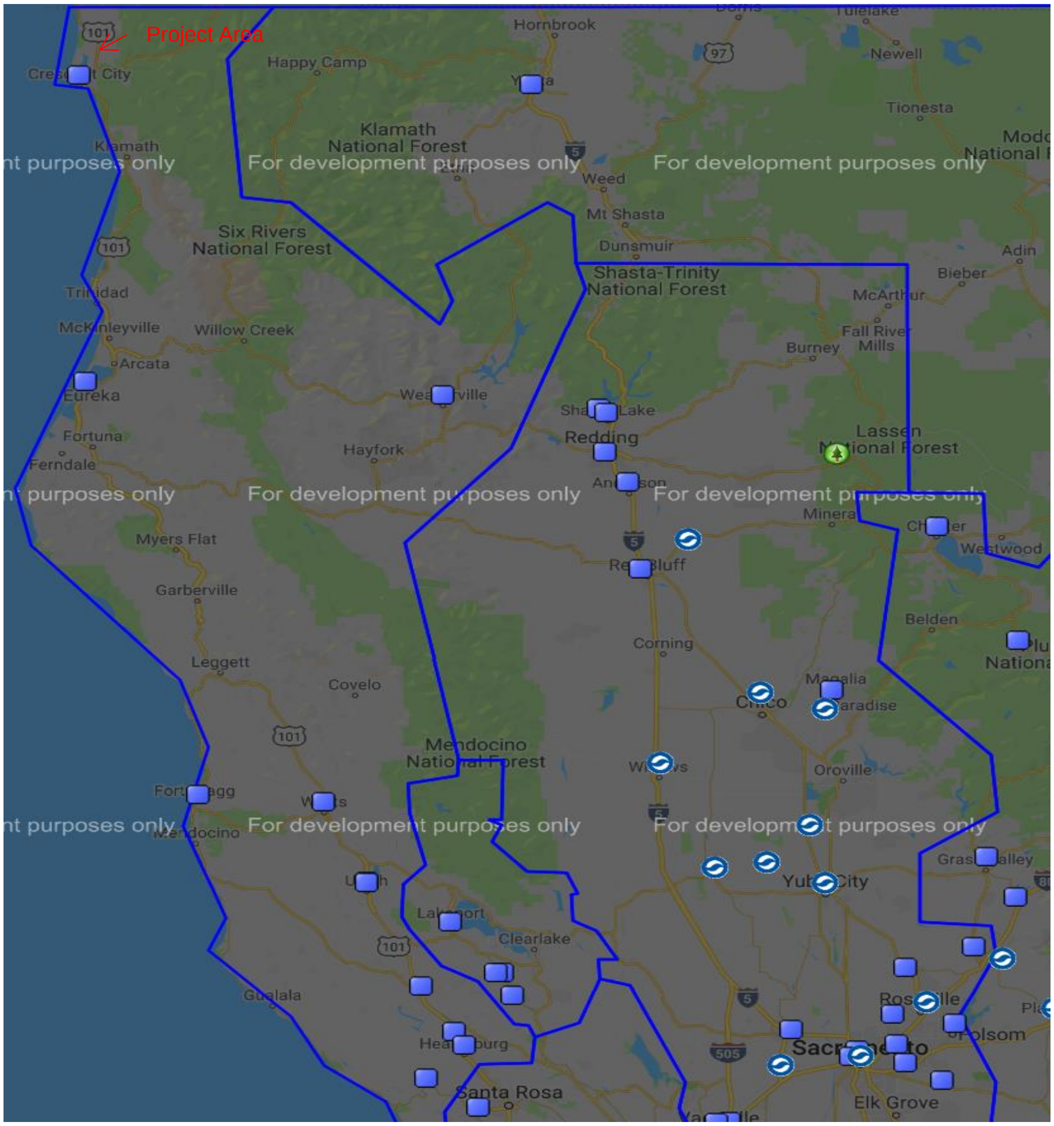


Figure 2-17. Locations of Air Quality Monitoring Stations in North Coast Air Basin

2.2.6.3 Environmental Consequences

Build Alternatives

Transportation Conformity

The project is in an attainment/unclassified area for all current NAAQS. The project is also exempt from all air quality conformity analysis requirements per Table 2 of 40 CFR 93.126, subsection Safety (Widening narrow pavements or reconstructing bridges [no additional travel lanes]). Therefore, transportation conformity requirements do not apply and are not discussed further.

Long-Term Operational Emissions

This project would not change traffic volume, fleet mix, speed, or any other factor that would cause an increase in emissions relative to the No-Build Alternative; therefore, this project would not cause an increase in operational criteria pollutant emissions or mobile source air toxics. Improved non-motorized access may have a beneficial impact to long-term operational emissions.

Short-Term Construction Emissions

Under all build alternatives, the project may result in the generation of short-term construction-related air emissions, including the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities. Emissions from construction equipment also are expected and would include CO, nitrogen oxides (NO_X), volatile organic compounds (VOCs), directly-emitted particulate matter (PM10 and PM2.5), and toxic air contaminants such as diesel exhaust particulate matter. Construction activities are expected to increase traffic congestion in the area, resulting in increases in emissions from traffic during the delays. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Fugitive dust would be generated during grading and construction operations. Sources of fugitive dust include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site may deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM10 emissions may vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM10 emissions depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Both fugitive dust and construction equipment exhaust emissions would be temporary and transitory in nature. Caltrans Standard Specifications, a required part of all construction contracts, should effectively reduce and control emission impacts during construction. The provisions of Section 14-9.02 Air Pollution Control and Section 14-9.03 Dust Control require the contractor to comply with all pertinent rules, regulations, ordinances, and statutes of the local air district.

Construction activities would not last for more than five years at one general location, so construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

Asbestos and Lead (Pb)

Naturally occurring asbestos is known to exist in serpentine, a greenish greasy-looking rock, found within the ultramafic rock. Based on the California Geologic Survey and National Resource Conservation Service soils map, ultramafic rocks are found in the northern and central area of Del Norte County. Additionally, as discussed in Section 2.2.5, *Hazardous Waste/Materials*, there is potential for asbestos-containing materials in slab expansion joints. Rules and regulations of the local air quality management districts must be adhered to when handling this material as discussed in the *Hazardous Waste/Materials* section above.

Pb is normally not an air quality issue for transportation projects unless the project involves disturbance of soils containing high levels of aerially deposited Pb, or painting or modification of structures with Pb-based coatings. There are no industrial lead sources within the immediate vicinity of the project.

2.2.6.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.2.6.5 Climate Change

Climate change is analyzed in Section 3.2, *Climate Change*. Neither the U.S. EPA nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the CEQA chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the project.

2.2.7 Noise and Vibration

2.2.7.1 Regulatory Setting

NEPA and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the NEPA/23 CFR 772 noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with FHWA involvement (and Caltrans, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table (Table 2-9) lists the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

Figure 2-18 lists the noise levels of common activities to enable readers to compare the actual and predicted noise levels discussed in this section with common activities.

According to the Caltrans' Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Table 2-9. Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

[1] Includes undeveloped lands permitted for this activity category.

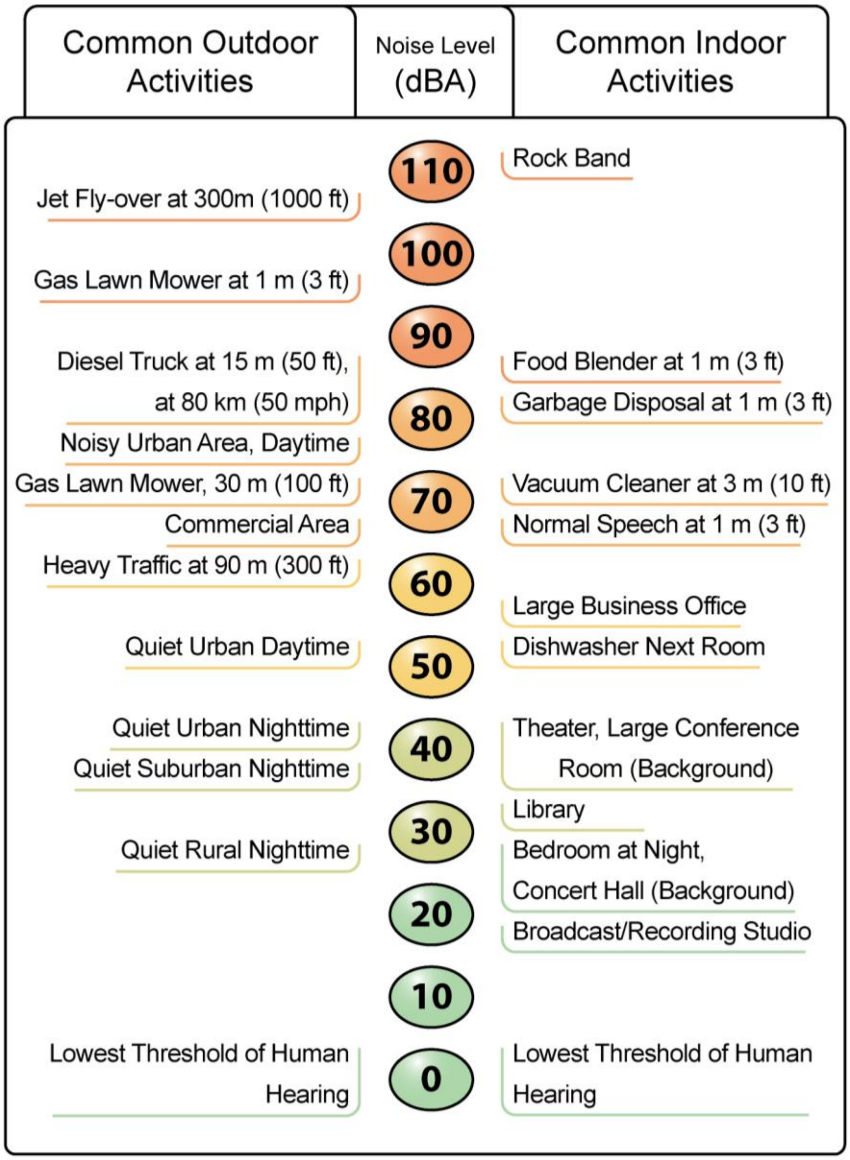


Figure 2-18. Noise Levels of Common Activities

Caltrans' Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction for all impacted receptors in the future noise levels must be achieved for an abatement to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence.

2.2.7.2 Affected Environment

A Noise Impact Assessment Memo was prepared for the project (a Type III project) in April 2014. Additional noise analysis was completed in 2017 and 2019 to evaluate multiple alternatives (Caltrans 2019g). An Analysis of Potential Underwater Construction Noise was completed in 2014 and updated in 2019 to evaluate potential project effects on sensitive fisheries habitat and species. Additionally, an Analysis of Potential Airborne Construction Noise was completed in 2014.

Sensitive noise receptors in the project area include rural residences southwest and northeast of the bridge and the Calvary Chapel of the Redwoods Church northwest of the bridge. The nearest residence is located about 170 feet from the highway and the church is located about 300 feet from the highway. The primary source of noise throughout the area is traffic along Highway 101, State Route 197, and the gravel plant along the South Bank Road.

2.2.7.3 Environmental Consequences

Build Alternatives

Substantial vertical alignment alteration occurs when a project removes shielding, thereby exposing the line-of-sight between the receptor and the traffic noise source. This is done by altering either the vertical alignment of the highway or the topography between the highway traffic noise source and the receptor. There is no natural or man-made shielding in the project limit that breaks the line of sight between the source of noise (highway) and a receptor. Therefore, the alteration of vertical alignment with regard to traffic noise is not considered substantial for all build alternatives.

Substantial horizontal alignment alteration is defined by a project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition. The new alignment under Alternatives 1 and 2 would be approximately 50 feet west of the existing alignment. The residence southwest of the bridge is a sensitive receptor currently located approximately 170 feet from the highway. The proposed change in horizontal alignment under Alternatives 1 and 2 would decrease this distance to approximately 120 feet. Similarly, the distance between the church northwest of the bridge and the highway would decrease from approximately 300 feet to 250 feet under Alternatives 1 and 2. This would not half the distance between any highway and sensitive receptor; therefore, it is not considered a substantial change.

The new bridge under Alternatives 1 and 2 would not have a substantial change in vertical or horizontal alignment. The new bridge under Alternative 3 would have the same vertical and horizontal alignment as the existing bridge. Therefore, all build alternatives are considered "Type III" projects and are exempt from the need to perform a traffic noise impact analysis, under 23 CFR 772. Operational noise impacts are not anticipated to occur under all build alternatives; therefore, noise abatement measures are not considered for this project.

Construction Noise

Under all build alternatives, during the construction phase of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction. Construction for the project would involve the use of diesel-powered heavy equipment for limited excavation, delivery of materials, drilling for the solider piles, cement mixing, backfilling of excavated areas, and paving of the roadway. Based on National Cooperative Highway Research Program data on typical noise ranges generated by earth moving equipment (excavators, backhoes, and trucks), such equipment could generate temporary noise levels of about 82 to 88 dBA at a distance of 50 feet. Materials handling equipment (concrete mixers) could generate noise levels ranging from 75 to 85 dBA at 50 feet. In general, noise levels generated from construction of the proposed project could range from 75 to 88 dBA at 50 feet. Construction activities could exceed ambient maximum noise levels by 6 to 12 dBA in situations where loud construction activities (i.e., pile driving) are located directly adjacent to noise sensitive areas. This noise would attenuate with distance from the noise source. Maximum noise levels generated by other construction activities, such as drilling or the operation of heavy construction equipment, such as dozers or loaders, would generate noise maximum noise levels similar to truck traffic on Highway 101. (Illingworth & Rodkin, Inc. 2014)

Construction noise is temporary and would end when construction is completed.

2.2.7.4 Avoidance, Minimization, and/or Noise Abatement Measures

Chapel-1: Coordinate with Calvary Chapel. To avoid construction-related noise impacts on the Calvary Chapel during church services on Sundays, there would be no construction in close vicinity of the church that could cause noise disturbance to services. The Resident Engineer will coordinate with the church on their service schedule.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.2.8 Energy

2.2.8.1 Regulatory Setting

NEPA (42 USC Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

CEQA Guidelines, Appendix F, Energy Conservation, state that EIRs are required to include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

2.2.8.2 Affected Environment

An energy analysis memo was completed for the project in July 2019 (Caltrans 2019n). A project-level analysis of energy uses data to derive project energy consumption. Energy in a resource context generally pertains to use or conservation of fossil fuels, which are a finite resource. Transportation energy is generally described in terms of direct and indirect energy.

2.2.8.3 Environmental Consequences

Build Alternatives

Direct (mobile sources)

The proposed project includes the reconstruction of a new two-lane bridge along the existing alignment (Alt 1 and 2) and a new alignment (Alt 3).

Direct Energy (Construction)

The basic procedure for analyzing direct energy consumption from construction activities is to obtain fuel consumption projections in gallons based in project specific information. Table

2-10 and 2-11 summarizes estimates the fuel consumption generated by operation for the project during the construction year.

Table 2-10. Annual Construction Fuel Consumption for Alternative 1 and 2

Construction year	Diesel Equipment Fuel Consumption (gallons)	Gasoline Equipment Fuel Consumption (gallons)
2021	12,495	7,530
2022	40,693	23,813
2023	27,604	15,524
2024	21,573	18,075
Total	102,364	64,942

Table 2-11. Annual Construction Fuel Consumption for Alternative 3A/3B

Construction year	Diesel Equipment Fuel Consumption (gallons)	Gasoline Equipment Fuel Consumption (gallons)
2021	11,911	7,179
2022	38,859	22,789
2023	26,302	14,787
2024	20,691	17,392
Total	97,763	62,148

Indirect Energy

The proposed project does not include maintenance activities which would result in long-term indirect energy consumption by equipment required to operate and maintain in the roadway.

The proposed project construction would primarily consume diesel and gasoline through operation of heavy-duty construction equipment, material deliveries, and debris hauling. The project would not increase capacity or provide congestion relief and would not result in wasteful, inefficient, or unnecessary consumption of energy. While construction would result in short-term energy use, construction design features help conserve energy. The project would not result in a permanent new source of energy demand, and demand for fuel would have no noticeable effect on peak or baseline demands for energy.

2.2.8.4 Avoidance, Minimization or Mitigation measures

No avoidance, minimization, or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.3 Biological Environment

A Natural Environmental Study (NES) (Caltrans 2019h) was prepared for the project that included a comprehensive analysis of special-status and sensitive species, local habitats and vegetation communities, and jurisdictional waters at the project site. Natural resources were identified through a review of existing information and biological field surveys. A summary of the biological environment and conclusions from the NES is presented in this document.

2.3.1 Natural Communities

This section of the document discusses natural communities that may be considered Sensitive Natural Communities by CDFW or the CCC. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat, thereby lessening its biological value. Habitats that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in Section 2.3.4, *Threatened and Endangered Species*. Wetlands and other waters are discussed in Section 2.3.2, *Wetlands and Other Waters*.

2.3.1.1 Affected Environment

Sensitive Natural Communities are those natural plant communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects. California's Natural Communities are ranked based on standardized quantitative rarity and threat parameters and Sensitive Natural Communities with a state rarity ranking of S1-S3 may warrant evaluation under CEQA (CDFW 2019). For rarity, the ranking involves the knowledge of range and distribution of a given type of vegetation, and the proportion of occurrences that are of good ecological integrity. Threats and trends are likewise considered in categories such as residential and commercial development, agriculture, energy production and mining, and invasive and other problematic species and genes. Threat scope (typically assessed within a 20-year timeframe for vegetation) and severity are used to calculate an overall threat score, which is added to the overall rarity score for a single rank of 1 through 5. Evaluation is done at both the global (full natural range within and outside of California) and state (within California) levels resulting in a single G (global) and S (state) rank ranging from

1 (very rare and threatened) to 5 (demonstrably secure). Semi-natural stands are not ranked, as these are defined and strongly dominated by non-native species. Sensitive Natural Communities are those that are globally (G) and/or state ranked (S) G/S 1 to 3, where 1 is critically imperiled, 2 imperiled, and 3 vulnerable (CDFW 2019).

Riparian habitat is considered sensitive based on its connectivity to aquatic resources and relative functional values for improving water quality and habitat for aquatic species. Riparian habitat may be evaluated as part of the Section 1602 permit.

The CCA defines ESHAs as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments." Like CDFW's ranking of Sensitive Natural Communities, vegetation alliances and associated communities with ranks of S1-S3 are considered ESHAs by the CCC.

Natural alliances and communities were identified in the Biological Study Area (BSA), which includes the project footprint, plus a buffer to account for potential indirect effects, based on the vegetation classification used in *A Manual of California Vegetation, 2nd edition* (Sawyer et al. 2009) and as maintained on the California Native Plant Society's (CNPS) website available here: http://vegetation.cnps.org/. Four sensitive natural communities, one natural communities, and one semi-natural stand were identified within the BSA. For alliances with State ranks of S1-S3, all associations within them are also considered sensitive (CDFW 2019). In addition to these natural communities or semi-natural stands, the project also includes developed areas, ruderal habitat, the Smith River, and streams (Figure 2-19). Refer to Table 2-12 for a comparison of alliances and natural community names and wetland types.

Table 2-12. Vegetation Alliances and Wetland Types

Wetland Type	Alliance, or Semi-Natural Herbaceous Stand1	Wetland Jurisdiction ACOE	Wetland Jurisdiction CCC
Broadleaf Scrub-shrub	*Salix lasiolepis* Shrubland Alliance[2](Arroyo willow thickets)	No	Yes
Broadleaf Riparian Forest	*Alnus rubra* Red Alder Forest Alliance (Red alder forest)	No	Yes
Palustrine Forested Deciduous (PF06)	*Alnus rubra* Red Alder Forest Alliance (Red alder forest)	Yes	Yes
Palustrine Emergent Persistent (PEM1)	*Agrostis stolonifera - Festuca arundinacea* Semi-Natural Herbaceous (Bent grass – tall fescue meadows)	Yes	Yes
Compacted Herbaceous	*Agrostis stolonifera - Festuca arundinacea* Semi-Natural Herbaceous (Bent grass – tall fescue meadows)	No	Yes
Palustrine Scrub-shrub Broad-leaved Deciduous (PSS1)	*Salix sitchensis* Provincial Shrubland Alliance (Sitka willow thickets)	Yes	Yes
Palustrine Scrub-shrub Broad-leaved Deciduous (PSS1)	Arroyo willow thickets/Sitka willow thickets	Yes	Yes
N/A	*Sequoia sempervirens* Forest Alliance (Redwood forest)	N/A	N/A
N/A	*Umbellularia californica* Forest Alliance (California bay forest)	N/A	N/A

[1] *A Manual of California Vegetation*, 2nd edition (Sawyer et al. 2009) as maintained on CNPS website available here: http://vegetation.cnps.org/.
[2]Alliance contains sensitive natural communities.

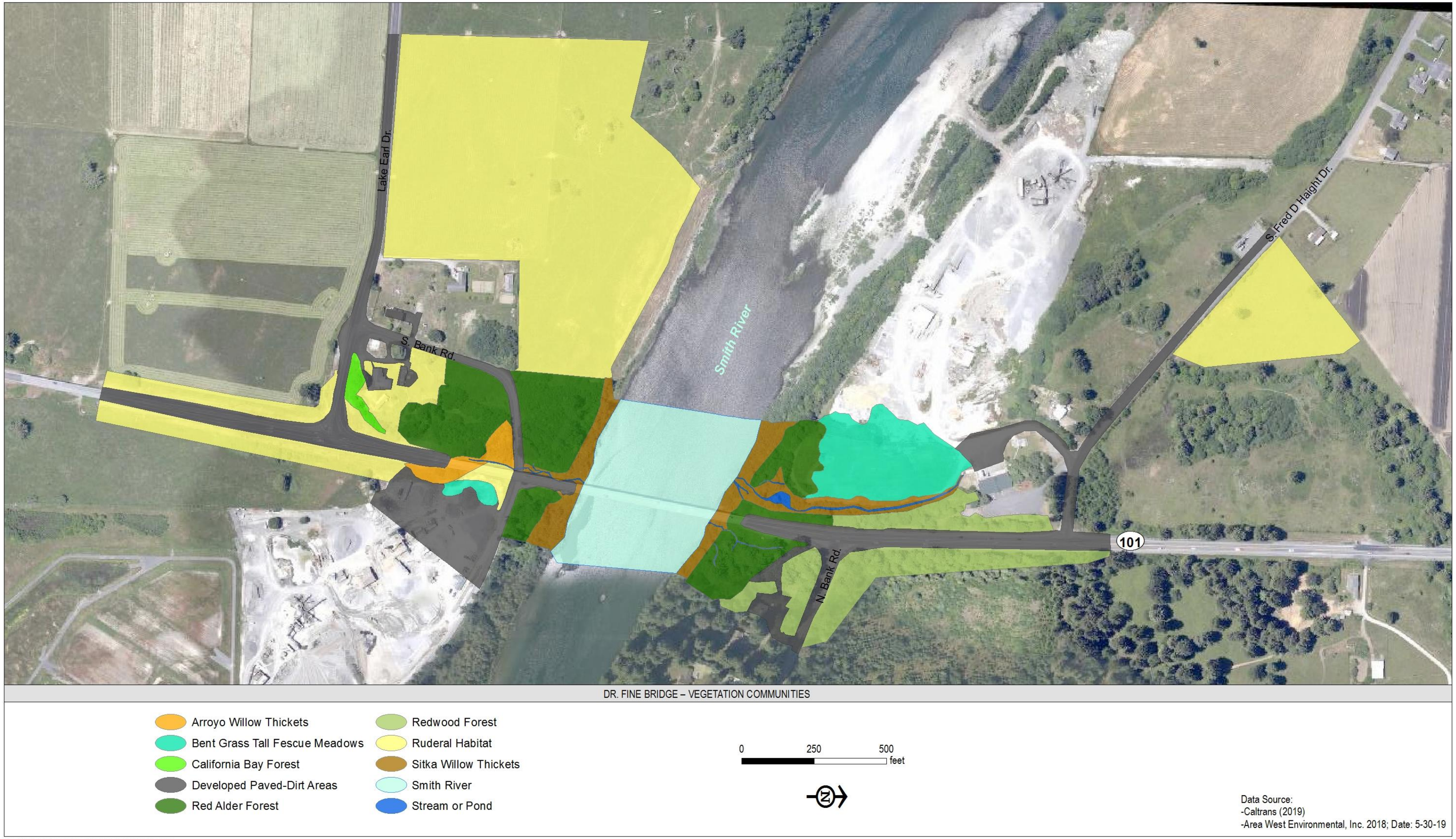


Figure 2-19. Vegetation Alliances in Project Vicinity

Natural Communities/Vegetation Alliances

The following alliances and natural communities are present:

***Sequoia sempervirens* Redwood Forest Alliance and its Communities**

Sequoia sempervirens Redwood Forest Alliance (Redwood Forest) can be found in the northern portion of the BSA in an upland position. With a ranking of G3/S3, all redwood communities within this alliance are considered vulnerable both within the state and globally and are considered Sensitive Natural Communities (CDFW 2019). The dominant species present in this upland community is coast redwood (S*equoia sempervirens*). Sitka spruce (*Picea sitchensis*) and California bay (*Umbellularia californica*) are also common trees in this community. Douglas fir (*Pseudotsuga menziesii*) is also present, although to a lesser degree than the previously listed species.

There is a limited understory due to the proximity of the highway and the area within the BSA is too small to represent a typical stand of redwood forest that could be keyed to the Association level. The understory includes scattered immature cascara (*Frangula purshiana*) and tanoak (*Notholithocarpus densiflorus* var. *densiflorus*), as well as herbaceous species such as several species of *Rubus* and huckleberry (*Vaccinium ovatum*). While vegetation has previously been cut, this has not occurred for several years. This area transitions from Redwood Forest to the riparian areas associated with the Smith River. There are few relictual mature redwood trees present.

***Umbellularia californica* Forest Alliance and its Communities**

Umbellularia californica Forest Alliance (California Bay Forest) occurs in a narrow band in the southern portion of the BSA. The communities within this alliance are considered apparently secure globally and vulnerable in California (G4/S3) and are thus considered Sensitive Natural Communities (CDFW 2019). In the BSA, it is bordered by the highway, Lake Earl Drive, and a residence. California bay is the dominant species. Scattered species include arroyo willow (*Salix lasiolepis*) and wax myrtle (*Morella californica*). There is a large understory of non-native Himalayan blackberry (*Rubus armeniacus*), and greater periwinkle (*Vinca major*). Coyote brush was observed on the fringe of the community as the slope extends up to the highway.

***Salix lasiolepis* Shrubland Alliance and its Communities**

Salix lasiolepis Shrubland Alliance (Arroyo willow thickets) occurs under the south side of the bridge and extends to both the southeast and southwest bridge approach slopes. Some of the communities within this alliance are considered vulnerable globally and vulnerable in

California (G3/S3) and are considered Sensitive Natural Communities (CDFW 2019). On the southeast bridge approach slope and under the bridge, arroyo willow is dominant, with Sitka willow (*Salix sitchensis*) being the next dominant species. On the southwest slope, Sitka willow becomes co-dominant with arroyo willow. This area also includes a few black cottonwood (*Populus trichocarpa*), the only tree species present, as a minor component of the community. Red alder (*Alnus rubra*) and shining willow (*Salix lasiandra* var. *lasiandra*) are also present. The understory includes both California blackberry (*Rubus ursinus*), Himalayan blackberry (*Rubus armeniacus*), and scattered patches of slender-footed sedge (*Carex leptopoda*), pig-a-back plant (*Tolmiea diplomenziesii*), and stinging nettle (*Urtica dioica* ssp. *holosericea*). These stands are also classified as a USACE Palustrine Scrub-shrub Broad-Leaved Deciduous wetland and a Broadleaf Scrub-shrub coastal wetland.

Agrostis stolonifera—Festuca arundinacea Semi-natural Herbaceous Stands

Agrostis stolonifera—Festuca arundinacea Semi-Natural Herbaceous Stand (Bent Grass-Tall Fescue Meadows) occurs within the southeastern section of the BSA between the highway and an active gravel mining operation. Semi-natural Stands are strongly dominated by non-native plants that have become naturalized in the state; no Alliances are defined by non-natives (CDFW 2019). Soil drainage is impeded due to the site being highly compacted and gravelly. No trees are present within this community, and only three species make up the shrub layer with very low coverage: Arroyo willow, Sitka willow, and coyote brush (*Baccharis pilularis*). The bulk of this community consists of non-native herbaceous species, including creeping bentgrass *(Agrostis stolonifera*), tall fescue (*Festuca arundinacea*), bird's foot trefoil, white sweet clover, and pennyroyal. Tall flat sedge (*Cyperus eragrostis*) was a more dominant component of this community closer to the border with the gravel mining operation during delineation efforts but appears to have become less abundant in 2018-19.

The northwest section of the BSA was difficult to classify due to land use, which included a church and parking lot, but most closely resembles the Bent Grass-Tall Fescue Meadows community. This community is adjacent to a developed area that is regularly mowed and used as a field for recreation and sporting events. Historically, it was likely a floodplain terrace dominated by either upland forest or scrub-shrub wetlands. The area is currently dominated with tall fescue, sweet vernal grass (*Anthoxanthum odoratum*), and bentgrass.

The segment of this community closer to the highway is dominated by bentgrass, common rush (*Juncus effuses*), buttercup (*Ranunculus repens*), tall flatsedge, and other, ruderal herbaceous species. This area is a microhabitat within the larger Bent Grass-Tall Fescue Meadows community. This area is closer to a stream that parallels the highway and is slightly more depressed and less vegetated than the adjacent area. It likely ponds longer and has a higher water table. The corresponding wetland classification for the portions of this vegetation alliance north of the Smith River is Palustrine Emergent Persistent. The corresponding wetland classification for the portions of this vegetation alliance south of the Smith River is Compacted Herbaceous Coastal Wetland.

Salix sitchensis Provisional Shrubland Alliance

Salix sitchensis Provisional Shrubland Alliance (Sitka willow thickets) occurs in narrow bands along both banks of the Smith River. It is considered apparently secure globally and vulnerable in California (G4/S3?), and the one community within this alliance is considered a Sensitive Natural Community (CDFW 2019). A "?" indicates the best estimate of the rank when insufficient vegetation plot samples are available over the full expected range of the type, but existing information points to this rank (CDFW 2019). Sitka willow, along with arroyo willow, are the dominant shrubs. Most of the Sitka willow thicket on the southern bank occurs on a mud flat. There is a dense understory of vegetation, including both native and nonnative *Rubus* spp., reed canary grass (*Phalaris arundinacea*) and slough sedge (*Carex obnupta*).

North of the river, this community exhibits greater diversity, likely due to the higher elevation of the riverbank. In addition to Sitka willow, shining willow, thimbleberry (*Rubus parviflorus*), and twinberry (*Lonicera involucrata* var. *ledebourii*) are prominent on this slope, as are herbs such as pig-a-back plant, slender-footed sedge, and stinging nettle. The Sitka willow thickets on the south and north bank of the river correspond with the Palustrine Scrub-shrub Broad-leaved Deciduous wetland category.

Alnus rubra Red Alder Forest Alliance

The riparian area between South Bank Road and the Sitka willow thickets on the south bank of the river is classified *Alnus rubra* Red Alder Forest Alliance (Red Alder Forest). It is demonstrably secure globally and apparently secure statewide (G5/S4), but all communities within the alliance are considered sensitive. Red alder and black cottonwood are co-dominant in the upper canopy layer. Sitka willow, shining willow, arroyo willow are also present. Subshrubs include Himalayan blackberry, twinberry and thimbleberry. California blackberry and slender-footed sedge are also present. Grasses, which are found mostly along the edges of the community, include California brome (*Bromus carinatus*), sweet vernal grass, and tall fescue. Queen Anne's lace (*Daucus carota*) is also within this community. The herb layer comprises species such as hedge nettle (*Stachys chamissonis*), lady fern (*Athyrium filix-femina*), slough sedge, and sword fern (*Polystichum munitum*). California blackberry and Himalayan blackberry are present in the shrub and herb layer.

Red Alder Forest is also found south of South Bank Road. Black cottonwood is more dominant in this portion of the habitat community, as is arroyo willow. Also occurring in this area are two large California bay trees. Pig-a-back plant is a prominent herb. Red Alder Forest south of the bridge is considered a Broadleaf Riparian Forest coastal wetland.

This Red Alder Forest Alliance is also found north of the river, on either side of the bridge. Although red alder is dominant east of the bridge, there are also large stands of shining willow and cascara in this area. A few scattered Sitka spruce and California bay can be found at the northern boundary of the Red Alder Forest where it transitions to Redwood Forest. Northeast of the bridge, this community is classified as Palustrine Forested Deciduous wetland and Broadleaf Scrub-shrub coastal wetland.

Plant species present in this area include vine maple (*Acer circinatum*), California hazelnut (*Corylus cornuta* subsp. *californica*), Pacific ninebark (*Physocarpus capitatus*). Shining willow and cascara are less dominant in this area. Northwest of the bridge, this forested habitat is classified as a Palustrine Forested Broad-leaved Evergreen wetland.

Understory vegetation near the streams on the north side of the river includes California blackberry, Himalayan blackberry, thimbleberry, salmonberry (*Rubus spectabilis*), and slough sedge. Small-flowered bulrush (*Scirpus microcarpus*) is prominent around a ponded area in the northwest section of the BSA.

Ruderal Habitat

Ruderal (disturbed) habitats occur where disturbance is sustained due to human-induced causes such as roadways, buildings, or agriculture. They are typically barren or dominated by non-native plant species. These areas have no corresponding NCSC ranking as they are strongly dominated by human influence and do not represent natural or naturalized communities. They are not included in Table 2-12 as they lack habitat value.

Ruderal upland vegetation (abbreviated as ruderal) can be found along the shoulders of the roadway and southwest, southeast, and far northwest portions of the BSA. The roadway shoulders and the area southwest of the bridge are dominated by velvet grass (*Holcus lanatus*), California blackberry, and Himalayan blackberry. Various herbaceous species and young shrubs are scattered throughout. The blackberry has a patchy distribution, which creates a mosaic vegetation pattern. The perimeter of the area closest to the highway is regularly mowed by Caltrans Maintenance.

An area with compacted gravel, presumably from aggregate extraction operations, is located within the southeast region of the BSA. Vegetation is dominated by creeping bentgrass and other facultative ruderal herbaceous species whose presence is attributed to the coastal climate. Small, scattered shrubs are present near the fringes.

Developed

Developed areas are paved or gravel areas with little or no vegetation. These areas have no corresponding NCSC ranking as they are not natural communities and offer little to no habitat value. They are not included in Table 2-12 as they lack habitat value.

Existing Function and Value of Habitats

The function and value of the habitats at the project site, including sensitive habitats, are reduced under existing conditions because of the surrounding land uses. Portions of the riparian communities at the project site are compromised due to their proximity to the existing bridge where they are subject to periodic disturbance from bridge maintenance, recreational activities, public access, ongoing noise, and visual effects from the bridge and adjacent roadways. Additional current land uses, including gravel storage and processing, transportation, agricultural, and residential uses, as well as previous land uses, including a former trailer park and gas station southwest of the existing bridge, have contributed to the degradation of existing habitats through noise and light impacts, introduction and spread of non-native species, and habitat fragmentation.

Furthermore, the following existing conditions diminish the function and value of Redwood Forest habitat at the project site.

- Large, mature trees (defined as greater than 36-inch diameter at breast height) at the project site are restricted to residual isolated individual trees, as the area was previously logged. Residual trees occur along the corners of U.S. 101 and SR 197 and the band between US 101 and a church northwest of the bridge. These areas are isolated from other mature trees.
- The forest does not provide nesting habitat for listed species—such as marbled murrelet, northern spotted owl, or the federal and state candidate Pacific fisher—as there are no suitable nest trees or cavities and these species tend to avoid highly trafficked areas.
- The habitat is fragmented by highways, as well as other land uses, resulting in trees occurring as narrow bands of habitat (the widest patch is approximately 125 feet in width). The trees west of US 101 are bordered by the highway and church property.
- The trees southeast of the US 101/SR 197 intersection are bordered by the highways and residences. While the forested land northeast of the intersection is contiguous with forest

that extends eastward, the land immediately adjacent to the project site was logged in the recent past and does not constitute an old-growth forest with a stratified canopy.

- There is a limited understory, which is affected by the proximity to the highway, residences, and other development.

Migration Corridors

Wildlife corridors are areas of habitat that allow movement of wildlife from one habitat patch to another for seasonal or daily migration. Stream courses, and their associated riparian areas, are often used as migration corridors by aquatic and terrestrial species. Because rivers can serve as barriers for some species, keeping access open along shorelines can be an important consideration. If corridors are degraded, habitat fragmentation can result. Habitat fragmentation is the process by which habitat loss results in the division of large, continuous habitats into smaller, more isolated remnants, thereby lessening their biological value. Although connecting habitat is often associated with wide-ranging mammals, it is equally important for animals with relatively small ranges, such as rodents and amphibians.

The US 101 and SR 197 highways are partial barriers to migration and contribute to habitat fragmentation by creating strips of unvegetated habitat very dissimilar to the surrounding natural communities. They also increase the potential for wildlife mortality by vehicle collision. To a lesser degree, Lake Earl Drive and South Bank Road south of the river, as well as Fred D. Haight Drive north of the river, also present partial barriers to wildlife movement.

Riparian habitats, although often narrow in width given current land use trends, provide cover and food for small animals, as well as routes for larger wildlife to move along the river’s banks. Riparian habitat can also function as a stopover site for migratory birds. The associated streams form important connecting links between the river and upland habitat.

The Smith River is an important migratory corridor for salmonids and other fish species. By average discharge, it is the largest undammed river system in California. Special consideration has been given to migratory fish species that could be affected by the project. Several build alternatives are considered in this document to determine the least environmentally damaging alternative, in large part, with respect to potential impacts on fish. Agency comments have been considered regarding the potential for large debris to accumulate on temporary piles in the river and cause upstream flooding and fish stranding in overflow channels. Project design has incorporated elements, such as the removal of temporary construction trestle stringers/decks, falsework, and gravel berms during the wettest expected months, to prevent debris from accumulating and causing effects on anadromous fish that use the Smith River as a migration corridor.

Riparian Habitat

Arroyo willow thickets, Sitka willow thickets, and red alder forest are considered riparian habitat based on their connectivity to the BSA waters and relative functional values for improving water quality and habitat for aquatic species. Riparian habitats improve habitat integrity and connectivity to the adjacent redwood forest.

Environmentally Sensitive Habitat Areas

The following habitats meet the CCA definition of ESHAs (note that some habitat types meet multiple criteria):

- Sensitive Natural Communities with ranks of S1-S3 (Redwood Forest, California bay forest, and Sitka willow thickets).
- Wetlands, as described in Section 2.3.2, *Wetlands and Other Waters.*
- Aquatic natural communities in the BSA, including the Smith River, as described in Section 2.3.2.
- Riparian Habitat (Arroyo willow thickets, Sitka willow thickets, and red alder forest).

Mature Trees

Mature trees are defined as trees that are 36-inch diameter at breast height (dbh) or greater. The design of the project considered the protection of mature trees, particularly coast redwoods. Seventy-four mature trees, representing five species, were documented within the BSA (Table 2-13) (Caltrans 2019i).

Table 2-13. Mature Trees within the BSA

Mature Trees within the BSA	
Coast Redwood (*Sequoia sempervirens*)	63
Sitka spruce (*Picea sitchensis*)	2
California bay (*Umbellularia californica*)	7
Black cottonwood (*Populus trichocarpa*)	1
Red alder (*Alnus rubra*)	1
Total number of trees greater than 36″ DBH	74

2.3.1.2 Environmental Consequences

Build Alternatives

All build alternatives would have temporary and permanent impacts on natural communities, as shown in Table 2-14 and Figures 2-20 through 2-22 below. Areas classified as "Developed" are not included in the impact analysis, as these areas lack habitat value. Areas identified as permanent impact in this document would be permanently converted to developed infrastructure associated with the project. The areas identified as temporary impacts in this document are those areas that would be disturbed during construction and restored to natural conditions following project completion. The definition of permanent versus temporary impacts may be modified or otherwise defined during the agency permitting processes.

Natural Communities

While all build alternatives would have temporary and permanent impacts on natural communities, many of these habitats already exist in a degraded condition, and project impacts would be avoided and minimized to the maximum degree possible.

Alternatives 1 and 2 would realign the existing highway and bridge to the west, resulting in a larger overall footprint than Alternative 3. Under Alternatives 1 and 2, slightly more permanent and temporary impacts on natural communities would occur than under Alternative 3. Detailed differences in impacts on natural communities are discussed in Table 2-14.

Compared to Alternative 3, Alternatives 1 and 2 would result in approximately 1.01 acres of additional permanent impacts distributed throughout most habitat types. The majority (approximately 0.66 acre) of the additional 1.01 acre of permanent impacts under Alternatives 1 and 2 versus Alternative 3 would occur in ruderal areas west of the highway. Construction of viaducts and retaining walls on a new western alignment under Alternatives 1 and 2 would result in minor permanent impacts on red alder forest, Sitka willow, California bay forest, and redwood forest, whereas permanent impacts on these areas would be less under Alternative 3.

Alternative 1 has nearly identical impacts on natural communities as Alternative 2. Variations in permanent and temporary impacts between Alternative1 and Alternative 2 are due only to the number, location and size of bridge piers for the CIP and PC bridge structure.

Table 2-14. Temporary and Permanent Impacts on Land Cover Types

Land Cover Type	Alternative 1 CIP West: Temporary Impact (acres)	Alternative 1 CIP West: Permanent Impact (acres)	Alternative 2 PC West: Temporary Impact (acres)	Alternative 2 PC West: Permanent Impact (acres)	Alternative 3* CIP On-alignment: Temporary Impact (acres)	Alternative 3* CIP On-alignment: Permanent Impact (acres)
Bent Grass Tall Fescue Meadows	0.318	0.000	0.318	0.000	0.316	0.000
Red Alder Forest	2.298	0.260	2.292	0.265	2.190	0.073
Arroyo Willow Thickets	0.318	0.015	0.323	0.009	0.335	0.004
Sitka Willow Thickets	1.176	0.024	1.180	0.020	0.796	0.005
California Bay Forest	0.127	0.020	0.127	0.020	0.051	0.000
Redwood Forest	0.391	0.174	0.391	0.174	0.172	0.057
Smith River	2.014	0.012	2.008	0.018	1.989	0.012
Streams	0.119	0.001	0.119	0.001	0.066	0.000
Ruderal Habitat	24.379	0.709	24.380	0.709	24.848	0.050
TOTAL	31.140	1.215	31.138	1.216	30.763	0.201

*Alternative 3A and Alternative 3B would have the same impact area.

Figure 2-20. Alternative 1 Impacts on Natural Communities

Figure 2-21. Alternative 2 Impacts on Natural Communities

Figure 2-22. Alternative 3 Impacts on Natural Communities

Riparian Habitat

Riparian habitat includes Arroyo willow thickets, Sitka willow thickets, and red alder forest. All build alternatives would have permanent and temporary impacts on riparian habitat (Table 2-15). Due to the larger overall footprint for the new alignment, Alternatives 1 and 2 would have approximately 0.47 acre of additional temporary impacts and approximately 0.22 acre of additional permanent impacts on riparian habitat when compared to Alternative 3.

Table 2-15. Temporary and Permanent Impacts on Riparian Habitat for Each Build Alternative

Natural Community	Alternative 1 CIP West: Temporary Impact (acres)	Alternative 1 CIP West: Permanent Impact (acres)	Alternative 2 PC West: Temporary Impact (acres)	Alternative 2 PC West: Permanent Impact (acres)	Alternative 3* CIP On-alignment: Temporary Impact (acres)	Alternative 3* CIP On-alignment: Permanent Impact (acres)
Arroyo Willow Thickets	0.318	0.015	0.323	0.009	0.335	0.004
Red Alder Forest	2.298	0.260	2.292	0.265	2.190	0.073
Sitka Willow Thickets	1.176	0.024	1.180	0.020	0.796	0.005
TOTAL	3.792	0.299	3.795	0.294	3.321	0.082

*Alternative 3A and Alternative 3B would have the same impact area.

Environmentally Sensitive Habitat Areas

All build alternatives would have temporary and permanent impacts on ESHAs, as shown in Table 2-16. Due to the larger overall footprint for the new alignment, Alternatives 1 and 2 would have approximately 0.85 acre of additional temporary impacts and approximately 0.36 acre of additional permanent impacts on ESHAs when compared to Alternative 3.

Table 2-16. Temporary and Permanent Impacts on ESHAs

Habitat (Natural Community and/or Wetland Type)	ESHA Criteria	Alt 1: Temporary Impact (acres)	Alt 1: Permanent Impact (acres)	Alt 2: Temporary Impact (acres)	Alt 2: Permanent Impact (acres)	Alt 3*: Temporary Impact (acres)	Alt 3*: Permanent Impact (acres)
Redwood Forest (Sequoia sempervirens Redwood Forest Alliance)	S3 Ranking	0.391	0.174	0.391	0.174	0.172	0.057
Smith River- Other Water	Aquatic Habitat	2.014	0.012	2.008	0.018	1.989	0.012
Streams- Other Water	Aquatic Habitat	0.119	0.001	0.119	0.001	0.066	0.000
Arroyo Willow Thickets (Salix lasiolepis Shrubland Alliance) Wetland Designation: Palustrine Scrub-shrub Broad-leaved Deciduous and Broadleaf Scrub-shrub and Broadleaf Shrub-scrub	Wetland Riparian Habitat & S3 Ranking	0.318	0.015	0.323	0.009	0.335	0.004
Red Alder Forest (Alnus rubra Forest Alliance) Wetland Designation: Palustrine Forested Broad-Leaved Deciduous or Evergreen (in part) and Broadleaf Riparian Forest wetland	Wetland Riparian Habitat & S4 Ranking	2.298	0.260	2.292	0.265	2.190	0.073
Bent Grass Tall Fescue Meadows (Agrostis stolonifera – Festuca arundinacea Semi-natural Herbaceous Stands) Wetland Designation: Palustrine Emergent Persistent (in part)	Wetland (in part)	0.318	0.000	0.318	0.000	0.316	0.000
Sitka Willow Thickets (Salix sitchensis Provisional Shrubland Alliance) Wetland Designation: Palustrine Forested Broad-leaved Deciduous and Palustrine Emergent (in part)	S3? Ranking Wetland Riparian Habitat & S3? Ranking	1.176	0.024	1.180	0.020	0.796	0.005
California Bay Forest (Umbellularia californica Forest Alliance)	S3 Ranking	0.127	0.020	0.127	0.020	0.051	0.000
TOTAL	N/A	6.761	0.506	6.758	0.507	5.915	0.151

Tree Impacts

Implementation of all build alternatives would require the removal of mature trees, as shown in Table 2-17.

Table 2-17. Mature Trees to be Removed Under Each Build Alternative

Tree Species	Number of Mature Trees (>36 in) to be Removed	
	Alternative 1 & 2 West-alignment	Alternative 3 CIP On-alignment
Douglas-fir *Pseudotsuga menziesii*	1	0
California bay *Umbellularia californica*	4	0
Sitka spruce *Picea sitchensis*	1	2
Coast redwood *Sequoia sempervirens*	5	14
Red Alder *Alnus rubra*	0	1
TOTAL	11	17

Alternatives 1 and 2 would result in the removal of 11 mature trees and Alternative 3 would result in 17 mature trees being removed. Alternatives 1 and 2 would result in the loss of four large California bay. Alternative 3 would result in the removal of nearly three times as many mature redwood trees than Alternative 1 and 2.

For all build alternatives, the trees over 36 inches dbh that would be removed constitute a small amount of the overall habitat cover in the area. Removal of these individual trees would not appear to have a substantial effect on the overall quality, function of the habitat communities, or appreciably affect wildlife corridors. The large-diameter affected trees are largely confined to roadside areas of the north and along or under the existing bridge on the south. These trees are associated with areas that would be revegetated and/or where wetland or riparian habitats would be enhanced through planting and removal of non-native plants.

Ground disturbance during construction activities under all build alternatives could also affect tree roots without removal of the tree itself. Primary project activities that could affect tree roots include any excavation that severs fine absorbing and structural roots or compaction that impacts absorbing roots near soil surfaces. Such activities include the clearing of trees adjacent to construction areas (temporary impacts) or areas that are to be converted to new structures or roadways (permanent impacts) such as retaining walls, viaducts, or the placement of constructed fill to support new road alignments.

Within the impact area, tree removal recommendations were based on the assessment of impacts on both the structural root zone and root health zones (described below) for trees that are equal to or greater than 36 inches dbh. This analysis was completed by reviewing graphical illustrations that show the two root zones for each tree greater than 36 inches dbh and a layout of proposed work within these areas of each tree. Emphasis was placed on potential effects on the structural root zone since it contains the majority of the tree's large supporting structural roots that provide stability.

- Structural root zone (SRZ) is a circular area with the tree trunk at the center and a radius equal to three times the tree's dbh. The SRZ distance encompasses the major structural roots that support tree weight and distribute wind loads and is the minimum distance within which serious root disturbance should be avoided (Smiley et al. 2002). Removal or shaving of up to 20 percent of the structural support roots is unlikely to affect tree stability because trees generally have a safety factor in the range of 4.5 times the strength required to resist the expected stress load (Dunster 2009). As a result, tree removal was recommended for all trees with impacts on greater than 30 percent of the SRZ.
- Root health zone (RHZ) is a circular area with the tree trunk at the center and a radius equal to five times the tree's dbh. Removal of up to 40 percent of the RHZ of trees in general, including redwood, is unlikely to have a substantial effect on the overall health and stability of the trees because absorbing roots are ephemeral under undisturbed conditions and reproduce rapidly (Harris et al. 1999) if post-project soil conditions are restored following construction. The RHZ is considered the minimum distance from the tree needed to protect the long-term health and stability of tree. No tree removal was recommended for trees with impacts on less than 40 percent of the RHZ.

Although effects on roots of all tree species were considered, the tree root analysis focused on potential effects on redwood trees due to their unique importance in northern California and their dominance in the upland forested areas within the project disturbance limits. One of the main considerations when evaluating the effects of construction on redwood trees is the ability of the species to tolerate disturbance.

As a result, tree removal was recommended for all trees with impacts on greater than 30 percent of the SRZ.

The SRZ of five and fourteen redwoods would be substantially impacted in Alternatives 1/2 and Alternative 3, respectively, thus the trees were recommended for removal. Details for the impacts on the trees under all alternatives indicate that all 11 of the trees to be removed under Alternatives 1 and 2 are recommended for removal because their trunk is in the impact area.

Six additional trees (all redwoods) have less than 30 percent impacts on their SRZ and are not recommended for removal in Alternatives 1 and 2. Coast redwood trees are able to overcome disruptions to their root systems, including the loss of a large portion of their root systems, by rapidly regenerating a new root system (Yniguez 2013).

Six of the 17 trees to be removed by Alternative 3 would also be removed under Alternatives 1 and 2. Two are recommended for removal because their stem is in the impact area and the remaining four would have impacts ranging from 40–70 percent of the SRZ. Alternative 3 impact areas could damage the SRZ of eight additional trees but these trees are not recommended for removal because these impacts are 30 percent or less of the SRZ. Four of these trees are California bay and four are redwoods. Both species are known to regularly resprout from their bases and recovery of these healthy trees is probable.

Additional tree species within the BSA with less than 36-inch dbh include cascara, English holly (*Ilex aquifolium*), tanoak, Douglas-fir, red willow (*Salix laevigata*), arroyo willow, Pacific willow, Sitka willow, western hemlock (*Tsuga heterophylla*), and big-leaf maple. All build alternatives may include the removal of some of these tree species; however, tree removal would be minimized, as described below.

2.3.1.3 Avoidance, Minimization, and/or Mitigation Measures

Riparian-1. Compensatory mitigation would be required to offset permanent and temporary impacts on riparian habitat. Caltrans proposes restoration and replanting of temporarily disturbed areas to enhance riparian habitat. Native vegetation will be planted. Options for on-site riparian restoration areas include restoring the unvegetated disturbed area along the Smith River’s south bank. Off-site options include off-channel enhancements on tributaries of the Smith River such as Stotenburg Creek channel work and coordinating with watershed steward organizations such as the Smith River Alliance. Mitigation ratios for riparian impacts in the past for projects within the coastal zone have been 4:1, but final ratios would be determined in coordination with the resource agencies.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.3.2 Wetlands and Other Waters

2.3.2.1 Regulatory Setting

Wetlands and other waters 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 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 U.S., 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 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 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 CFR Part 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 FHWA and/or the Department, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated primarily by SWRCB, RWQCB, and the 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 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 that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will 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 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. See Section 2.2.2, *Water Quality and Storm Water Runoff*, for additional details.

2.3.2.2 Affected Environment

Wetlands and other waters of the U.S. were delineated in the project area in 2014 and 2015 using the 1987 USACE Wetland Delineation Manual on-site method (Environmental Laboratory 1987). Wetland habitats were described using the updated *Classification of Wetlands and Deepwater Habitats of the United States* (Federal Geographic Data Committee 2013), as originally drafted by Cowardin et al. (1979).

The following USACE and CCC jurisdictional wetlands are present:

- Palustrine Emergent Persistent (PEM1).
- Palustrine Forested Evergreen (PFO7).
- Palustrine Scrub-shrub Broad-leaved Deciduous (PSS1).

CCC (one-parameter wetlands only) includes:

- Broadleaf Scrub-shrub.
- Broadleaf Riparian Forest.
- Compacted Herbaceous Wetland.

USACE and CCC jurisdictional wetlands are shown on Figure 2-23.

The Smith River is a riverine natural community providing habitat for fish and other aquatic species. The jurisdictional waters within the BSA include the Smith River and several unnamed streams that enter the Smith River from the north and south:

- Northwest of the bridge—three streams are northwest of the bridge:
    - The longest stream appears to be fed from a spring south of Fred D. Haight Drive and possibly residual flow from drainages that originate north of the project area. The historical sources of flow to this perennial stream have been modified. This is likely a result of construction of US 101 and a church. There is an abrupt grade drop in the channel near its confluence with the river. This stream and its ponded areas provide habitat for amphibians.
    - A 100-foot long perennial stream with a side branch outlet to the river.
    - The westernmost of the streams is an ephemeral drainage that is approximately 85 feet in length. This drainage does not outlet to the river as flow goes subsurface 100 feet upslope from the river.
- Northeast of the bridge—there are two intermittent streams northeast of the bridge:

    - A stream originates from a seep or storm water drainage and is approximately 275 feet in length and outlets to the river. The width of this stream varies as the channel is not clearly defined and often flow is hidden beneath considerable plant material.
    - A stream is from a seep or existing storm water drainage and is 45 feet in length. This stream does not reach the Smith River. The width of this stream varies as the channel is not clearly defined and often flow is hidden beneath considerable plant material.

- Southwest of the bridge—an ephemeral drainage, approximately 350 feet long, runs parallel to the highway southwest of the bridge. It flows through a culvert under South Bank Road but dissipates before reaching the river, except during periods of high flow. A 35-foot-long branch connects to the larger drainage. Water was present in both branches during the February 2017 field review with USACE. However, during the early May 2017 botanical surveys, both branches did not appear to have carried any flow recently as the bed, bank, and channel of both were barely discernable and covered with vegetation. The outlet of the culvert was not visible as the area was overgrown with vegetation, in particular Himalayan blackberry.

Figure 2-23 Wetlands in the Project Vicinity

2.3.2.3 Environmental Consequences

Build Alternatives

All build alternatives would have temporary and permanent impacts on waters and wetlands of the U.S. and State, as defined in section 2.3.2.2, and shown in Table 2-18 and Figures 2-24 through 2-26 below. Definitions of permanent versus temporary impacts on wetlands and waters may vary during the permitting process.

All build alternatives would result in a permanent net-gain of river habitat through the reduction of bridge foundations in the river. Under existing conditions, the bridge has three bridge piers within the Smith River channel (below the OHWM). In contrast, Alternatives 1 and 3 would have one bridge pier and Alternative 2 would have two bridge piers in the Smith River channel. As shown on Figures 2-24 and 2-25, the pier on the south bank under Alternative 1 (“Pier 3”) and Alternative 2 (“Pier 4”) also would be partially within the Smith River OHWM. Although Alternative 2 would construct more piers in the Smith River than Alternative 1, the Alternative 2 piers are each smaller (6-foot diameter columns) than the Alternative 1 piers (8-foot diameter columns), so the permanent impact area in the Smith River is the same under both western alignment alternatives. The permanent impact area in the Smith River is smallest under the on-alignment alternative (Alternative 3), which has one pier in the river; the Alternative 3 south bank pier is above the OHWM.

As shown in Table 2-18, total permanent impacts on all wetlands (USACE and Coastal) would be 0.062 acre, 0.065 acre, and 0.017 acre under Alternatives 1, 2, and 3, respectively. Total temporary impacts on all wetlands (USACE and Coastal) would be 3.040 acre, 3.038 acre, and 2.946 acres for Alternatives 1, 2, and 3, respectively. Differences in wetland impacts between alternatives are a function of the bridge alignments, size of work footprint, and location of wetland areas relative to proposed construction activities and permanent features.

Table 2-18. Temporary and Permanent Impacts on Waters and Wetlands

Waters and Wetlands	USACE Jurisdiction	CCC Jurisdiction	Alt 1: Temporary Impact (acres)	Alt 1: Permanent Impact (acres)	Alt 2: Temporary Impact (acres)	Alt 2: Permanent Impact (acres)	Alt 3*: Temporary Impact (acres)	Alt 3*: Permanent Impact (acres)
Smith River- Other Water	Yes	No	2.142	0.022	2.143	0.022	2.134	0.013
Streams- Other Water	Yes	No	0.115	0.001	0.115	0.001	0.063	0.000
Broadleaf Scrub-shrub - Coastal Wetland	No	Yes	0.102	0.003	0.102	0. 003	0.313	0.000
Palustrine Emergent Persistent (PEM1) - USACE Wetland	Yes	Yes	0.355	0.000	0.355	0.000	0.355	0.000
Palustrine Forested Deciduous (PF07) - USACE Wetland	Yes	Yes	0.000	0.000	0.000	0.000	0.156	0.000
Broadleaf Riparian Forest - Coastal Wetland	No	Yes	1.203	0.033	1.198	0.039	1.355	0.003
Palustrine Scrub-shrub Broad-Leaved Deciduous (PSS1) - USACE Wetland	Yes	Yes	1.380	0.026	1.383	0.023	0.767	0.014
Total Other Waters	Yes	No	2.257	0.023	2.258	0.023	2.197	0.013
Total Wetlands (USACE and Coastal)	Yes	Yes	3.040	0.062	3.038	0.065	2.946	0.017
USACE Wetlands only	Yes	No	1.735	0.026	1.738	0.023	1.278	0.014
Coastal Wetlands only	No	Yes	1.305	0.036	1.300	0.042	1.668	0.003

*Alternative 3A and Alternative 3B would have the same impact area.

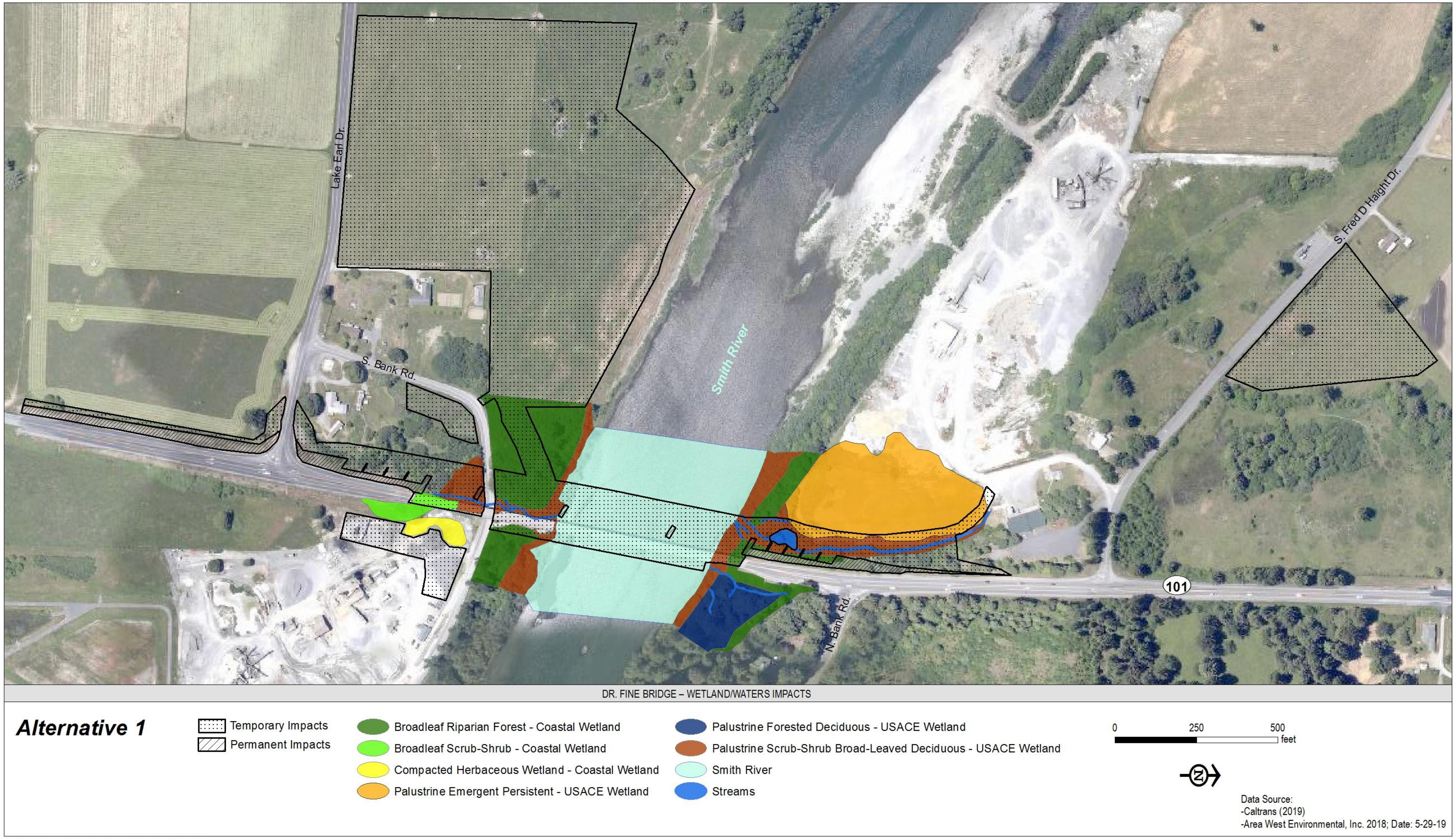


Figure 2-24. Alternative 1 Impacts on Wetlands

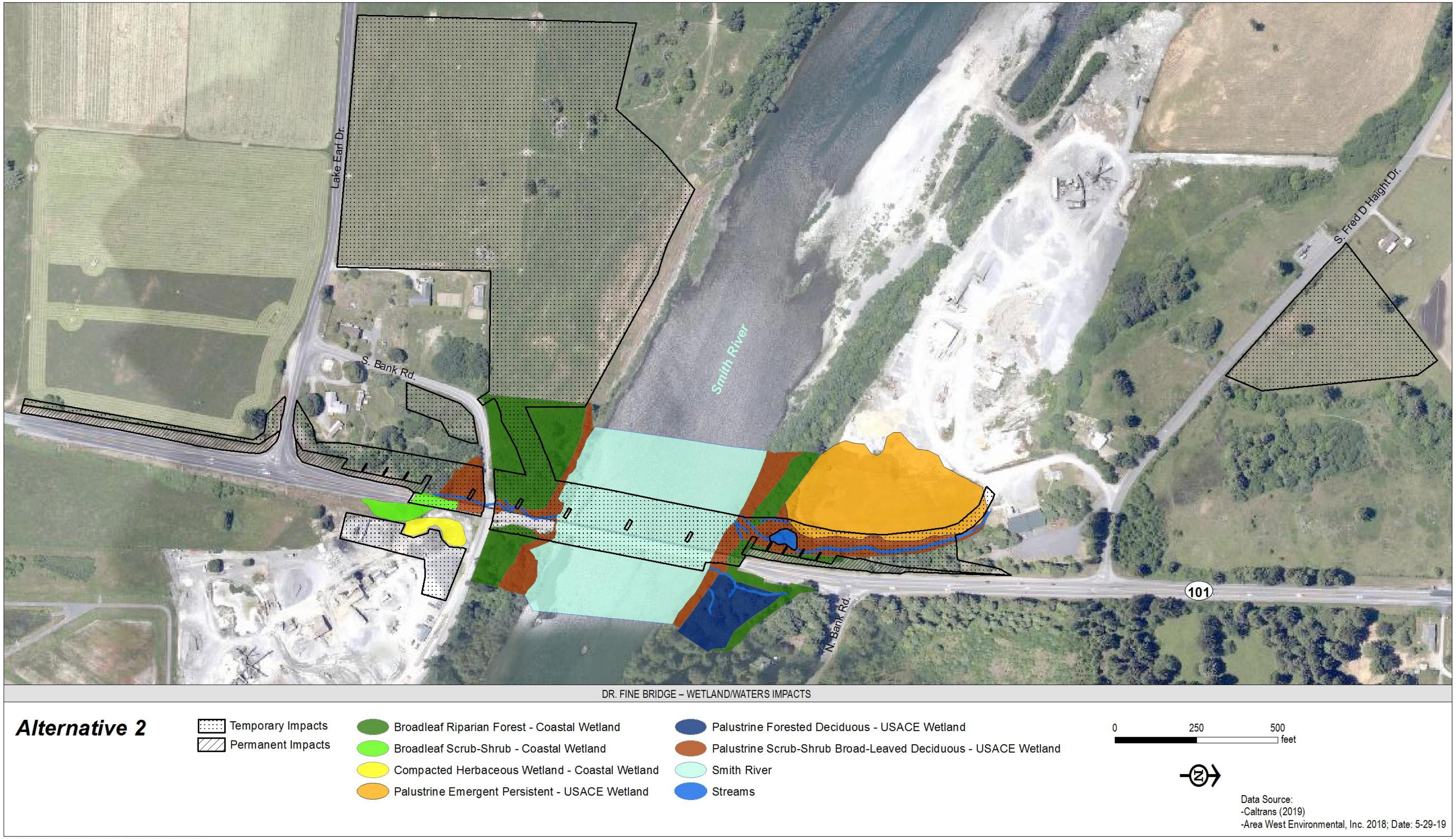


Figure 2-25. Alternative 2 Impacts on Wetlands

Figure 2-26. Alternative 3 Impacts on Wetlands

Under Alternatives 1 and 2, construction access needed for the new westerly alignment would require more temporary and permanent impacts in the stream, riparian, and wetland habitat northwest of the bridge and a larger temporary work area in riparian and wetland habitats southwest of the bridge, when compared to Alternative 3. In the northwest area, temporary impacts would result from the temporary diversion of a stream, temporary dewatering of the area, and additional vegetation removal for equipment access to construct the new viaduct and retaining wall. All temporarily disturbed areas would be restored after construction. Permanent impacts in the northwest project area under Alternatives 1 and 2 would result from the construction of the viaduct.

Under Alternative 3, temporary and permanent impacts on a majority of the stream, riparian, and wetland habitat in the area northwest of the bridge can be avoided. Nevertheless, under Alternative 3, a temporary access road would be constructed through palustrine emergent persistent and palustrine scrub-shrub broad-leafed deciduous (PSS1) wetland northwest of the bridge (Figure 2-26) to allow equipment access to temporary gravel berms in the Smith River. However, most of the access route would not require tree removal; the portion of PSS1 wetland in this area overhangs the proposed access route and may need to be trimmed but not removed.

Alternative 3 would result in temporary and permanent wetland impacts east of the existing bridge to construct access and approach work for the temporary detour bridge. Alternative 3 work limits include both USACE and Coastal wetlands northeast and southeast of the bridge. Under Alternative 3, construction of the retaining wall southeast of the new bridge approach would result in temporary impacts on Broadleaf Scrub-shrub- Coastal Wetland. Under Alternatives 1 and 2, permanent and temporary impacts on wetlands east of the roadway could largely be avoided. Due to the larger work footprint of Alternatives 1 and 2, Alternative 3 would result in less permanent and temporary impacts on wetlands than Alternatives 1 or 2.

Under all three alternatives, the pond northwest of the bridge, the compacted herbaceous wetland southeast of the bridge, and all wetlands and riparian habitats bordering work areas would be avoided and protected with ESA fencing.

All build alternatives could affect water quality of both wetlands and other waters within and adjacent to the BSA. Potential short-term water quality impacts would be primarily associated with erosion of exposed or disturbed soils and pollutants entering the Smith River and adjacent streams. Construction would cause disturbances to the ground surface from earthwork, which could potentially increase the amount of sediment entering the river.

Runoff during the winter season is of greatest concern due to the potential erosion of unprotected or graded surfaces. Sediments suspended in runoff could be carried downstream, which, if not controlled, could accumulate in downstream watercourses, potentially harming any downstream aquatic resources and water quality.

Materials used during construction (e.g., concrete curing compounds) may have chemicals that are potentially harmful to aquatic resources and water quality. Accidents or improper use of these materials could release contaminants to the environment. Additionally, oil and other petroleum products used to maintain and operate construction equipment could be accidentally released.

Potential long-term, operation water quality effects associated with all build alternatives could occur from pollutants entering a water body via storm water runoff. Storm water runoff rates may be increased by the addition of impervious roadway surface areas, modifications of design features in the channel, and alterations to stream morphology.

To maintain water quality and minimize the movement of soils and sediment into and within aquatic resources under all build alternatives, effective erosion- and pollution-control measures would be developed and implemented. Construction BMPs described in the SWPPP would be implemented to protect the watercourse during construction activities, and post-construction operations would maintain site hydrology and reduce runoff pollutants relative to existing conditions.

2.3.2.4 Avoidance, Minimization, and/or Mitigation Measures

Wetlands-1. While the standard measures built into the project would help offset potential effects, Caltrans anticipates pursuing compensatory mitigation for impacts on wetlands and other waters. Both on-site enhancement and off-site restoration are being considered. Mitigation options include, but are not limited to, the following.

- On-site enhancement of Compacted Herbaceous Wetland south of Smith River.
- On-site revegetation and enhancement (e.g., invasive species removal) within Palustrine Scrub-Shrub, Broadleaf Riparian Forest, and Palustrine Deciduous habitats both north and south of the Smith River in the project vicinity.
- Off-site stream restoration and fish passage improvement at Dominie Creek, a tributary to Rowdy Creek that flows into the Smith River approximately four miles north of the project site.

- Off-site wetland preservation and enhancement at the Hambro property, located northwest of and directly adjacent to Caltrans' Crescent City Marsh Wildlife Area. At least 9 acres of temporary wetland mitigation credit has been secured for the project at this location.
- Off-site riparian, wetland, and stream improvements within the Smith River watershed, such as Stotenburg Creek channel work, undertaken in cooperation with watershed stewardship organizations.

Mitigation may include a combination of on- and off-site restoration efforts. If off-site restoration were implemented, the appropriate measures would be identified and coordinated through USACE, North Coast RWQCB, and CCC. Wetland mitigation ratios in the coastal zone are typically 4:1; exact ratios would be determined in coordination with the permitting agencies.

2.3.3 Animal Species

2.3.3.1 Regulatory Setting

Many state and federal laws regulate impacts on wildlife. The USFWS, the National Oceanic and Atmospheric Administration's 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 Endangered Species Act (FESA) and/or California Endangered Species Act (CESA). Species listed or proposed for listing as threatened or endangered are discussed in Section 2.3.4, *Threatened and Endangered Species*. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act.
- Migratory Bird Treaty Act.
- Fish and Wildlife Coordination Act.
- Marine Mammal Protection Act.
- Magnuson–Stevens Act.

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act.
- Sections 1600 – 1603 of the California Fish and Game Code.
- Sections 4150 and 4152 of the California Fish and Game Code.

For the purpose of this document, special-status wildlife species are generally defined as follows:

- Wildlife species that are designated as Species of Special Concern by CDFW (CNDDB 2019).
- Wildlife species that are designated as Fully Protected by CDFW (California Fish and Game Code (CFGC), Section 3511, 4700, 5050, and 5515).
- Wildlife species that meet the definition of rare or endangered under CEQA (14 CCR 15380).
- Wildlife species protected under the Migratory Bird Treaty Act or Marine Mammal Protection Act.
- Wildlife species that CDFW has assigned a state rank of S1, Critically Imperiled, or S2, Imperiled.

Wildlife species that are listed or proposed for listing as threatened or endangered under FESA and/or CESA are addressed in Section 2.3.4*, Threatened and Endangered Species.*

2.3.3.2 Affected Environment

An NES (Caltrans 2019h) was prepared for the project. Table 2-19 lists the special-status fish and wildlife species that are known to occur or have the potential to occur in the geographic region. These species were identified based on the California Natural Diversity Database (CNDDB) records search (2019) and species distribution and habitat requirements data.

Table 2-19. Special-status Wildlife Species with the Potential to Occur in the Vicinity of the Project

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale
	Federal	State			
Mammals					
Ringtail *Bassariscus astutas*	--	FP	Riparian forests, chaparral, scrub, oak woodlands, and rocky hillsides with crevices and tree hollows 3 inches in diameter or greater. Avoids open space and moves from tree to tree or along structures. Omnivorous and will feed on berries such as toyon or mistletoe leaves and berries and will vary depending on the seasons and food availability.	Present	Riparian habitat in the BSA represents potential habitat for ringtail.
Bat sp. *Chiropterans* spp.	--	SSC	In general, bat species typically forage in open areas and roost in crevices.	Present	Evidence of night roosting observed on existing Dr. Fine Bridge (species unknown). Based on a habitat assessment/survey results, no suitable habitat features that could support day and/or maternity roosts are present within the existing bridge. If present, cavities within trees in the BSA could support tree roosting bat species (such as silver-haired bat)
Steller (=northern) sea-lion *Eumetopias jubatus*	MMPA	--	Marine intertidal & splash zone communities, protected deepwater coastal communities, and rock shore.	Absent	No habitat within the BSA.
Harbor seal *Phoca vitulina*	MMPA	--	Occurs in California coastal waters, close to shore in subtidal and intertidal habitats. Often swim into bays and estuaries, and sometimes venture into rivers in northern California. Frequently haul out in small to moderate-sized groups on emergent offshore and tidal rocks, mudflats, sandbars, and sandy beaches.	Present	Known to occur in Smith River near Dr. Fine Bridge.

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale
	Federal	State			
California sea lion *Zalophus californianus*	MMPA	--	Found in shallow coastal and estuarine waters. Sandy beaches are preferred for haul-out sites. In California, they haul-out on marina docks as well as jetties and buoys.	Present	Although sea lions are infrequent visitors to the Smith River, it is possible that individuals could range upstream to the project site.
Birds					
Migratory Birds	MBTA	--	Varies	Present	Barn swallows have been observed nesting on the bridge, and other passerines are expected to nest in the adjacent riparian vegetation and other habitat in the BSA.
northern harrier *Circus hudsonius*	--	SSC	Most common in large, undisturbed tracts of wetlands and grasslands with low, thick vegetation. They breed in wide-open habitats such as freshwater and brackish marshes, and lightly grazed meadows. Western populations tend to breed in dry upland.	Present	Northern harriers could nest on the ground within and forage in the agricultural fields adjacent to the BSA.
Yellow rail *Coturnicops noveboracensis*	--	SSC	Found in grassy meadows or sedge marshes. Rare breeder in the United States	Absent	The BSA is outside of the typical range of this species.
black swift *Cypseloides niger*	--	SSC	Open sky over mountains, coastal cliffs. Forages widely over any kind of terrain but is still very local in its occurrence, probably limited to regions with suitable nesting sites. Nests on ledges or in crevices in steep cliffs, either along coast or near streams or waterfalls in mountains.	Absent	No suitable nesting habitat in BSA.
white-tailed kite *Elanus leucurus*	--	FP	Commonly found in savanna, open woodlands, marshes, desert grassland, partially cleared lands, and cultivated fields.	Present	There is moderate potential the species could nest within trees in the BSA and forage in the agricultural fields adjacent to the BSA.

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale
	Federal	State			
tufted puffin *Fratercula cirrhata*	--	SSC	Nests mostly in deep burrows that it digs into cliff edges and slopes. Breeds on coastal slopes in ground burrows, sometimes under boulders and piles of rocks, occasionally under dense vegetation.	Absent	There is no suitable habitat for the species within the BSA.
fork-tailed storm-petrel *Oceanodroma furcata*	--	SSC	Nest on offshore rocks and islands in burrows dug in soil, or in natural rock crevices.	Absent	There is no suitable habitat for the species within the BSA.
Amphibians and Reptiles					
Pacific tailed frog *Ascaphus truei*	--	SCC	Occurs in coniferous forests including redwood and Douglas-fir habitats, frequently in mature or late-successional stages. Prefers cool, steep, forest stream habitats.	Present	Low likelihood of the species being present in the streams and forested habitat north of the bridge.
western pond turtle Emys marmorata	--	SSC	Associated with creeks, ponds, slow-moving sloughs, and quiet waters. Prefers exposed areas for basking, with aquatic vegetation, such as algae and other water plants, but they also live in clear waters, especially where there is cover such as boulders or fallen trees in the water.	Present	Low probability the species could use the streams and the ponded area within the BSA.
northern red-legged frog *Rana aurora*	--	SSC	Associated with humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover.	Present	Known to occur in the ponded area in northwest section of BSA.
southern torrent salamander *Rhyacotriton variegatus*	--	SSC	Associated with late seral coast redwood, Douglas-fir, mixed conifer, and montane hardwood-conifer habitats. Inhabits cold, well-shaded, permanent streams and seepages.	Absent	Unlikely to be present within the BSA

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale
	Federal	State			
Fish					
North American green sturgeon (Northern DPS) *Acipenser medirostris*	--	SSC	Spend majority of time in nearshore oceanic waters, bays, and estuaries. Freshwater is used by young fish to rear and adults to spawn.	Present	Known to be an infrequent visitor to Smith River
Pacific lamprey *Entosphenus tridentatus*	SOC	SSC	Riffle and side channel habitats are important for spawning and for ammocoete rearing. Because lamprey ammocoetes colonize areas and are relatively immobile in the stream substrates, good water quality is essential for rearing.	Present	Known to be present in the Smith River in vicinity of the bridge.
coastal cutthroat trout *Oncorhynchus clarkii*	--	SSC	Prefers small, low gradient gravelly coastal streams and estuarine habitats, including lagoons with cool, clean water and ample cover with deep pools for holding in summer.	Present	Known to be present in the Smith River.
steelhead (Klamath Mountains Province Evolutionary Significant Unit [ESU], summer-run) *Oncorhynchus mykiss irideus*	--	SSC	Occurs in Pacific coast streams with loose gravels at pool tail-outs with cool clear water.	Present	Known to be present in the Smith River.
Invertebrates					
Fort Dick Limnephilus caddisfly *Limnephilus atercus*	--	S1	Caddisflies live in lentic waters both permanent and seasonal, where there is stationary or relatively still water.	Absent	The only known occurrence of the species in Del Norte County is a single male found near Fort Dick in 1963. Lentic waters in the BSA are small in size and in close proximity to roads, structures, and cleared land, making them unsuitable habitat for this species.
Western pearlshell mussel *Margaritifera falcata*	--	S1S2	California, Oregon, Washington, Alaska, Nevada, Utah, Idaho, Montana, Wyoming and British Columbia.	Present	Present near the south bank of Smith River under the bridge.

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale
	Federal	State			
Mardon skipper *Polites mardon*	--	S1	Grasslands and meadows in openings within forests or woodlands.	Absent	There is a 1979 record for this species 3.5 miles northwest of the BSA. The only meadow habitat in the BSA is regularly mowed and used as a field for recreation and sporting events; thus, it is unlikely Mardon skipper would be present.

[1] **Status explanations:**
MBTA = Migratory Bird Treaty Act
MMPA = Marine Mammal Protection Act
FP = designated as a fully protected species under the CFGC
SSC = State species of special concern
S1 = Critically Imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
S2 = Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
SOC = federal species of concern. This is an informal term that is not defined in the federal Endangered Species Act, but is rather meant to refer to species that are thought to be declining or in need of conservation.

Bats

In California, nine species of bats are considered State Species of Special Concern by CDFW and three additional species are proposed for that status. A majority of rare bats in California either use or are likely to use bridge structures (Erickson et al. 2002). Bats often use bridge cavities for roosting during the day and for bearing and rearing young, typically from February through August. They may also use bridges in winter as hibernacula. Bats forage at night for flying insects and are known to roost in the open on the concrete undersides of bridges to rest during their nighttime foraging events. Night roosts, which are used from approximately sunset to sunrise, are sites where animals congregate to rest and digest their food between foraging bouts. Night roosts also serve as important stopping points during migration and appear to have a social function.

Most bridges have expansion joints, which separate sections of the structure and are designed to relieve stress due to compression and expansion. Expansion joints can be used by bats for day and maternity roosts because they can retain heat as well as offer protection from predators. Maternity roosts are typically found in habitat features that are very warm and thermally stable due to the high temperatures needed to rear young (Johnston et al. 2004). Spaces in bridges near the deck or south facing structures with thermal mass may satisfy these requirements.

The project location is within the range of Yuma myotis (*Myotis yumanensis*) and silver-haired bat (*Lasionycteris noctivagans*). Yuma myotis commonly roosts on bridges and is closely associated with open water habitats. Silver-haired bat is considered to be a solitary, tree-roosting species, and is often found in forests. Both catch insects while in flight. Other more common species of bats could also use the bridge as a night roost.

The following portions of the existing bridge were reviewed and eliminated as potential roosting habitat:

- Utilities under the structure—Openings are too large. Day roosting bats prefer crevices or small spaces, and the locations where utilities go through piers are large openings and not conducive to supporting day or maternity roosts.
- Horizontal openings—While there are some horizontal openings, they were excluded as being too wide and guano would buildup, preventing extended use. No guano was observed under the horizontal crevices, and none was observed inside the crevices where visible. If bats, were using the crevices, guano would be visible on vegetation under the crevices.

- Existing bridge is an open steel girder design and does not provided needed small crevices or protection from the elements. Steel open girder designs do not provide protection from temperature changes or predators.

Evidence of bat night roosting (guano and urine staining) was observed on the underside of the bridge on vertical portions of piers near the underside of the deck. Based on the small amount of guano and staining observed, the existing structure provides night roosting habitat used only by a small number of bats. These areas are open to the elements; therefore, they are unlikely to be used for day or maternity roosts. The existing structure does not have internal cavities. Examination of the underside of the bridge expansion joints revealed that the visible joints have deteriorated and are open to the elements at the top of the structure. Day light was visible at the top of the expansion joints and cobwebs were visible throughout the lengths of the joints.

An expansion joint in a section of the existing bridge that is over water could not be closely inspected from below due to accessibility; however, it has been examined using binoculars from the river banks and its condition is likely identical to the other joints given the age and design of the bridge. An emergency survey was conducted on June 18, 2019 for this joint. No bats were observed exiting the joint. The other joints were reexamined for use during the same survey. Caltrans is currently confident that all of the expansion joints are unlikely to be used as day roosts or maternity roosts.

Ringtail

Ringtail is a widely distributed small mammal in California and is designated as fully protected by the state. This species is found in brushy and wooded areas in riparian, chaparral, scrub, oak woodlands, and rocky hillsides. Denning usually takes place among large boulders near canyon bottoms and in hollow trees with tree cavities of 3 inches in diameter or greater. Ringtail is very transient and tends to move through its home range from refuge site to refuge site, and typically stays at one refuge site for only a few days before moving on (Zeiner et al. 1990).

No ringtails or their sign were observed in the BSA during surveys. Suitable foraging habitat for this species is present in riparian habitat in the BSA. Forage that is present includes berries from berry producing vegetation, insects, and small vertebrate prey such as mice or lizards. This species is nocturnal and very difficult to observe during the day and would not likely be detected during daytime surveys. Ringtail would be unlikely to den in the BSA due to lack of appropriate denning habitat, as well as existing noise and disturbance in the area.

Marine Mammals

Pacific harbor seals (harbor seals) and California sea lions (sea lions) are protected under the Marine Mammal Protection Act (MMPA), under which it is illegal to "take" a marine mammal without prior authorization from NMFS. The MMPA (16 USC 1362) defines "take" as "to harass, hunt, capture, kill, or attempt to harass, hunt, capture, or kill any marine mammal." Harassment is defined as any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal in the wild or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding, or sheltering.

Harbor seals are present year-round in the Smith River, particularly in the estuary, with peak haul-out abundance in the summer (NMFS 2017). Individuals have been observed within the project area, approximately 7 miles upstream of the river's mouth, during the winter and occasionally during the summer (Garwood pers. comm.). Sea lions are observed less frequently in the river than harbor seals. Sightings of sea lions are primarily in the fall through spring. Although sea lions are infrequent visitors to the Smith River, it is possible that individuals could range upstream to the project site. There are no known haul-out areas for either species within the vicinity of the bridge.

Migratory Birds and Raptors

The BSA supports potential nesting, foraging, and roosting habitat for special-status birds, migratory birds, and raptors. The occupied nests and eggs of these birds are protected by federal and state laws, including the MBTA and CFGC Sections 3503 and 3503.5. The breeding season for most birds and raptors within the project region is generally from February 1 to September 15. Special-status birds, including white-tail kite and northern harrier, could also forage, roost, or pass through the BSA.

Migratory birds are known to be present in and near the BSA, including cliff swallows (*Petrochelidon pyrrhonota*) that build mud nests on the bridge. Other bird species may nest in riparian trees and shrubs around the bridge. The habitat value of the vegetation communities is reduced due to fragmentation from proximity to roads, a gravel mining operation, residences, and agriculture. There are no records for raptor nests in the BSA; however suitable foraging and nesting habitat is present.

Amphibians and Reptiles

Western pond turtle, Pacific tailed frog, Del Norte salamander, and northern red-legged frog could potentially occur at the project site. Western pond turtle (pond turtle) is a CDFW

Species of Special Concern that prefers creeks and ponds with quiet water, as well as streams with boulders or fallen trees that provide cover. The species is often associated with areas that provide basking habitat such as aquatic vegetation and/or logs.

Pacific tailed frog (tailed frog) is a CDFW Species of Special Concern that occurs in mature or late-successional conifer-dominated habitats, including coast redwood and Douglas-fir forests. It can be found in cool, perennial streams with steep banks and dense vegetation. Tailed frogs are usually found in streams with large stones, cobbles, and stable boulders, which can be used for shelter from rapid current. Quieter side pools are also needed so eggs are not washed away.

The Del Norte salamander (a CDFW Species of Special Concern) is found in Del Norte, Siskiyou, and Humboldt counties. This species can be found year-round in montane hardwood-conifer, Douglas-fir, and redwood forest habitats ranging from lower elevations up to about 4,000 feet. Del Norte salamanders are typically found under rotting logs and slabs of bark in cool, moist sites that have a deep litter layer, closed multi-storied canopy, and are dominated by large, old trees. They lay eggs in moist soil and do not require standing water for breeding.

The northern red-legged frog is a CDFW Species of Special Concern. It is a medium to large sized frog that is found in humid forests, woodlands, grasslands, and streamsides with dense riparian cover. It is most common in lowlands or foothills and is frequently found in woods adjacent to streams, but can be wide-ranging and highly terrestrial in damp woods and meadows during the non-breeding season. It requires permanent water sources such as ponds and lakes for breeding.

Western pond turtle, tailed frogs, and Del Norte salamander were not observed at the project site during any field studies. Northern red-legged frogs were observed in 2017 perching on a log within the ponded area northwest of the bridge. This area and nearby streams northwest of the bridge represent the only potential habitat at the project site for northern red-legged frog, western pond turtle, and tailed frog, although the habitat value of this pond is marginal due to its small size and proximity to roads, structures, and cleared land. This area is only marginally suitable for tailed frogs because the redwood vegetation type occurs only as narrow bands of habitat on either side of the highway, and the two perennial streams within the BSA (one east and one west of the highway) are located in riparian communities and not the species’ preferred coniferous forests. The habitat value of these streams is also low because they lack steep banks, cobble streambeds, dense vegetation, and side pools.

The redwood forest at the project does not provide the habitat features preferred by the Del Norte salamander, as the forest is not dominated by large, mature trees and a multi-storied canopy with deep litter. In addition, the narrow bands of redwood on either side of US 101 are exposed to sunlight, thereby reducing the potential for damp areas for Del Norte salamander to be found. However, this species cannot be entirely ruled out.

Special-status Fish

The Smith River contains potential habitat for green sturgeon, Pacific lamprey, coastal cutthroat trout, and steelhead. Green sturgeons are anadromous fish that spend the majority of their lives in nearshore oceanic waters, bays, and estuaries (NMFS 2015). The species is classified into two Distinct Population Segments (DPS). The southern DPS spawns in the Sacramento River and is listed as federally threatened. Spawning populations of the northern DPS, which is a federal Species of Concern, occur in the Klamath and Rogue rivers. The status of green sturgeon in the Smith River, which is within the boundaries of the northern DPS, is not well established. Although spawning occurs in fresh water and adult green sturgeon are known to occasionally enter the Smith River (presumably to feed), the species is not known to spawn in the river. The northern DPS of green sturgeon is a CDFW Species of Special Concern.

Pacific lamprey is a CDFW Species of Special Concern and USFWS Species of Concern. Pacific lampreys are parasitic anadromous fish native to the Pacific coast of North America and Asia. Abundance estimates for Pacific lamprey populations in California are scarce. As adults in the ocean, Pacific lampreys are parasitic and feed on the body fluids and blood of marine fish. After spending one to three years in the marine environment, they stop feeding and migrate back to fresh water between February and June. They overwinter in fresh water until they spawn the following year between March and July (CalFish 2017). Pacific lamprey ammocoetes (the larval stage) start life under gravel in freshwater streams. After a few weeks they emerge, usually at night, and drift downstream until they find a low velocity backwater filled with silt or mud where they burrow and live as filter feeders for up to seven years. Metamorphosis to macrophthalmia (juvenile phase) occurs gradually over several months from July to November. During this transformation, they develop eyes and teeth. Macrophthalmia begin their downstream migration in late summer-early fall when rains increase stream flows that passively carry fish to main stem rivers and eventually the ocean.

Coastal California cutthroat is a CDFW California Species of Concern. Of the 13 subspecies of cutthroat trout indigenous to North America, only the coastal cutthroat is anadromous. Coastal cutthroat have complex life histories and not all are anadromous. In any given body of water, some may migrate to sea while others become resident fish. Sea-run cutthroat spawn over a long period, from winter through late spring. They generally seek smaller streams where the flow is minimal, and the substrate is small, almost sand. They prefer the uppermost portions of these streams; areas that are too shallow for other salmonids.

The steelhead trout Klamath Mountains Province ESU is an anadromous fish species that spawns in tributaries to the Smith River and appears to be in long-term decline. This ESU includes all naturally spawned populations of steelhead (and their progeny) in coastal river basins ranging from the Elk River in Curry County, Oregon, to the Klamath River, inclusive, in Del Norte County, California. Two basic reproductive strategies have been identified for steelhead: ocean-maturing and stream-maturing. Ocean-maturing steelhead (winter steelhead, also referred to as winter-run) enter fresh water with well-developed gonads and spawn relatively soon thereafter, while stream-maturing steelhead (summer steelhead, also referred to as summer-run) enter fresh water with immature gonads and require several months to mature and then spawn. Summer-run steelhead are a CDFW Species of Special Concern.

Western Pearlshell Mussel

The western pearlshell mussel is identified by CDFW as S1S2 in California (ranked between “imperiled” and “critically imperiled”) and G4G5 (globally ranked between “apparently secure” and “secure”) (CDFW 2019). The species does not have a legal status under federal or state law, is not listed under the Federal or California Endangered Species Act, and is not considered a Species of Special Concern by CDFW, although handling or take is protected under state Scientific Collecting Permit requirements for certain purposes. The species is also identified as a “species of greatest conservation need” in the 2015 California State Wildlife Action Plan (CDFW 2015).

A 2016 analysis showed that western pearlshell mussel distribution has declined range-wide by 17 percent from historic distribution (prior to 1990) (Blevins et al. 2016, 2017a). Data from that assessment also indicate the species has declined by 22.5 percent in California. Extirpation risk has not been assessed for populations of western pearlshell mussels in the Smith River watershed.

Western pearlshell mussels are bivalve mollusks that inhabit the substrate of perennial creeks and rivers with clean water at depths generally of 1.5 to 5.0 feet. The mussels are filter feeders that consume plankton, algae, and bacteria suspended in the water column. The species requires stable substrates with low shear stress, gradient, and water velocities. They are often in eddies (flatwater and backwater stream environments) and areas with cobble and boulders that protect the animals from high flows and scour events (Jepsen et al. 2012). Consistent with this, mussel populations observed in the Smith River in 2017 and 2018, were primarily in eddies with cobble and boulders, with sand being the burrowing medium between the larger substrates. However, the population at the bridge occurs in run habitat, also consisting of sand mixed with cobble downstream of abandoned bridge piles located upstream of the existing bridge.

Freshwater mussels, including western pearlshell mussels, require a fish host to reproduce. Female mussels filter sperm that is broadcast into the water column by males, but hermaphroditism is also observed in the western pearlshell mussel (Heard 1970). Eggs incubate and are released as glochidia into the water column, where they must encyst in the tissue of host fish, primarily salmonids, to complete development. The Smith River watershed has several salmonid species that could serve as host fish for western pearlshell mussels including Chinook salmon, coho salmon, steelhead trout, and cutthroat trout. After metamorphosis, the mussels drop from the host fish to the substrate. The timing of reproductive activity (spawning and glochidial release) is affected by water temperature (Haley et al. 2007). Spawning is generally reported between April and July and at temperatures exceeding 7.2ºC to 10ºC in California rivers. Glochidial encystment may last 36 days, between April and July (Haley et al. 2007). Western pearlshell mussels are long-lived, commonly reaching ages of 30 to 40 years, with maximum lifespans of 100 or more years (Howard and Cuffey 2006, Allard et al. 2015, Toy 1998). Sexual maturity may not occur until at least 9 to 12 years of age, but possibly as late as 45 years in some populations (Toy 1998, Allard et al. 2015).

Surveys conducted by CDFW and USFWS biologists in 2011 and 2012, found an extensive western pearlshell mussel bed, i.e., a site with single or few mussels or larger groups, in sandy/cobble substrate along the south bank of the Smith River under the Dr. Fine Bridge. At the bridge site, individual mussels ranged in size from approximately 4 to 12 centimeters long, indicating strong recruitment and long-term population persistence at this site. While the species is distributed throughout the lower Smith River, the population near the bridge is likely the largest in the river (Garwood pers. comm.).

An additional survey was completed by two aquatic biologists, Emily Blevins, Xerces Society, and Adam Wagschal, ICF, on August 10, 2016, during low flow (about 280 cfs per Smith River USGS gauge 11532500) and under relatively clear water conditions. The purpose of the survey was to map mussel locations and estimate surficial mussel density to better evaluate the potential for impacts on the mussel bed at the project site. Details of the population modeling are provided in the Western Pearlshell Mussel Impact Assessment (Caltrans 2019j).

On November 13, 2018, Emilie Blevins and Adam Wagschal revisited the Dr. Fine Bridge Site. During this visit, western pearlshell mussels were informally observed and sampled with the purpose of determining whether conditions had obviously changed since the 2016 surveys. Water was relatively clear and the temperature was 9.5 °C. Flow was approximately 210 cfs according to the Smith River USGS gage 11532500. Based on the 2018 project site resurvey, the previously delineated mussel bed boundary and associated habitat has remained essentially unchanged since the 2016 survey (Caltrans 2019j). An assessment of population density based on visual snorkel surveys was not possible at this time, however, as mussels were obviously burrowed more deeply than during warmer summer months. When mussels are burrowed more deeply, quadrat samples and timed counts generally result in relatively large underestimates of true density and abundance.

The area inhabited by mussels is approximately 16,221 sq. ft. (0.37 acre) and is confined to the south side of the river, beginning at the second (southern) of two abandoned bridge piles upstream of the bridge and continuing approximately 200 feet downstream of the bridge. Measuring from the closest existing in-water pier toward the southern shoreline, the mussel bed is 83 feet from the pier and extends approximately 120 feet, nearly to the south shore, as observed at summer low flow (Figure 2-27).

During low flow conditions, mussels are located in water depths ranging from 1.5 to 6 feet. Existing recreational access by swimmers and fishermen is evident along the south bank under the bridge. Western pearlshell mussels were not observed immediately adjacent to the shore in the unvegetated access area, although they were found both upstream and downstream of this point nearer to the bank where shoreline vegetation was intact. The habitat in which the western pearlshell mussel population is located is a run with substrate consisting of a mix of sand and cobble. The stable habitat that has formed to support the mussels appears to be a result of an abandoned upstream bridge pile, which likely slows the current and creates conditions that protect the existing substrate and the mussel bed during high flows. Upstream surveys at known western pearlshell mussel populations indicate that this is relatively unique habitat in the mainstem Smith River. Western pearlshell mussels of various sizes were observed, suggesting that reproduction has occurred at the site in the past. The occurrence of juvenile mussels, which may be within the substrate and not visible without excavation, could not be determined.

Transects and plots were placed across the full length and breadth of the observed occupied mussel habitat (16,221 sq. ft.). Individual mussels were counted within an 88.8 sq. ft. sample area, where there was an average mussel density of 0.59 mussel/ft^2. Note, however, that counts of mussels are considered incomplete because some mussels are presumed to be almost entirely buried and not visible. A more accurate survey would require excavation of the substrate (Smith et al. 1999). Based on estimates of mussel density during a recent western pearlshell salvage and relocation effort, the density of mussels could reasonably be 30–70 percent higher (Nemeth et al. 2019) than calculated. Based on these ranges, the ranges in population size are estimated as 9,570 (estimate of surface-count only), 12,441 (estimate plus 30% buried), and 16,269 (estimate plus 70% buried) western pearlshell mussel individuals in the project site (Caltrans 2019j).

Within the densest portion of the bed (an area of 9,041 sq. ft. directly under the existing bridge on the south side), more than 2,100 western pearlshell mussels were observed. As indicated above, this total is incomplete because it does not account for mussels that were not visible. Within this area, the average density was calculated at 0.23 mussel per sq. ft.; however, mussels were observed in clumped distributions, with areas of density as high as 30 or more mussels per 2.69 sq. ft. quadrat. Based on the total area of plots measured in this area (16.15 sq. ft.), the average density was calculated at 1.61 mussels per sq. ft. For comparison, average mussel density determined from transects in Mill Creek, a nearby upstream tributary of the Smith River, has been calculated between 0.42 and 3.92 mussels/ft^2 (Bensen 2010)

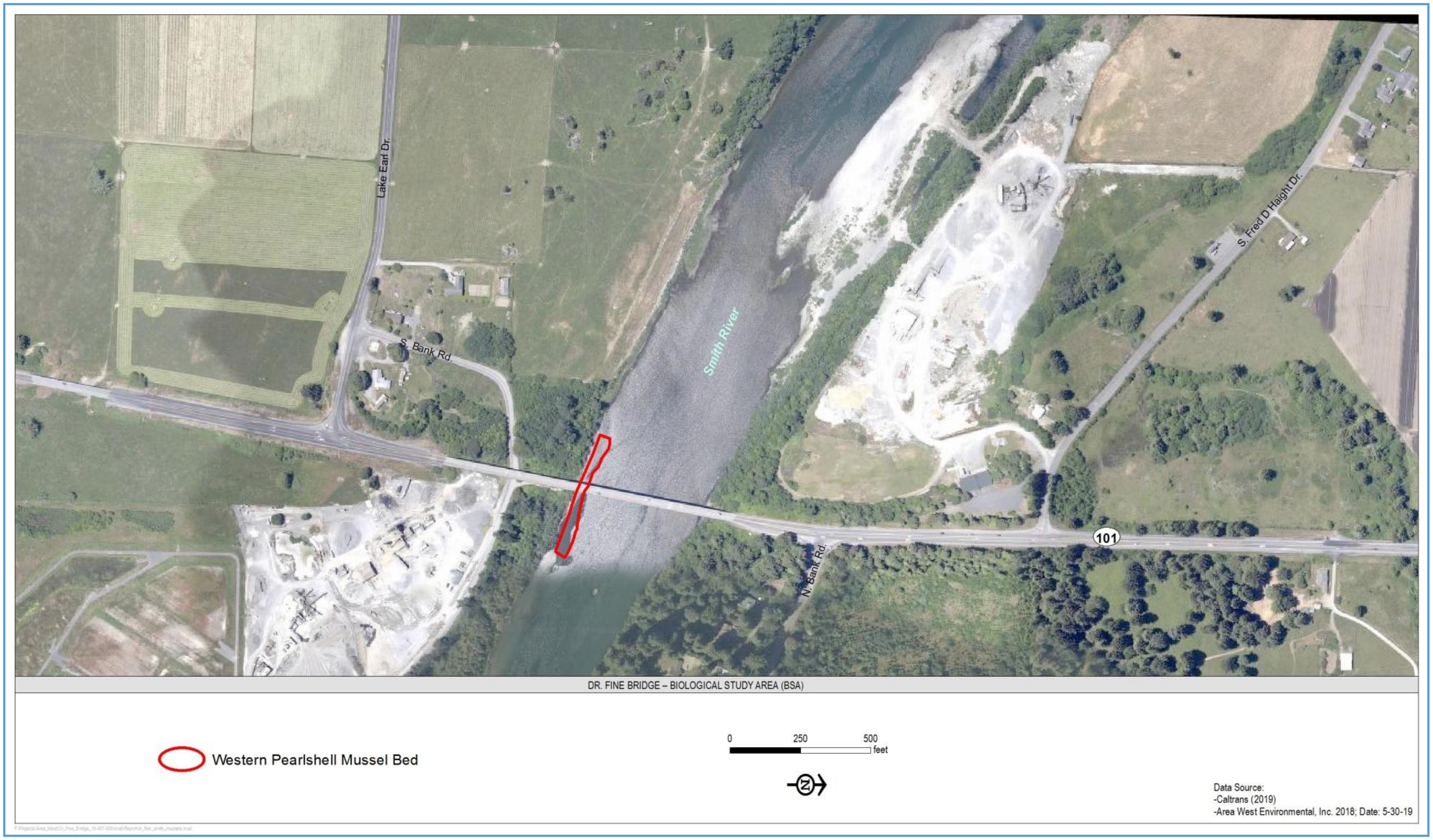


Figure 2-27. Western Pearlshell Mussel Location

2.3.3.3 Environmental Consequences

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

Build Alternatives

Bats

Under all build alternatives, the project has low potential to affect maternity or day roosting habitat. The potential for impacts would be further reduced through implementation of *Project Features, Standard Measures, and Best Management Practices,* which includes roosting bat protection measures. The project could temporarily displace suitable night roosting habitat for bats and inhibit foraging during active construction. However, if disturbed, night roosting bats could readily relocate given their mobility. Bats can use a variety of structures, including bridges and trees, as night roosts, day roosts, and maternity roosts. However, night roosts are simply places bats can temporarily rest at and process food between foraging flights. Night roosts are often found on bridges over water because of their proximity to foraging habitat; many bat species forage over open water because of the abundance of flying insects and lack of obstacles. In addition to the bridge, trees on either side of the river and nearby buildings are potential night roosts. Areas up and downstream of the bridge and nearby agricultural fields with flying insects provide foraging habitat.

Under all build alternatives, the project is expected to have minimal effect on bats from the temporary loss and/or alteration of existing night roosts and foraging habitat. The existing bridge will likely continue to serve as night roost habitat during construction until the bridge is demolished. The new bridge would provide similar roosting habitat, and therefore likely replace the existing night roost habitat.

Under all build alternatives, construction activities that extend beyond sunset may temporarily deter bats from foraging near the bridge. Nighttime lighting during construction could disrupt bat activity by affecting their foraging behavior and the behavior of their prey. Lights can attract prey for bats which can be beneficial for foraging. Standard measures for lighting will minimize disturbance to bats. Additionally, adjacent areas provide suitable habitat for night roosts and foraging.

Ringtail

Under all build alternatives, soil disturbance and removal of vegetation could indirectly affect ringtail, if present. However, ringtails typically forage after sunset and therefore would not be foraging in or near the project during daylight hours when these activities would occur. All alternatives include the removal of mature trees and riparian vegetation that could represent potential foraging or cover habitat for ringtail. However, under all build alternatives, the project is expected to have minimal effect on ringtail from the temporary loss and/or alteration of existing foraging habitat. Although construction activities that extend beyond sunset may temporarily deter ringtail from foraging near the bridge, adjacent areas would continue to provide suitable habitat for foraging.

Marine Mammals

NMFS has determined that impulsive hammering sounds (e.g., pile driving) can have a detrimental effect on marine mammals by causing stress, interfering with communications and predator/prey detection, and changing behavior. More significantly, acoustic overexposure to such loud sounds can lead to temporary or permanent loss of hearing. NMFS is in the process of determining safety criteria for marine species exposed to underwater sound, including impulsive sound. Under all build alternatives, pile driving activities have the potential to harass harbor seals and sea lions that may be swimming and/or foraging in the project vicinity. Any short-term exposure to impulsive sound or construction noise may result in a temporary reduction in utilization of foraging areas for marine mammals.

Harbor seal and sea lion individuals could swim upstream in the Smith River while seeking salmonid prey. If present in the project vicinity, they could be exposed to impulsive sound or construction noise from the project. Visual effects from increased human presence, as well as changes in water quality, could also affect the species. Potential effects would be avoided and minimized through implementation of *Project Features, Standard Measures, and Best Management Practices*, which include measures for marine mammal protection.

Construction activities are not expected to have a substantial effect on individuals of these species because neither species is a common visitor to the project area, especially because the reach of the river that includes the bridge site does not provide haul-out areas. These species are highly mobile and could leave the area if disturbed. Additionally, changes in turbidity during construction would be closely monitored, and potential effects are expected to be localized. None of the potential effects are believed to be biologically significant to the survival and reproduction of marine mammals and their habitat near the proposed project.

A detailed summary of pile driving requirements and potential hydroacoustic effects for each build alternative is provided for coho salmon in Section 2.3.4, *Threatened and Endangered Species*.

Since harbor seals are found year-round in the Smith River, there is a higher potential that this species would be affected by noise and visual disturbance resulting from the project compared to sea lions, which are absent during the summer. Impacts on harbor seals and sea lions from each of the three build alternatives would be similar, if present.

Migratory Birds and Raptors

Under all build alternatives, direct effects on nesting birds would be minimized by avoiding vegetation removal during the avian nesting season. Additionally, as described in *Project Features, Standard Measures, and Best Management Practices,* nesting bird and raptor surveys would be completed prior to the initiation of project activities during the avian nesting season, and non-disturbance buffers would be established around active nests.

The existing bridge structure would be available for swallow nesting until the bridge is demolished. Prior to demolition, birds would be restricted from nesting on the existing bridge by use of exclusionary devices and/or the removal and disposal of partially constructed and unoccupied nests within the construction area on a regular basis throughout the bird breeding season to prevent their occupation. Swallows are widespread throughout the region and, once the structure is demolished, would presumably find other sheltered sites with a vertical surface. Post-construction, the new bridge under all build alternatives would provide a comparable swallow nesting habitat to the existing bridge.

While all build alternatives will have temporary and permanent impacts on potential nesting, foraging, or roosting habitat, many of these habitats already exist in a degraded condition, and project impacts would be avoided and minimized to the maximum degree possible. Alternatives 1 and 2 will realign the existing highway and bridge to the west, resulting in a larger overall footprint than Alternative 3. Under Alternatives 1 and 2, slightly more permanent and temporary impacts on natural communities would occur than under Alternative 3. Impacts on the birds due to a temporary loss of nesting, foraging, or roosting habitat resulting from project construction and vegetation removal would be negligible given the availability of suitable habitat elsewhere within the immediate area.

Amphibians and Reptiles

Under all build alternatives, effects on amphibians and reptiles, including western pond turtle, tailed frog, Del Norte salamander, and northern red-legged frog, could result from habitat modifications and direct mortality. Under all build alternatives, *Project Features, Standard Measures, and Best Management Practices* that cover aquatic species relocation would minimize the chance amphibian and reptile individuals would be directly affected by project construction. A qualified biologist would be present at the start of all in-stream construction activities to survey and relocate individuals to suitable habitat outside the construction zones.

Pond and stream areas northwest of the bridge represent potential habitat for frogs and turtles. The ponded area northwest of the bridge would be protected as an ESA under all build alternatives. Under Alternatives 1 and 2, the temporary impacts would extend to within 5 feet surrounding this pond. Alternative 3, however, would allow a larger area around the pond to be avoided and protected. Alternatives 1 and 2 would have 0.115 acre of temporary impacts and 0.001 acre of permanent impacts on stream habitat. Alternative 3 would have 0.063 acre of temporary impacts and no permanent impacts on stream habitat.

The proposed project would not have a substantial effect on western pond turtle, tailed frog, Del Norte salamander, and northern red-legged frog given the minimal habitat in the BSA, the temporary nature of construction, and the abundance of suitable habitat in the project vicinity to which individuals could relocate, or be relocated to, if necessary.

Special-status Fish

Under all build alternatives, special-status fish, including green sturgeon, Pacific lamprey, coastal cutthroat trout, and steelhead, if present, could be affected by potential water quality changes, noise and visual disturbance, fish passage, hydroacoustic impacts, and direct injury resulting from project construction, as described in detail for coho salmon in Section 2.3.4, *Threatened and Endangered Species*.

The project includes Project Features, Standard Measures, and Best Management Practices that cover aquatic species relocation and hydroacoustic monitoring to avoid and minimize project effects where feasible. Under all build alternatives, the in-water work season would be limited to June 15th to October 15th, avoiding the most vulnerable life stages of sensitive fish species that occur within the Smith River.

Pacific lamprey ammocoetes spend most of their time burrowed in stream substrates, making them particularly susceptible to activities that involve excavation, stranding (due to dewatering), or accidental contaminant spills, potentially affecting many different age classes that tend to concentrate in the same areas due to habitat preference (USFWS 2010). Under all build alternatives, adult and young Pacific lamprey could be caught within cofferdams utilized during dewatering of work areas. Because lamprey ammocoetes may not emerge from dewatered substrates until they begin to desiccate, which often occurs at night after other fish salvage operations have ceased, dewatering and relocation efforts for lamprey would be performed in accordance with *Best Management Practices to Minimize Adverse Effects to Pacific Lamprey* (*Entosphenus tridentatus*) (USFWS 2010).

Contaminants from accidental spills could affect water quality and aquatic habitat for special-status and common fish species. This could also harm or kill lamprey ammocoetes, which are thought to have a higher propensity for accumulating toxins given they spend three to seven years filter feeding. These potential impacts would be avoided and minimized through water quality protection measures included in *Project Features, Standard Measures, and Best Management Practices.*

Western Pearlshell Mussel

Under all build alternatives, project components involving any in-water and ground-disturbing work have the greatest potential to affect western pearlshell mussels. The Western Pearlshell Mussel Impact Assessment (Caltrans 2019j) determined that the species could be affected by construction noise and vibration, changes in water quality and increased turbidity, and changes in river flow velocities and patterns that could dislodge portions of the mussel bed and change water conditions.

Under all build alternatives, impacts on western pearlshell mussels could occur as a result of one or more of the following:

- ***Increased velocity and shear stress caused by temporary gravel berms*** – potential dislodgement of mussels due to increased summer flow around gravel berms.
- ***Habitat loss from shear stress caused by temporary piles and gravel berms*** – potential erosion of a portion of the mussel bed beneath Dr. Fine Bridge caused by in-water elements.
- ***Habitat loss from scour around bridge piers*** – potential scouring around trestle piles eroding mussel beds or dislodging individuals.
- ***Pile driving and demolition noise and vibration*** – potential dislodgement of mussels or cobbles or burying by transported sediments.
- ***Direct injury*** – potential injury during pile driving, demolition, and dewatering cofferdams during pier construction.
- ***Debris racking*** – potential dislodgement and shear stress created by woody debris racking on in-water trestle piles.
- ***Relocation risks*** – potential mortality of relocated mussels.

Increased Velocity and Shear Stress Caused by Temporary Gravel Berms

Under all build alternatives, in-water construction activities would require temporary construction and demolition gravel berms across approximately 80 percent of the river and temporary construction trestles and falsework supported on piles spanning the mussel bed. Constriction of the flow resulting from gravel berms would result in increased flow velocities through the open channel and over the mussel bed. Hydraulic modeling and scour analyses performed by Caltrans to evaluate potential hydraulic and geomorphic effects of the temporary and permanent structures under all build alternatives to aquatic habitat predict localized increases in water velocities and shear stress adjacent to the mussel bed (Caltrans 2019m, 2019j).

Under all three build alternatives, water velocities through the low-flow channel in the summer would change due to gravel berm constriction of flow. Review of the scour model outputs (Caltrans 2019j: Appendix B), indicate that under the summer low flow, regardless of alternative, the presence of gravel berms increase velocity and scour above the approximate maximum values experienced within the mussel bed under existing conditions in the same season, appearing to concentrate the flow of water directly into the mussel bed. For both velocity and shear stress, these values approximate tens to hundreds, or in one case (Alternative 1, Summer Low, Demolition) several thousand percent increases in portions of the mussel bed over the existing condition maximums. Increases in velocity over winter conditions, though less extreme, are also evident.

Observations of western pearlshell mussels at the project site suggest that increased velocity and shear stress in summer months have the potential to negatively affect mussels. Although flow velocity and shear stress are naturally higher at the mussel bed during winter months, freshwater mussels adapt to winter conditions of higher flows and colder temperatures, in part, by burrowing farther into the substrate (Balfour and Smock 1995, Amyot and Downing 1997, Perles et al. 2003, Haley et al. 2007). If higher flows occur at the mussel bed during the in-water work period, when mussels are actively feeding and reproducing, mussels may be more easily dislodged than during periods when they typically experience higher flows. In addition, increased river velocities can inhibit reproduction and growth rates of juveniles transported downstream to unsuitable habitat (Black et al. 2015). Therefore, direct mortality of mussels is expected.

Habitat Loss from Shear Stress Caused by Temporary Piles and Gravel Berms

Scour model results suggest that increased construction-related shear stress presents some risk toward the erosion of cobble substrate in the western pearlshell mussel habitat under summer high flows (Caltrans 2019m). Using what is likely to be the most common hydraulics reference, Open Channel Hydraulics (Chow 1959), for streambed of uniform-sized material a shear stress of 0.90 pounds per square foot (lbs. per sq. ft.) will initiate movement of a 2.2-inch rock, 1.1 lbs. per sq. ft. will initiate movement of a 2.7-inch rock, and 1.2 lbs. per sq. ft. will begin moving the largest gravel-sized pieces but not quite small cobble. Summer demolition scenarios for Alternatives 1 through 3 exceed both typical winter shear stress (existing winter 2-year flows = 0.98 lbs. per sq. ft.) and the above thresholds for movement of substrate.

Although the maximum shear stress experienced during demolition in summer high flows (1.2 lbs. per sq. ft.) presents model conditions above typical winter shear-stress conditions where cobble may begin to move, the shear stress over 95 percent of the mussel bed would not move rocks above 2.7 inches under the worst-case modeled summer demolition conditions (e.g., 95th percentile = 1.08 lbs. per sq. ft.; Caltrans 2019m). Therefore, the mussel bed habitat is not likely to experience shear stress markedly different from winter high flow events.

The stability of the existing mussel bed through time is uncertain, and although, shear stress and velocities under existing winter 10-year modeled flows are much higher than any modeled construction-related conditions (Caltrans 2019m), this flow (151,000 cfs) has not been recorded at the Dr. Fine Bridge site since 1972 (USGS 2019). Therefore, without knowing the age of the mussel bed at this location, the potential effects of a 10-year winter flow event cannot be determined.

During the construction period, the mussel bed may also be affected by the presence of temporary trestle piles that would remain in the river through the winter-spring seasons under all build alternatives. To understand how the effects observed in scour model outputs relate to effects of the gravel berm, piers, or both, velocity and shear-stress values were examined from temporary piles along south-westerly oriented transects (Caltrans 2019j). In common to all alternatives, the summer low flow velocity and shear stress are modeled as increased above the maximum values experienced within the mussel bed under existing conditions in the same season along the transects. Shear stress as measured along these transects, however, is much lower during the summer low flow than modeled for the existing 2-year flow, suggesting that the high shear-stress values do not occur along the transects extending from piles (Caltrans 2019j). As a result, the increased shear stress observed within the mussel bed is likely a function of the gravel berms altering flow across the piles.

Habitat Loss from Scour around Bridge Piers

Scour model results indicate winter flow scour hole diameters of the upstream construction trestle pile, the pile experiencing the least shielding in the bent, ranging from approximately13 feet to 38 feet from temporary piles, depending on the alternative, flow, and method of calculation. A review of pier scour equations for coarse bed streams (Chase and Holnbeck 2004) found that the Simplified Chinese Equation more accurately predicts actual scour depth and is very sensitive to changes in velocity; whereas, the values produced by the HEC-18 Equations are considered more appropriate for conservatively designing pier foundations. As a result, the Simplified Chinese Equations could be considered more appropriate for the purposes of this analysis. As shown in Tables 6 through 8, which are taken from the updated Scour Memo (Caltrans 2019m), predicted scour depths and estimated scour-hole diameters are summarized for both the HEC-18 Equations for local pier scour and the more appropriate Simplified Chinese Equation. Under 2-year flows, the Simplified Chinese Equation predicts scour holes around 13.3 to 14.5 feet at the upstream construction pile, which is over 30 feet from the mussel bed.

The bridge design also includes placement of permanent piers in-water and on the south bank straddling OHWM elevation. In Alternatives 1 and 3, this includes Pier 3 on the south bank and Pier 4 in-water. In Alternative 2, this includes Pier 4 on the south bank and Piers 5 and 6 in-water. Review of the scour model outputs indicate that adverse effects on mussels from the in-water piers are not anticipated. If the south bank pier occurs at or below the OHWM, and if pier scour is expected to extend the same diameter as determined for temporary piles, then there is greater potential for local scour to extend into the area of the mussel bed. If final placement of the south bank pier results in local scour of the mussel bed, then adverse effects can be anticipated, such as dislodgement of mussels and/or a direct loss of burrowing substrate, including fine sediments and associated cobble.

Removal of vegetation from the area in which piles and the aforementioned pier would be constructed also has the potential to increase erosion. Mussels are sensitive to sedimentation and burial and could be adversely affected by any erosion and transport of sediment resulting from clearing and grubbing. Standard temporary construction BMPs, such as fiber rolls, address the potential for sediment transport even if roots are disturbed. The project would also be regulated by the State Water Resources Control Board Construction General Permit, which requires minimization of erosion and turbidity.

Pile Driving and Demolition Noise and Vibration

Under all build alternatives pile installation is expected to include a combination of vibratory and impact installation methods, which would result in vibrations to both riverbed substrate and ambient water. During surveys, some mussels were observed to be loosely embedded within the substrate. When surveyors fanned the substrate to clear loose sand so that mussels could be counted, some mussels were easily dislodged from their upright, filtering position. If vibration from pile installation disturbs cobbles, finer sediment, or mussels within occupied habitat, mussels may be adversely affected by dislodgement one or more times; direct loss of burrowing substrate; burial via downstream transport of sediment; or increased turbidity.

The western pearlshell mussel is sensitive to dislodgement, sedimentation, and increased turbidity, although the species is somewhat mobile and mussels have the ability to reposition themselves using their muscular foot. While the species is capable of movement, individuals do not appear to move frequently, and the rate of movement can be quite slow (Allard et al. 2015). Additionally, dislodged pearlshell mussels have been observed unable to right themselves in cobble habitat elsewhere. A short-term increase in turbidity could have a short-term adverse effect to the population because mussels would close their valves during turbid conditions (Roscoe and Redelings 1964), which would disrupt filtering and feeding. Mussels may also be unable to recover from burial, particularly juvenile mussels that persist in the substrate (Jepsen et al. 2012). Dislodged mussels could also be more vulnerable to predation if they are more visible or become stranded.

Western pearlshell mussels could be directly affected by noise from pile-driving vibrations. Although mussels do not experience sound in the same manner as fish, for which protective thresholds have been developed (Fisheries Hydroacoustic Working Group 2008), avoidance behaviors have been observed in other burrowing bivalves, including razor clams (*Sinonovacula constricta*) in response to sounds of 100 decibels (dB) (Peng et al. 2016), and in the Manila clam *Ruditapes philippinarum)* in response to continuous sounds of 135 dB (Solan et al. 2016).

Because there are very few published studies on how burrowing bivalves respond to noise and vibration it is not possible to fully evaluate the effects of pile-driving sound and vibrations on western pearlshell mussels. However, given the number of piles that are proposed for the temporary construction trestles and falsework, and the proximity of the mussel bed to the piles, there may be adverse effects on the western pearlshell mussel population from this activity. The recommendation below for monitoring of effects and possible relocation of mussels would minimize potential negative effects.

Direct Injury

Activities under all build alternatives, such as pile driving, dewatering during cofferdam installation, and demolition of the existing bridge, including cutting and removal of piles, could affect western pearlshell mussels if vibration disturbed the substrate such that mussels are dislodged. Mussels do not occur close to or directly downstream of existing piers but are present 83 feet south of the existing Pier 10. Demolition activities, such as dewatering inside cofferdams, are restricted to the area immediately surrounding the pier, or the area covered by the gravel berm; therefore, these activities are not expected to directly affect mussels. However, due to the predominance of sand in the area of Pier 10, turbidity could increase during and after demolition activities. The temporary containment system put in place during bridge demolition is to be designed to contain debris and reduce the potential for adverse effects that could result from increases in turbidity associated with demolition.

Construction activities that disturb soil and sediments in stream channels, riparian zones, and floodplains can increase erosion and mobilization of sediments, resulting in increased turbidity and suspended sediment and potential adverse effects on aquatic species and their habitat. Short-term elevated turbidity and suspended sediment could adversely affect the mussel population because mussels would close their valves during turbid conditions (Roscoe and Redelings 1964), which would disrupt filtering and feeding. Mussels may also be unable to recover from burial, particularly juvenile mussels that persist in the substrate (Jepsen et al. 2012).

Localized scour at construction trestle piles (under all alternatives) and at temporary bridge piers (Alternative 3) during peak winter flow events is expected to result in temporary, localized increases in suspended sediment and turbidity during the first series of major flow events. Although the total volume of fine sediment potentially mobilized in any given event is uncertain, the contribution of suspended sediment resulting from scour is expected to be small relative to the total sediment loads in the river during such events. Potential increases in sediment deposition would likely be limited to a single season and affect only a small area of the streambed, resulting in only temporary, localized effects on the mussel bed.

Also, project actions that involve the storage, use, or discharge of toxic and other harmful substances near streams and other water bodies (or in areas that drain to these water bodies) can result in contamination of these water bodies and adverse effects on mussels and other aquatic organisms.

Potential adverse effects of increased turbidity, suspended sediment, and contaminant exposure would be avoided or minimized through implementation of Project Features, Standard Measures, and BMPs.

Debris Racking

As discussed for coho salmon in Section 2.3.4, *Threatened and Endangered Species*, debris racking could occur on structures left in the river. If racking alters stream flows and leads to scouring of western pearlshell mussel habitat, the direct mortality and long-term or permanent loss of mussel habitat is expected. The construction trestle piles are proposed to span the mussel bed, which represents an ESA. The location of the proposed ESA around the mussel bed boundary would determine how close the northern and southern temporary piles would occur to individual mussels. Debris racking is more likely to occur toward the center of the channel than near the banks. Debris that is transported and trapped along in-water structures near the mussel bed has the potential to lead to local scour, which could affect mussels. The risk of potential adverse effects would be lessened with the removal of the gravel berm, falsework piles, and trestle stinger and deck during the winter. Additionally, any racked debris that is removed by the contractor after high-flow events have subsided would not be dragged over the mussel bed ESA.

Potential Impacts from Mussel Relocation

Relocation of mussels is a common mitigation measure when adverse effects are otherwise unavoidable. However, the practice has variable success rates, and avoidance and minimization measures are typically preferable over relocation. For example, Cope and Waller (1995) found that overall survival of relocated mussels was less than 50 percent in a review of 33 freshwater mussel relocation projects. Freshwater mussel research by Hamilton et al. (1997) found that microhabitat is a key variable for predicting survival of relocated mussels, but survival rates varied greatly among species and microhabitats. Additionally, juvenile mussels are generally difficult to find and relocate during surveys.

Survival following relocation of western pearlshell mussels has not been studied in great detail. Adult western pearlshell mussels relocated between rivers in Washington State had 55–95 percent survival after 1 to 3 years (Fernandez 2013). However, a western pearlshell mussel relocation effort in the Upper Truckee River found survival rates of only about 25 percent after 2 years (Howard 2013). Staff at the Lake Tahoe Basin Management Unit of the United States Forest Service are currently studying the success of a relocation project for western pearlshell mussels. The goals of the relocation project are to evaluate factors affecting the success rate of relocations and include recommendations specific to western pearlshell mussel relocations (Gross et al. 2015, Miller pers. comm.).

Conclusion

Western pearlshell aggregations, including sites with single or few mussels or larger groups (mussel beds), have been observed from the area in the Smith Basin in East Fork Mill Creek, West Branch Mill Creek, Mill Creek, Redwood Creek, and the mainstem Smith River (Bensen 2010, Parish and Garwood 2015). However, a systematic survey to determine mussel distribution throughout the Smith River watershed has not occurred, and it is unknown whether mussel abundance is increasing, decreasing, or stable in the watershed.

A visual snorkel survey of the mussel population at the Dr. Fine Bridge project site in August 2016, indicated that at least 9,500 mussels are present, although the total number present at the site may be much higher depending on the number of mussels buried within the substrate and not visible to surveyors (e.g., 12,441 to 16,269 if 30–70 percent are buried). During August 2016 snorkel surveys upstream of the project site, mussels were also observed at an additional six sites previously recorded by Justin Garwood of CDFW. Of these six sites, the population at the project site was determined to be much larger in area and total number of mussels than any other site.

Although the replacement bridge is not expected to result in deterioration of mussel habitat or other impacts on mussels, as described above, there is potential for cumulative impacts on mussels during construction of the new bridge at the project site that warrants a pre-emptive salvage and relocation effort, in addition to protection of the existing mussel habitat. Mussel impacts could include behavioral changes (e.g., reduction in feeding or reproduction, changes in movement patterns), injury, and/or mortality. If mussel habitat is not permanently altered, then areas where mortality occurs, or areas where mussels were removed for relocation, may be recolonized. Potential for these impacts would be reduced with implementation of all of the recommendations described in Mussel-1 below. With implementation of all recommendations, a portion of the mussels at the project site may still be affected, but a greater portion would conceivably be protected and the population would remain viable.

2.3.3.4 Avoidance, Minimization, and/or Mitigation Measures

Species-1: Biological Monitor during In-stream Work. A qualified biologist would monitor in-stream construction activities to ensure adherence to all environmental permit conditions.

Species-2: Roosting Bat Protection. The following would be implemented to protect night roosting bats:

- Work activities would be limited to one portion of the bridge structure at a time between the hours of 10:00 PM and sunrise. No impact pile driving or hoe-ramming would occur during these hours.
- Airspace access to the structures would not be eliminated—as long as suitable roost (resting) habitat remains on site.
- Lighting used for night work would be focused specifically on the portion of the bridge actively under construction.
- Personnel would not be present under the bridge during the evening and night in non-active work areas.

The following would be implemented to protect maternal or day roosting bats:

- A preconstruction bat survey for maternity roosts (March 1 to August 31) or day roosts (year-round) shall be conducted by a qualified biologist and done within 14 days prior to activities that remove vegetation or structures.
- In the unlikely event that evidence of a day roost or maternity roost is discovered anywhere within the project footprint, Caltrans shall develop a plan in consultation with CDFW to safely exclude bats in accordance with Fish and Game Code and the LSAA (1600 permit).
- Bats shall not be evicted during the coldest winter months (December through February) if there is evidence that they could be in torpor or hibernating in a day roost within the bridge during that period; and bats shall not be evicted during the maternity season (March 1 to August 31) unless the colony can be safely evaluated by a qualified biologist and the biologist determines that it is no longer active.
- Appropriate measures to safely exclude bats from day roosts may include sealing cavities (if bats are no longer using them), using one-way doors (if colony locations are still in use) during periods when bats can readily and safely move to other locations without harming adults or young, or using acoustic methods for deterrence and exclusion. To avoid harm to bats, exclusion devices would be set up 2 hours after sunset, between September 15 and October 31 and/or between March 15 and April 15.

Species-3: Marine Mammal Monitoring. A biological monitor will be present to monitor for marine mammals during all construction activities that have the potential to produce impulsive hammering sounds within the Smith River, including any pile installation, hoe-ramming, or jackhammering. A Marine Mammal Monitoring Plan will be prepared prior to construction that includes adaptive measures, such as defining a safety zone around in-river activities. To minimize exposure to marine mammals and possible harm from construction activities, no impact pile driving would be initiated when marine mammals are detected within these safety zones. In addition, during impact driving, when a marine mammal is detected through on-site monitoring within the respective safety zones, or is about to enter the safety zones, impact pile driving would be halted and not resumed until the animal was seen to leave the safety zone on its own, or 30 minutes elapsed since the animal was last seen.

Species-4: Preconstruction Survey for Amphibians and Reptiles. A pre-construction survey for amphibians and reptiles would be completed by a qualified biologist prior to any ground disturbing activities. Any reptiles, frogs, tadpoles, and egg masses found during the initial survey would be relocated to suitable habitat outside of the project area by the biologist prior to conducting in-stream work in suitable habitat or electrofishing for salmonids or lamprey. The biologist would be present during all phases of in-stream construction to assist with relocation efforts as they arise. The specific requirements for surveys and relocation would be identified in the project's Aquatic Species Relocation Plan.

Species-5: Aquatic Species Relocation Plan. Prior to any dewatering, diversions, or stream crossings, the contractor would be required to provide to Caltrans for approval an Aquatic Species Relocation Plan as part of the Construction Site Dewatering and Diversion Plan. Electrofishing for salmonids must comply with the *Guidelines for Electrofishing Waters Containing Salmonids listed under the Endangered Species Act* published by NMFS. The plan would include provisions for amphibians, reptiles, and lamprey, as well as salmonids.

Species-6: Seasonal In-stream Restrictions. To protect the most vulnerable life stages of sensitive fish species that occur within the Smith River, in-stream work would be restricted to the period between June 15th and October 15th. Construction activities restricted to this period include any work within the bed, bank, or channel of the Smith River.

Species-7: Hydroacoustic Monitoring. Hydroacoustic monitoring would be conducted during all construction activities that have the potential to produce impulsive sound waves, including, but not limited to, pile driving, hoe-ramming, or jackhammering.

Hydroacoustic monitoring would ensure compliance with the terms and conditions resulting from CDFW CESA permitting and provide opportunity to adopt alternative construction methods to avoid or minimize project impacts where feasible. Peak sound pressure levels would not likely reach thresholds known to be injurious to fish, and the injury threshold for accumulated sound exposure levels (SEL) within a greater area of the river would be avoided by stopping work prior to reaching the SEL threshold.

A Hydroacoustic Monitoring Plan would be prepared prior to construction that addresses the frequency of monitoring, positions that hydrophones would be deployed, and techniques for gathering and analyzing acoustic data, quality control measures, and reporting activities.

Species-8: Pile-driving Methods. The following measures would be implemented to minimize potential impacts from pile driving.

- Installation of the permanent piles, which will occur within cofferdams, is proposed to occur using an oscillation technique, minimizing barotrauma effects on fish.
- Vibratory pile driving will be used in lieu of impact pile driving whenever feasible. Impact driving and hoe-ram operations will be minimized to the extent practicable.
- All in-channel pile driving activities will be conducted between June 15th and October 15th to avoid the primary salmon migration seasons.
- Impact driving and hoe ram operations will be limited to daylight hours only.
- Attenuation methods (e.g., bubble curtains) will be applied where feasible.

Species-9: Lamprey Protection. Because lamprey ammocoetes may not emerge from dewatered substrates until they begin to desiccate, which often occurs at night after other fish salvage operations have ceased (USFWS 2010), dewatering and relocation efforts for lamprey would be performed in accordance with *Best Management Practices to Minimize Adverse Effects to Pacific Lamprey* (*Entosphenus tridentatus*) (USFWS 2010), which include the following measures:

- A pre-construction survey conducted by a professional fisheries biologist prior to construction to identify lamprey presence.
- If present within cofferdams, electrofishing would be performed prior to dewatering to relocate ammocoetes within the work zone to a safe area away from the construction site.

- Dewatering of cofferdams would be performed slowly over several days, or at a minimum overnight, to allow opportunity for any remaining lamprey to relocate on their own.
- The orientation, siting and type of fish screens used for dewatering operations would be selected to prevent entrainment by lamprey.

Mussel-1. The following measures would be implemented to minimize impacts on western pearlshell mussels.

Mussel 1a. Conduct a mussel salvage and relocation effort from the Dr. Fine Bridge Site. Although the delineation of a mussel bed ESA within which no construction activities would occur has been proposed, the potential for cumulative impacts within the mussel bed ESA under all alternatives provides support for a mitigation measure in which a large portion of the western pearlshell mussel population (i.e., the lower and middle third, and potentially part of the upper third) is salvaged and relocated upstream of the project area. Specific considerations include the resulting increased water velocities as the upstream or downstream gravel berms are in place over 3 to 4 years during summer months when mussels are shallowly burrowed, vibrational installation of the downstream and upstream trestle piles over multiple years, and the potential for scour at piles with or without racked debris.

- Salvage and relocate mussels from the project site. Despite concerns associated with freshwater mussel salvage and relocation (*Relocation Risks*), relocation of mussels in advance of project activities ensures that the largest number of mussels could be safely translocated under preferred conditions.
- Relocate salvaged mussels from the delineated mussel bed to relocation sites identified in the Western Pearlshell Mussel Impact Assessment (Caltrans 2019j: Appendix A) following best practices (Blevins et al. 2017b), as carried out by a biologist familiar with the relocation sites and mussel relocation methods. Although the upper-third portion of the mussel bed was initially considered as a potential relocation site, scour model outputs suggest that unfavorable conditions may also occur in that area.
- Monitor mussels relocated from the Dr. Fine Bridge site. A qualified biologist should tag relocated mussels with radio-frequency identification (RFID) tags, uniquely numbered shellfish tags, or a similar delineating mark indicating a handled and relocated mussel following best practices (Blevins et al. 2017b). A subset of mussels already occurring at the relocation sites should also be tagged to document the effects

of relocation on the receiving population. The biologist should revisit the relocation site 1 to 2 months after relocation to determine the short-term success of relocation. Monitoring within 1 to 2 months after relocation can improve the chance of determining short-term mussel fates, before the shells of mussels that have suffered mortality are washed downstream.

- Conduct post-relocation monitoring. Post-relocation monitoring should be conducted annually during low-flow conditions and at temperatures above 10 °C to ensure maximum potential for observation. Mussels should also be monitored annually for 5 years post-relocation to determine the percent recovery, a proximate measure of survival, of relocated mussels. In lieu of setting benchmarks for success, this monitoring can serve to fill knowledge gaps that can subsequently be used to assess the effectiveness of this mitigation measure for future projects in the Smith River and elsewhere.

Mussel 1b. Establish a mussel bed ESA. Although it is recommended that mussels be salvaged and relocated from the surface of the Dr. Fine Bridge site, freshwater mussels can be abundant below the surface of the substrate. Some portion of the population could remain on site, even after multiple salvage passes as recommended in mussel salvage best practices (Blevins et al. 2017b). Therefore, a mussel bed ESA should still be established to protect the area of the mussel bed in the project area. Additionally, this could help to reduce the potential for impacts on the existing mussel habitat, which could conceivably be colonized by additional mussels (via host fish dispersal) following completion of the replacement bridge. The mussel bed ESA should be demarcated so as to protect the full width of the mapped mussel bed and the length of bed within the project footprint from direct impacts of piles, piers, gravel berms, or other in-water or out-of-water construction structures and activities.

- Clearly define and mark boundaries of the ESA. To ensure that construction activities do not directly affect the mussel bed, the ESA boundary should be clearly marked using readily visible boundary-defining indicators (flags, fencing, buoys). A map should also be prepared showing the ESA boundaries and made available to all construction crews during environmental awareness training. Boundary markers should remain in place and in good condition until construction is complete. No construction machinery or debris should enter the ESA, as mussels could be crushed, dislodged, or smothered and habitat could be adversely affected.
- Avoid construction activities in the ESA. Construction, demolition, and any activity such as dewatering should be avoided in the mussel bed ESA. If mussels are

identified in areas outside the ESA during the course of construction, they should be immediately salvaged and relocated by qualified personnel following the relocation mitigation measures outlined above.

- Employ a biomonitor to monitor for impacts on the mussel bed ESA and any remaining mussels during construction. If a subset of mussels is left on site or if mussels are discovered to occur within the mussel bed ESA after salvage activities have been completed, the biomonitor should monitor for impacts such as crushing, dislodgement, smothering, adverse effects of vibrational drilling, and impacts on habitat. Recommended on-site monitoring includes use of a remote camera setup to monitor conditions daily in real-time during construction activities. If impacts are observed and appear to affect more than 10 percent of the estimated mussels remaining on site, work should be stopped immediately to enable salvage and relocation using best practices (Blevins et al. 2017b).
- Prevent construction debris from falling into or entering the river. Construction debris should be prevented from falling or otherwise entering the river. Should any construction debris enter the river, material should be removed at the earliest possible date, and should not be dragged through the mussel ESA.

Mussel 1c. Normalize summer flows across the river. To reduce increases in velocity and shear stress within the mussel bed associated with the gravel berm, measures should be implemented to distribute flows across the channel rather than diverting the majority of flows through the mussel bed ESA where possible, including making gravel berms permeable to the extent practicable. In addition, softening the gravel berm corners at the southernmost ends of the proposed gravel berm may reduce the impacts of increased velocity and shear stress. This will reduce the potential impacts of higher summer velocities to existing habitat in the mussel bed ESA.

Mussel 1d. Implement standard BMPs including HF-1, HF-2, WQ-1, WQ-2, WQ-3, WQ-4, and WQ-5. Implement standard BMPs to avoid hazardous material spills or leaks, which could affect mussels. Stormwater BMPs and BMPs to reduce the potential for sedimentation, deposition of construction debris, or other impacts on water quality or habitat should be implemented.

Mussel 1e. Minimize erosion impacts. To reduce erosion as a result of clearing and grubbing, activities along the south shore should leave root systems intact to the extent possible and install a silt curtain or other erosion-control measure along the southern length of the bank adjacent to the mussel bed ESA. Other standard temporary construction BMPs, such as fiber rolls, could be used to address the potential for sediment transport even if roots are disturbed. Also, the area to be cleared and grubbed in the vicinity of the mussel bed ESA should be minimized.

Mussel 1f. Monitor and remove racked debris. Consistently monitor and remove racked debris on any structures throughout project construction to reduce potential for scouring of mussel habitat from any piles, piers, gravel berms, culverts, or other structures. To avoid disturbing mussel habitat, no material should be dragged through the mussel bed ESA.

Mussel 1g. Discourage recreational boat access at the mussel bed. Although no increased recreational access is proposed, if any future project changes were to occur, they should not incorporate actions that would increase recreational use of the bank adjacent to the mussel bed ESA. Increased recreational access could lead to increased trampling and other impacts on mussels.

2.3.4 Threatened and Endangered Species

2.3.4.1 Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA, 16 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 FHWA, are required to consult with the USFWS and the National Oceanic and Atmospheric Administration National Marine Fisheries Service 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 CESA, CFGC Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts on 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 2081 of the Fish and Game Code prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code 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 the CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, the CDFW may authorize impacts on CESA species by issuing a permit under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens 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.

2.3.4.2 Affected Environment

An NES (Caltrans 2019h) was prepared for the project. Table 2-20 lists the threatened and endangered species that are known to occur or have the potential to occur in the geographic region, as well as the effects findings for federally listed species. These species were identified based on the CNDDB records search (2019), species lists provided by USFWS (2019) and NMFS (2019), and species distribution and habitat requirements data (Appendix F).

Table 2-20. Threatened and Endangered Species with the Potential to Occur in the Vicinity of the Project

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale	FESA Effect Finding
	Federal	State				
Mammals						
Humboldt marten *Martes caurina humboldtensis*	FPT	SCT/ SSC	Associated with late-successional redwood forest, and preference for low, overhead cover.	Absent	No suitable habitat within or immediately adjacent to BSA.	No Effect
Pacific fisher West Coast Distinct Population Segment (DPS) *Pekania [=Martes] pennanti*	FPT	--	Associated with intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure.	Absent	No suitable habitat within or immediately adjacent to the BSA as there are no large areas of mature, dense forest in the project vicinity.	No Effect
blue whale *Balaenoptera musculus*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect
fin whale *Balaenoptera physalus*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect
humpback whale *Megaptera novaengliae*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect
Killer whale *Orcinus orca*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect
Right whale *Eubalaena japonica*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect
sei whale *Balaenoptera borealis*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale	FESA Effect Finding
	Federal	State				
sperm whale *Physeter microcephalus*	FE	--	Open Ocean	Absent	No suitable habitat within or immediately adjacent to the BSA.	No effect
Birds						
marbled murrelet *Brachyramphus marmoratus*	FT	SE	Occurs in marine subtidal and pelagic habitats from the Oregon border to Santa Barbara County, largely concentrated on coastal waters off Del Norte and Humboldt Counties, and in lesser numbers off the coast of San Mateo and Santa Cruz Counties	Absent	There is no critical habitat within the BSA; the closest critical habitat is 3 miles to the southeast in Jedidiah Smith Redwoods State Park. Technical assistance with USFWS has determined that the Dr. Fine Bridge Replacement Project would have no effect on MAMU or designated critical habitat for the species.	No Effect
western snowy plover (Pacific coast population) *Charadrius nivosus [=alexandrines] nivosus*	FT	SSC	Breeds primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries.	Absent	Known from the project region (Smith River Spit and Tolowa Dunes). There is no suitable habitat for western snowy plover within the BSA.	No Effect
Western yellow-billed cuckoo – Western DPS *Coccyzus americanus occidentalis*	FT	SE	Inhabits extensive deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation.	Present	Suitable foraging and nesting habitat in BSA (riparian vegetation). The BSA is not within proposed critical habitat. Surveys in 2016 did not detect presence of this species.	May Affect, Unlikely to Adversely Affect

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale	FESA Effect Finding
	Federal	State				
little willow flycatcher *Empidonax traillii brewsteri*	--	SE	Prefers extensive thickets of low, dense willow thickets in lowland and montane habitats. Prefers willows edge on wet meadows, ponds, or backwaters.	Present	Known to occur adjacent to BSA based on protocol-level surveys.	N/A
bald eagle *Haliaeetus leucocephalus*	--	SE, FP	Occurs along ocean shores, lake margins, and rivers for both nesting and wintering. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine.	Present	Potential for nesting or foraging in the BSA. Bald eagles were not observed during numerous field reviews.	N/A
bank swallow *Riparia riparia*	--	ST	Occurs in low areas along rivers, streams, ocean coasts, or reservoirs. Territories usually include vertical cliffs or banks where they nest in colonies of 10 to 2,000 nests. Known to populate human-made sites, such as sand and gravel quarries or road cuts.	Absent	Nests of the species have been observed in gravel piles within a gravel mining operation southeast of the BSA (Michael van Hattem, per. comm February 2017). No suitable nesting habitat is present in the BSA.	N/A

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale	FESA Effect Finding
	Federal	State				
northern spotted owl *Strix occidentalis caurina*	FT	ST, SCC	Dense, mature, multi-layered mixed conifer, redwood and Douglas-fir forests with permanent water and suitable nesting trees and snags from sea level to 7600 ft; in southern California, nearly always associated with oak and oak-conifer habitats.	Absent	The northeast section of the BSA (north of SR 197 and east of US 101) is within the western boundary of northern spotted owl critical habitat. However, the forested habitat in this area does not constitute a mature forest with developed stratification and canopy cover. Technical assistance with USFWS has determined that the project would have no effect on the species or designated critical habitat for the species.	No Effect
Amphibians and Reptiles						
Green sea turtle *Chelonia mydas*	FT	--	Oceanic beaches (for nesting), convergence zones in the open ocean, and benthic feeding grounds in coastal areas.	Absent	There is no suitable habitat for the species within the BSA.	No Effect
Leatherback sea turtle *Dermochelys coriacea*	FE	--	Open ocean, but also forage in coastal waters.	Absent	There is no suitable habitat for the species within the BSA.	No Effect
Olive (=Pacific) ridley sea turtle *Lepidochelys olivacea*	FT	--	Open ocean, but has been known to inhabit coastal areas, including bays and estuaries.	Absent	There is no suitable habitat for the species within the BSA.	No Effect

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale	FESA Effect Finding
	Federal	State				
foothill yellow-legged frog *Rana boylii*	--	SCT, SSC	Associated with partly shaded, shallow streams and riffles with rocky substrate in a variety of habitats, but mostly higher than 200m elevation in areas not occupied by bullfrogs.	Present	Egg masses observed outside the BSA. Marginally suitable habitat present within BSA.	N/A
Fish						
coho salmon (southern Oregon/northern California Coast ESU) *Oncorhynchus kisutch*	FT, CH, EFH	ST,	Anadromous fish species that spawns and spends a portion of its life in fresh inland streams, maturing in the open ocean.	Present	Known to be present in the Smith River.	May Affect, Likely to Adversely Affect (applies to individuals, CH) and May Adversely Affect (EFH)
Chinook salmon (Southern Oregon/ Northern California Coastal ESU) *Oncorhynchus tshawytscha*	EFH	--	Cool, rocky streams with moderate size gravel for spawning and shade trees for cover and rearing.	Present	Known to be present in the Smith River.	May Adversely Affect (EFH)
longfin smelt *Spirinchus thaleichthys*	--	ST, SCC	Spend their adult life in bays, estuaries, and nearshore coastal areas, and migrate into freshwater rivers to spawn.	Present	Potential uncommon visitor in the Smith River in the BSA.	N/A
Pacific eulachon *Thaleichthys pacificus*	FT		Nearshore open waters.	Present	Spawn infrequently in Smith River.	May Affect, Likely to Adversely Affect
sDPS Green Sturgeon *Acipenser medirostris*	FT	--	Spawn in the Sacramento, Feather, and possibly the Yuba rivers.	Absent	The southern sDPS are not found in the Smith River.	No Effect

Common and Scientific Name	Legal Status[1]		Habitat Requirements	Habitat Present/ Absent	Rationale	FESA Effect Finding
	Federal	State				
tidewater goby *Eucyclogobius newberryi*	FE	SCC	Restricted to waters with low to moderate salinities in California's coastal wetland habitats like lagoons, estuaries, and salt marshes where brackish water conditions occur at less than 12ppt salinity.	Absent	Technical assistance with USFWS has determined that the project site is outside the tidal influence and the project site is unsuitable for the species.	No Effect
Invertebrates						
Oregon silverspot butterfly *Speyeria zerene hippolyta*	FT	S1	Habitat consists of marine terrace, coastal headland salt spray meadows, stabilized dunes, and montane grasslands.	Absent	Obligatory host plant, blue violet (*Viola adunca*), is absent.	No Effect
Plants						
western lilly *Lilium occidentale*	FE	SE	Found along margins of ephemeral ponds and small channels, as well as coastal prairie and scrub near the ocean.	Present	Potentially suitable habitat is present, but species was not found during focused botanical surveys.	No Effect

[1] Status explanations:
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 = proposed threatened
CH = critical habitat
EFH = essential fish habitat
SE = listed as endangered under the California Endangered Species Act
ST = listed as threatened under the California Endangered Species Act
FP = designated as a fully protected species under the CFGC
SCT = State candidate threatened

Threatened and Endangered Plants

A CNPS inventory (CNPS 2019), CNDDB records search (2019), and USFWS species list (2019), indicate that many special-status plants occur in the project region and potential habitat is present in the BSA for many special-status plant species, including western lily (*Lilium occidentale*), which is federally and state listed as endangered. However, no special-status plants have been detected in the BSA during multiple botanical surveys conducted during the appropriate bloom period (Caltrans 2015e, 2017g).

Yellow-Billed Cuckoo – Western DPS

Yellow-billed cuckoo (YBCU or cuckoo)–Western DPS is a federally threatened and state endangered species. USFWS has initiated a proposal to list critical habitat for YBCU; however, Del Norte County is not currently included in the proposal. In California, YBCU breed rarely and locally along rivers in the central and southern sections of the state; the Sacramento River and South Fork Kern River are the only two localities in California that were known to sustain breeding populations of YBCU (Franzeb and Laymon 1998) until recently. Large-scale restoration efforts on the lower Colorado River appear to be supporting growing YBCU populations, with 56 breeding pairs observed in 2016 (Parametrix and SSRS 2016). Meanwhile, the South Fork of the Kern River was down to two nesting pairs in 2016 (SSRS 2016). The Sacramento River population declined from 29 cuckoo pairs in 1977 to two estimated pairs (based on repeated detections at the same location) in 2012 (Dettling.et. al 2015). The species breeds in large contiguous patches of multilayered riparian habitats (particularly woodlands with cottonwoods and willows).

Cuckoos arrive in their breeding grounds in the western U.S. in May and June (Franzreb and Laymon 1993). Nesting usually occurs between late June and late July but can begin as early as late May and continue until late September (Hughes 1999). According to the USFWS survey protocol for the species (Halterman et al. 2015) most cuckoos nest between June 15 and August 15. They may nest at more than one location in a year. After nesting, cuckoos migrate to Central and South America to overwinter (Hughes 1999).

There is one known occurrence for cuckoo in the Smith River Watershed, consisting of a sighting record with a photograph of one cuckoo on June 3, 2015 at the Smith River bottoms near Fort Dick, less than a mile downstream of Dr. Fine Bridge (eBird 2019a, CNDDB 2019). There are several observer records for cuckoo in eBird in late July 2015 at the Arcata Marsh, approximately 70 miles to the south of the project, and the species has been found along the lower Eel River and/or nearby Salt River in Humboldt County (approximately 90 miles south) by several observers in 2001, 2005-2008, and 2013 (eBird 2019b). It is unknown if these detections were associated with nesting birds or if the birds were moving through the area; however, these records are within the species' typical nesting period (June 15 to August 15).

Protocol surveys conducted for cuckoo within the BSA in 2012 by Caltrans staff detected no cuckoos. Additional protocol-level surveys were completed by S. McAllister in 2016, covering almost a mile stretch of the river centered on the bridge, with no detections. There are no confirmed nesting records and the date of the single record in the Smith River Watershed (June 3) is near but not within the typical nesting period.

The habitat along the banks of the Smith River at Dr. Fine Bridge generally falls within the willow-cottonwood riparian type preferred by YBCU, but with two distinct differences: 1) there is a large amount of red alder present, and 2) the patches are of relatively small size and occur in long and narrow strips (McAllister pers. comm.). It should be noted that the habitat parameters described in the literature do not include assessments of areas along the north coast of California where cuckoos have been documented during the breeding season over the past 15 years, and where narrow riparian strips with a red alder component are the norm.

The areas that were surveyed near the bridge, along both riverbanks upstream and downstream of the bridge, are generally consistent with habitats where cuckoos have been found along the lower Eel River. The only exception is the habitat on the north bank, upstream of the bridge, where coniferous trees are dominant. This area was deemed unsuitable and was mostly excluded from the survey area.

Existing noise and visual disturbance from U.S. 101 and gravel mining operations within the BSA may deter cuckoo from using much of the area. In a study regarding call detections from North Carolina, Goodwin and Shriver (2010) found that cuckoos are 10 times less likely to use noisy plots than quiet plots. Also, traffic noise occurs within a similar range to cuckoo calls (< 3 kilohertz) and could mask or prevent effective communication between mating individuals. Therefore, highway noise may deter use of cuckoo habitat close to the highway, making these areas less suitable than habitat further from this consistent source of noise and light.

Little Willow Flycatcher

Little willow flycatcher (WIFL) is listed by the State of California as an endangered species. WIFLs nest in riparian habitat dominated by willow (*Salix* spp.) and/or alder (*Alnus* spp.) trees near permanent, low-gradient rivers within and adjacent to forested habitats.

WIFLs are not common to northwestern California (Zeiner et al. 1990). The status of the species in Del Norte County is not thoroughly understood and confirmed breeding associated with the Smith River has not been observed. The first confirmed breeding in nearby Humboldt County was noted on the lower Klamath River in 1998 (Hunter et. al. 2005). This proved to be a noteworthy nesting observation as an adult was feeding a juvenile in a stand of sapling tanoak and Douglas-fir with a few willows in an area that had been clear-cut approximately 10 years prior to the sighting.

The WIFL typically arrives in breeding areas in May and June, after wintering in Central and South America, and departs in August (Zeiner et al 1990).

The species was not detected during protocol surveys conducted within the BSA in 2012 or 2016. However, three males were detected outside the BSA in 2016. All three detections occurred June 15, 2016, in braided channels with sparse willow riparian habitat. Distances to the bridge ranged between 1,250 and 2,465 feet. The focus of the surveys was to document presence or absence, and the breeding status of these birds is unknown. Therefore, they could have been migrants or nesting. No WIFLs were observed during the July survey in 2016.

Foothill Yellow-legged Frog

The foothill yellow-legged frog is a CDFW Species of Special Concern and a state candidate for listing as Threatened. This species is associated with partly shaded, shallow streams and riffles with rocky substrate in a variety of habitats, mostly at elevations higher than 656 feet and not occupied by bullfrogs. During cold weather, individuals seek cover under rocks in the streams or on shore within 6 feet of water. This species is rarely encountered far from permanent water. Eggs are attached to gravel or rocks in moving water near stream margins. Mating and egg laying occurs exclusively in streams and rivers (not in ponds or lakes).

Several foothill yellow-legged frogs have been observed along Hutsinpillar Creek northwest of the BSA (CNDDB 2019). A survey for foothill yellow-legged frog, focusing on detections of egg masses, was completed for the project on June 7, 2017 by CDFW and Caltrans staff. The survey covered all accessible shallow, low velocity margin areas adjacent to the river and backwater pools one mile upstream of the bridge and one-third mile downstream of the bridge. Several egg masses and one sub-adult were observed during the survey. All of the detections were outside the BSA. The bank margins of the Smith River within the BSA do not provide low velocity flows required for breeding, thus the species is not expected to breed within the project footprint. The perennial streams within the BSA also do not provide breeding habitat for the species; however, the adjacent forest and scrub-shrub wetland communities may provide suitable forage and refuge habitat. However, this species is highly aquatic and rarely found more than a few meters away from suitable aquatic habitat (Zeiner et al. 1990)

Coho Salmon

The Smith River is located within the Southern Oregon/Northern California Coast (SONCC) coho salmon Evolutionarily Significant Unit (ESU), which includes all naturally spawning populations of coho salmon in coastal streams between Cape Blanco, Oregon, and Punta Gorda, California. The SONCC ESU is listed as threatened under FESA and CESA. Critical Habitat has been designated for this ESU. SONCC ESU coho also has Essential Fish Habitat (EFH) designated under the Magnuson-Stevens Act.

Coho salmon are anadromous fish that exhibit a three-year life cycle, typically spending 14 to 18 months in fresh water before migrating to the ocean and then returning to fresh water to spawn at the age of three years. A small percentage of males return to fresh water to spawn early (in their second year, before spending a winter at sea) as “jacks” (NRC 2004). A few juveniles may also remain in fresh water for two years (Bell et al. 2001). After their freshwater rearing period, young migrate downstream to the ocean beginning in late March/early April. Peak downstream migration in California generally occurs from April to early June.

The Smith River coho salmon population is identified as a core, functionally independent population within the Central Coastal diversity stratum of the SONCC ESU. The risk of extinction for the Smith River population of coho salmon is considered high, with the population likely below the depensation threshold (NMFS 2014, 2016).

Historically, coho salmon were widespread in the Smith River watershed, likely occupying all low-gradient tributaries of the lower watershed where intrinsic potential is highest based on juvenile rearing potential (Williams et al. 2006). Recent surveys of spawning adults, redds, and juveniles have documented coho salmon in many tributaries throughout the Smith River basin (Garwood and Larson 2014, Walkley and Garwood 2017). The highest occupancy by coho salmon has been observed in low-gradient tributaries of the lower watershed.

In the Smith River estuary, construction of dikes and reclamation of lands for agriculture and grazing have greatly reduced the amount of juvenile rearing habitat. Diversions of water for flower bulb cultivation, alfalfa production, and other purposes in the Smith River drainage may affect salmon outmigration, depending on seasonal timing and volume of water diversions. In addition, cattle grazing along the Smith River estuary has also degraded stream banks and reduced or eliminated riparian vegetation. Overwintering habitat in the tributaries is also recognized as a major limiting factor for juvenile production and overall carrying capacity of the watershed.

A study on the distribution of juvenile salmonids within the lower Smith River basin and estuary found that the river maintains moderately productive salmonid populations (Parish and Garwood 2015). The study found juvenile coho salmon were widely distributed during the summer, especially in the mainstem Smith River, but had higher use of coastal tributaries during the winter than the summer. Juvenile coho salmon can be found near the bridge year-round and are likely associated with beaver dams (Garwood pers. comm.).

Snorkel surveys conducted by Caltrans biologists in 2011, and CDFW biologists in 2011 and 2012, show coho salmon present in the BSA. Within the project area, juvenile coho salmon have been observed in summer using the vegetated channel margins on both banks of the river, and in association with active beaver dens within 350 feet of the existing bridge (Parish and Garwood 2016, Garwood pers. comm.).

Most adult coho salmon enter the Smith River to spawn between November and January (Larson 2013). Although there is no coho salmon spawning habitat within the BSA (Justin Garwood, pers. comm. October 16, 2015), the reach of the Smith River near the project provides a migratory corridor for both adult and juvenile coho salmon, as well as rearing habitat for juveniles.

The Smith River in the BSA is a migratory corridor for adult coho salmon migrating to upstream spawning areas in the Smith River basin and is used by juveniles for rearing and passage during their seaward migration and movements to non-natal rearing habitat. Restricting in-water construction activities to June 15-October 15 avoids the primary migration periods of adult coho salmon in the BSA. This period also avoids the most sensitive life stages (age 0+ fry) and the peak migration periods of emigrating juveniles (age 1+) (March through May). However, emigrating juveniles may be present in the BSA through June based on outmigrant trapping records in Mill Creek.

Coho Critical Habitat

NMFS designated critical habitat for the Southern Oregon/Northern California Coast coho salmon ESU on May 5, 1999. Critical habitat for coho salmon includes physical or biological features (PBFs) essential to the conservation of the species. Critical habitat for coho salmon includes all waterways, substrate, and adjacent riparian zones below long-standing, naturally impassable barriers (e.g., natural waterfalls in existence for at least several hundred years) that provide the following:

- Freshwater spawning sites (features supporting spawning, incubation and larval development)
- Freshwater rearing sites (features supporting juvenile development including natural cover such as shade, submerged and overhanging large woody debris, beaver dams, and aquatic vegetation)
- Freshwater migration corridors (features supporting juvenile and adult mobility and survival such as submerged and overhanging large woody debris and side channels)
- Estuarine areas (features supporting juvenile and adult physiological transitions between fresh and salt water such as submerged and overhanging large woody debris) and both juvenile and adult forage promoting growth and maturation
- Nearshore marine areas (features supporting juvenile transition from natal streams to offshore marine areas such as natural cover and aquatic vegetation)
- Offshore marine areas (features essential for juveniles to forage and grow to adulthood such as aquatic invertebrates and fish)

The reach of the Smith River near Dr. Fine Bridge does not provide elements used by salmonids for spawning. It does, however, serve as a migratory corridor for both juveniles and adults and provides rearing habitat for juveniles. PBFs within the BSA include the riparian habitat associated with riverbanks as well as beaver dens.

Longfin Smelt

Longfin smelt is listed as threatened under CESA. North coast populations of longfin smelt are not federally listed; only the San Francisco Bay-Delta population of longfin smelt is listed under FESA. Longfin smelt is an anadromous fish, typically found in nearshore marine environments, bays, and estuaries from San Francisco Bay north to Lake Earl (near the Oregon border). The San Francisco Estuary and the Sacramento-San Joaquin Delta support the largest longfin smelt population in California, and Humboldt Bay likely ranks second in longfin smelt abundance. Most descriptions of longfin smelt life history in California focus on San Francisco Bay populations. Relatively little is known about north coast longfin smelt populations or life history.

Adults migrate into low salinity or freshwater reaches of coastal rivers and tributary streams close to the ocean to spawn. The larvae are buoyant and are quickly swept downstream into brackish water. Larvae are able to swim up and down in the water column and use the river and tidal currents to stay in areas where fresh and salt water mix.

Snorkel surveys conducted by Caltrans biologists in 2011 and CDFW biologists in 2011 and 2012 found no longfin smelt in the BSA. Longfin smelt are known to have spawning sites many miles upstream from brackish water. For example, the species has been detected in several Humboldt Bay tributaries, considerable distances upriver of the transition from salt to freshwater (Garwood pers. comm.). However, it is unclear whether individuals would be frequent visitors to Dr. Fine Bridge. While probably not a common visitor, presence within the BSA cannot be ruled out.

Eulachon

The Smith River is within the boundaries of the Southern DPS of eulachon, which is a federally threatened species under FESA with designated critical habitat. The critical habitat designation for eulachon does not include the Smith River.

Eulachon is a small anadromous fish that is found in nearshore ocean waters. It usually spends three to five years in salt water before returning to lower reaches of larger snowmelt-fed rivers to spawn. Spawning occurs from late winter through mid-spring in the lower reaches of rivers over sand or course gravel substrates (NMFS 2015). The species is endemic to the eastern Pacific Ocean and ranges from northern California to southwest Alaska and into the Bering Sea. In California, eulachon have been documented in the Klamath River and several coastal rivers in northern California, including the Mad River, Redwood Creek, and tributaries of Humboldt Bay. Nearly all spawning runs in the United States have declined in the past 20 years. It is thought spawning may be limited to tidally influenced portions of rivers from late through mid-spring (NMFS 2015). Although documented in the Smith River over 40 years ago (Parrish and Garwood 2015), the species has not been observed during any recent snorkel surveys. Presence of the species near the bridge is unlikely but cannot be ruled out.

Essential Fish Habitat

EFH is defined by the Magnuson-Stevens Act for federally managed species as “those waters and substrate necessary for fish for spawning, breeding, feeding, or growth to maturity.” Elements of EFH include adequate substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. Waters include aquatic areas and their associated physical, chemical, and biological properties. The three management plans that cover the Smith River are described below.

Pacific Coast Salmon Fishery Management Plan: Coho and Chinook salmon are two of the three salmonid species included in the Pacific Coast Management Plan. The third species, pink salmon, is not found at the project site.

Coastal Pelagic Species Fishery Management Plan: There are five species within the Coastal Pelagic Species Fishery Management Plan: northern anchovy (*Engraulis mordax*), market squid (*Loligo opalescens*), Pacific sardine (*Sardinops sagax*), Pacific (*chub*) mackerel (*Scomber japonicas*), and jack mackerel (*Trachurus symmetricus*).

Pacific Coast Groundfish Fishery Management Plan: Eighty-three species compose the Pacific Coast Groundfish Fishery Management Plan. Rockfish species are the dominant type of fish in the plan. Other groups of fish in this plan include sharks, roundfish, and flatfish. Species in the plan occupy diverse habitats at all stages in their life histories.

The portion of the Smith River in the BSA does not experience tidal influence, thus does not support EFH for species included in the Coastal Pelagic Species Fishery Management Plan or the Pacific Coast Groundfish Fishery Management Plan. It does, however, provide EFH for coho salmon and Chinook salmon included in the Pacific Coast Salmon Fishery Management Plan. The segment of the Smith River under Dr. Fine Bridge serves as a migration corridor for juveniles and adults for both species. Coho salmon are known to rear within the BSA. The BSA is thought to also provide rearing habitat for Chinook salmon because juveniles were detected during fall snorkel surveys conducted in 2011 and 2012.

2.3.4.3 Environmental Consequences

Build Alternatives

Threatened and Endangered Plants

No special-status plant species, including the federally listed western lily, have been documented within or adjacent to the BSA; therefore, all build alternatives would not be expected to directly or indirectly affect special-status plants.

Yellow-Billed Cuckoo – Western DPS

Although it is unlikely that YBCU would breed within the BSA, construction activities under all build alternatives have the potential to affect cuckoos, if present, through riparian vegetation removal and noise or visual disturbance during construction and demolition activities. No long-term effects on YBCU or potential habitat for the cuckoo would occur following completion of construction activities.

Riparian habitat in the BSA, including arroyo willow thicket, Sitka willow thicket, and red alder forest habitats along the Smith River, will be removed prior to construction activities outside of the nesting season. The most substantial impacts on potential cuckoo habitat would occur during clearing and grubbing of vegetation prior to establishing access roads and staging areas, and clearing for construction of the bridge. Riparian vegetation, which represents potential YBCU nesting and foraging habitat, would be temporarily and permanently affected under all build alternatives, as described in Section 2.3.1, *Natural Communities*. As shown in Table 2-15, Alternatives 1 and 2 would temporarily affect approximately 3.80 acres of riparian habitat and Alternative 3 would temporarily affect approximately 3.32 acres of riparian habitat. Alternatives 1 and 2 would permanently affect approximately 0.30 acre of riparian habitat and Alternative 3 would permanently affect approximately 0.08 acre of riparian habitat. Under all build alternatives, the permanent effects on potential YBCU nesting and foraging habitat would be small, and there are more suitable (larger and quieter) riparian stands up and down river from the BSA.

Under all build alternatives, the project will avoid any vegetation removal during the nesting season for all birds (February 1 through September 15), as described in *Project Features, Standard Measures, and Best Management Practices*. Additionally, under no circumstances would vegetation removal occur within the YBCU nesting season (June 1 through August 15). This would eliminate the possibility of direct take of nesting YBCU. Removal of riparian vegetation, although mostly temporary and occurring in less than ideal habitat, could indirectly affect YBCU by temporarily reducing available nesting and foraging habitat in the immediate vicinity of the bridge until the temporarily disturbed areas are restored.

Cuckoos could be indirectly affected by visual and noise disturbance from project activities during phases of construction that occur during the nesting season, when cuckoos could be present. Cuckoos in the vicinity of the project footprint would be exposed to higher levels of visual and noise disturbance and cuckoos are known to be secretive and avoid areas of visual and noise disturbance. Although baseline visual and noise disturbance from bridge traffic and gravel operations already likely discourage cuckoo from using areas close to the bridge and active gravel facilities, visual and noise disturbance from construction activities would decrease the value of foraging habitat near the bridge.

Because the project contains potential habitat for the species, an informal Section 7 consultation with USFWS would be conducted. Consultation is expected to result in concurrence with a *may affect not likely to adversely affect* determination for YBCU.

An endangered species consultation with CDFW would not be necessary because potential impacts on this species would not meet the CESA definition of take. According to CFGC Section 86, “take means, hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (CDFG 1957). This definition does not include harassment, including construction noise. Removal of nesting habitat during the non-breeding season would not result in removal of a nest. Therefore, the project would not require an Incidental Take Permit pursuant to CESA. Construction noise adjacent to the habitat is not anticipated to result in nest abandonment or failure because there is a low likelihood of occurrence in general and existing conditions (visual and noise disturbance from road traffic and mining operations) are already likely to discourage YBCU from using the area.

Little Willow Flycatcher

Although willows and alders, which can support nesting, are present in the riparian habitat adjacent to the bridge, the habitat value of the riparian vegetation in the BSA has been greatly reduced because of clearing for gravel mining, structures, and farming, resulting in narrow strips of marginally suitable habitat. However, potential breeding within the BSA cannot be dismissed. The project will avoid any vegetation removal during the nesting season for all birds (February1 through September 15). Additionally, under no circumstances would vegetation removal occur within the YBCU nesting season (June 1 through August 15).

If the species were to breed in the BSA, removal of nesting habitat would occur outside of the little willow flycatcher nesting season (June –August) and any project-related effects would not rise to the level of ‘take.’

As described for YBCU above, the CESA definition of take does not include harassment, including construction noise. Therefore, the project would not require an Incidental Take Permit pursuant to CESA for potential impacts on little willow flycatcher. Construction noise adjacent to the habitat is not anticipated to result in nest abandonment or failure. In the unlikely event little willow flycatcher were to nest in adjacent habitat, the existing vegetation provides a visual barrier and partial noise buffer between suitable nesting habitat and the construction site. Furthermore, work is expected to commence prior to the nesting season, which would either deter nesting near the bridge or allow birds to acclimate to disturbance caused by construction.

Foothill Yellow-legged Frog

Under all build alternatives, the project is not expected to affect breeding foothill yellow-legged frogs given the lack of suitable breeding habitat within the construction footprint. Since it is possible the species could be present within the adjacent riparian habitats, the *Project Features, Standard Measures, and Best Management Practices* that cover aquatic species relocation requires that a qualified biologist be present to relocate frogs to suitable habitat outside the construction zones. A CESA permit from CDFW may be required.

All build alternatives would not have a substantial effect on foothill yellow-legged frogs given the minimal project footprint in potential habitat, the temporary nature of construction, and the abundance of suitable habitat in the project vicinity to relocate frogs if necessary.

Coho Salmon

During construction, fish may temporarily avoid this reach of the river to some extent due to underwater noise and other disturbances, as well as the lack of riparian vegetation resulting from vegetation removal for construction access. While project activities may occur for three to four years, these impacts would be temporary. The proposed project is not likely to result in adverse modification of designated critical habitat for coho salmon.

Under all build alternatives, effects on coho salmon could occur as a result of one or more of the following:

- ***Water Quality***—temporary increases in turbidity, suspended sediment, and contaminant risk during in-water construction and demolition activities.
- ***Noise and Visual Disturbance***—potential behavioral effects from general construction/demolition noise and visual disturbance (e.g., artificial light).
- ***Direct Injury***—potential injury/mortality from direct contact with construction equipment/materials and capture/relocation.
- ***Fish Passage***—potential migration delays (adults and juveniles) and increased exposure of juveniles to predation during passage through the constricted portion of the main channel.
- ***Pile Driving and Demolition Noise***—potential injury and mortality of fish from exposure to impact pile driving noise exceeding established thresholds for the onset of injury.
- ***Habitat Impacts***— Temporary and permanent losses of riparian habitat from clearing of vegetation for construction access and staging areas; temporary losses of riverine and benthic habitat from riverine fill (temporary gravel berms); and temporary shading of

riverine and riparian habitat from temporary trestles. The potential effects are further described below.

Water Quality

Construction activities that disturb soil and sediments in stream channels, riparian zones, and floodplains can increase erosion and mobilization of sediments, resulting in increased turbidity and suspended sediment in streams and potential adverse effects on aquatic species and their habitat. Potential effects of elevated turbidity and suspended sediment include physiological and behavioral effects on individual fish and effects on coho salmon critical habitat, including water quality, substrate, and space. Also, project actions that involve the storage, use, or discharge of toxic and other harmful substances near streams and other water bodies (or in areas that drain to these water bodies) can result in contamination of these water bodies and adverse effects on fish and other aquatic organisms.

High turbidity can disrupt feeding, displace fish from established territories, and stimulate downstream migration. Bisson and Bilby (1982) reported that juvenile coho salmon avoided turbidity exceeding 70 NTUs (nephelometric turbidity units). Berg and Northcote (1985) reported that feeding and territorial behavior of juvenile coho salmon were disrupted by 2.5- to 4.5-day exposures to turbid water (up to 60 NTUs). Sigler et al. (1984) reported that turbidity between 25 and 50 NTUs reduced growth and increased the number of juvenile coho salmon and steelhead migrating from laboratory streams. Fish displaced from established territories may not be able to find suitable or unoccupied habitat and may become more susceptible to predation and increased competition with other fish.

The total area of ground disturbance and vegetation clearing under Alternatives 1 and 2 is greater than for Alternative 3. However, the difference in disturbed area between the alternatives is minor and the risk of increased sediment and turbidity from ground disturbance and vegetation clearing for construction access would be similar for all build alternatives.

Hydraulic modeling and scour analyses performed by Caltrans to evaluate potential hydraulic and geomorphic effects of the temporary and permanent structures under all build alternatives on aquatic habitat predict localized increases in water velocities and shear stress capable of causing scour around the in-channel piles (Caltrans 2019m). Localized scour at temporary bridge piers (Alternative 3 only) and at construction trestle piles (all alternatives) during peak winter flow events is expected to result in temporary, localized increases in suspended sediment and turbidity during the first series of major flow events. Although the total volume of fine sediment potentially mobilized in any given event is uncertain, the contribution of suspended sediment resulting from scour is expected to be small relative to the total sediment loads in the river during such events. Based on the composition of the bed substrate in the river at this location (Caltrans 2016b), the majority of bed material subject to scour is coarse gravel that typically is transported as bed load infrequently during large flood events.

Under all build alternatives, the concentration of suspended sediment and duration of exposure to adults and juvenile salmonids is expected to be well below the thresholds for physiological stress. In addition, most of the activities that are likely to generate the highest turbidity and suspended sediment levels would occur during the in-channel construction season (June 15-October 15) and thereby would avoid the most sensitive juvenile life stage and the primary migration periods of adult and juvenile coho salmon in the BSA. During in-water construction activities, small numbers of juvenile coho salmon that may be exposed to elevated turbidity and suspended sediment immediately downstream of these activities may be displaced from preferred habitat, resulting in brief disruptions in feeding and increased risk of predation or competition for food or space if displaced to occupied habitat outside the areas of disturbance. However, these disruptions are unlikely to affect survival or growth because of the localized, temporary nature of the disturbance and availability of suitable habitat outside the affected areas. Similarly, potential increases in sediment deposition would likely be limited to a single season and affect only a small area of the streambed, resulting in only temporary, localized effects on the abundance or production of benthic invertebrates. Therefore, the effects of increased turbidity and suspended sediment on juvenile coho salmon would likely be limited to temporary behavioral effects, resulting in little or no risk of adverse effects on growth or survival. Also, based on the anticipated volumes and timing of sediment produced relative to natural levels, any accumulations of sediment in holding areas (pools) or food-producing areas (riffles) downstream of the construction site are expected to be temporary and unlikely to have significant effects on coho critical habitat.

Potential adverse effects of increased turbidity, suspended sediment, and contaminant exposure on listed species and aquatic habitat would be avoided or minimized through implementation of Project Features, Standard Measures, and BMPs. With restrictions of in-channel work activities from June 15^{th} to October 15^{th} and implementation of standard erosion and sediment control measures, pollution prevention measures, and storm water treatment measures, potential environmental effects would be temporary and localized, limited to minor increases in turbidity and suspended sediment during in-channel construction activities. Potential effects would likely be limited to temporary displacement (i.e., avoidance) and re-distribution of juveniles immediately downstream of work areas in response to brief periods of elevated turbidity and suspended sediment associated with channel-disturbing activities (e.g., seasonal installation of the gravel berm). In addition, no measurable long-term increases in pollutant loading from roadway runoff over the existing condition is expected, as existing roadway and bridge drainage systems would be modified to accommodate any expected increases in stormwater discharge resulting from additional impervious area.

Noise and Visual Disturbance

General construction noise and vibrations (non-impulsive, continuous sources of noise below injury thresholds discussed below under Pile Driving and Demolition Noise), artificial nighttime light, and other physical disturbances can harass fish, disrupt or delay normal activities, or increase potential exposure or vulnerability to predators. The potential magnitude of effects depends on a number of factors including the type and intensity of the disturbance, proximity of the action to the water body, timing of actions relative to the occurrence of sensitive life stages, and frequency and duration of activities. For most activities, the effects on fish would be limited to avoidance behavior in response to movements, noises, and shadows caused by construction personnel and equipment operating in or adjacent to the water body.

Although construction activities are scheduled to occur year-round under all build alternatives, most of the activities that are likely to cause the greatest disturbance to fish would occur during the in-channel construction season (June 15th to October 15th), thereby avoiding the most sensitive juvenile life stage and the primary migration periods of adult and juvenile coho salmon in the BSA. However, juvenile coho salmon may be present in the BSA during this period and therefore subject to disturbance.

Similar to turbidity and suspended sediment, noise and visual disturbances are expected to have only temporary effects on the behavior and distribution of fish. However, because of the nighttime work that may be required to meet the schedule, the use of artificial lighting is expected to result in a risk of predation for juvenile coho salmon and other salmonids that may be migrating or residing in the BSA. In addition to restricting in-channel construction activities from June 15th to October 15th, Caltrans proposes to minimize the use of artificial lighting to the extent practicable by limiting nighttime construction activities in or near the river to critical activities, directing light to only those locations that are actively under construction and/or satisfy safety requirements, and using deflectors to direct light away from the river channels where possible.

Caltrans anticipates that small numbers of juvenile coho salmon in the immediate vicinity of construction activities may leave protective cover in response to general construction noise and visual disturbances, potentially resulting in an increased risk of predation or competition for food or space if displaced to occupied habitat outside the areas of disturbance. Based on the general distribution of juvenile coho salmon residing in their natal streams and non-natal habitat during the summer (including the mainstem Smith River), the percentage of the population that may be exposed to such disturbance during each construction season is expected to be very small. Any juveniles (smolts) that may be migrating past the construction site after June 15th or adults that may be migrating past the site before October 15th may experience temporary delays in migration; however, any delays in migration are likely to be brief given the intermittent nature of construction activities and the timing of activities outside of peak migration periods.

Direct Injury

Small numbers of juvenile coho salmon could be injured or killed by direct contact with construction equipment or materials. The potential for harm is highest for juveniles residing near the margins of the river where they could be crushed or buried during placement of the temporary gravel berm. Few, if any, juveniles are expected to be present in these areas during gravel berm installation because the shoreline would be cleared of vegetation and other sources of hiding or cover before the temporary gravel berm installation. In addition, a qualified biologist would be present to ensure the contractor places the barriers and gravel fill in the river using a slow, incremental process that would allow juvenile salmonids to flee the area and avoid direct harm. Juvenile egress would be facilitated by initiating placement of the barriers and gravel at the upstream end of the gravel berm and working downstream while leaving the downstream end open to the river until the gravel berm is completed. The temporary gravel berm would not span the entire river so access upstream and downstream of the work area would be available. Displacement of fish from the temporary gravel berm areas is not expected to affect survival or growth because of the availability of suitable rearing habitat (vegetated channel margins) outside the affected areas.

Fish capture and relocation is proposed as part of the cofferdam installation under all build alternatives. In accordance with the Aquatic Species Relocation Plan (see *Project Features, Standard Measures and Best Management Practices*), Caltrans proposes to implement fish exclusion and/or relocation measures subject to the results of the pre-construction surveys and determination of appropriate measures by a qualified fish biologist. While fish relocation avoids potential harm, fish relocation activities themselves can harm fish. The amount of unintentional injury or mortality attributable to fish capture and handling varies widely depending on the method used, stream conditions, and the expertise and experience of the field crew. Fish collecting gear, whether passive or active poses some risk to individuals, including stress, disease transmission, injury, or death. In addition, relocated fish may be subject to increased predation risk or impaired growth because of competition with other fish and displacement to less favorable habitat (Hayes et al. 1996, Keeley 2003, Ward et al. 2007).

Data on fish relocation efforts from clear water diversion activities since 2004 shows most average mortality rates are below three percent for salmonids (Collins 2004, Hulbert 2013). Given the measures that would be implemented to minimize impacts from capture and relocation, Caltrans expects no more than three percent of all relocated fish would be subject to potential injury or mortality during each construction season.

Fish Passage

Under all build alternatives, construction areas in the Smith River would be accessed using temporary gravel berms during each in-channel construction season (June 15th to October 15th). Temporary gravel berm configurations would change each year depending on in-water construction activities. The estimated temporary gravel berm footprints and volume of gravel required under each build alternative are provided in Chapter 1, *Proposed Project*.

Constriction of the flow resulting from gravel berms would result in increased flow velocities through the open channel, presenting a potential migration barrier or impediment to upstream migrating adult salmonids and other fish species. Although the temporary gravel berms would be removed each year before the peak migration periods of adult coho and other anadromous salmonids, a small proportion of returning adults may be ascending the lower river before October 15th (Larson 2013), and therefore may potentially experience delays as they attempt to pass the construction site.

Under all build alternatives, hydraulic modeling of flow velocities under existing conditions and with the temporary gravel berm in place (based on two general configurations assumed for construction and demolition seasons) indicates that the maximum (5 percent exceedance values) water velocities in the narrowed channel (over the mussel bed) under summer low flow conditions would increase from 0.6 feet per second under existing conditions to a range of 2.2 to 3.8 feet per second under summer low flow conditions, and from 2.7 feet per second under existing conditions to a range of 6.5 to 7.3 feet per second (Caltrans 2019c). This represents the maximum velocities that adult salmon would potentially face for approximately 100 feet (maximum width of the gravel berm) as they pass the construction site. Bell (1991) reported that cruising speeds for adult coho salmon range up to 4 feet per second, sustained speeds range up to 10 feet per second, and darting speeds range up to 22 feet per second. While adults may be delayed in passing the construction site under the highest velocities predicted to occur at the site, these velocities are within the range of sustained swimming speeds (speeds that can be maintained for several minutes) and therefore would not present a barrier to adults that may encounter these conditions.

Although downstream passage for juvenile coho would be maintained, the altered physical and hydraulic conditions associated with the narrowed channel may increase the vulnerability of juveniles to predators. The use of artificial nighttime lighting could compound this risk. Potential adverse effects on juvenile coho salmon would be minimized by installing the temporary gravel berm after June 15 and removing the berm before October 15, thereby avoiding the primary juvenile and adult migration periods in the BSA. Additionally, juveniles would be expected to be rearing upstream and downstream of the construction footprint in vegetated areas along the banks, thus avoiding areas of higher water velocity.

Debris Loading

During the construction period, fish passage may also be affected by the presence of temporary trestle piles that would remain in the river through the winter-spring seasons under all build alternatives. As noted in the project description, the vertical trestle piles (24- or 30-inch steel shell piles or H-piles) would remain in the river year-round but the deck and cross-beams (i.e., stringers) and all falsework piles would be removed prior to the winter season. Potential effects of the trestle piles include physical obstruction and adverse hydraulic conditions resulting from high flows and wood/debris racking and accumulation within the active river channel. Before winter and spring, when high flows are capable of transporting large woody debris, the gravel work pads would be removed to restore the conveyance capacity of the channel.

The potential for large debris to be transported by the Smith River through the BSA mostly occurs in the winter and/or during high flow events. Temporary in-water structures could trap downstream movement of debris. Caltrans previously reviewed the debris loading history at Dr. Fine Bridge and the Hiouchi Bridge on SR 199 and found that debris accumulations have been minor (Caltrans 2016c). At Dr. Fine Bridge, periodic maintenance was performed several times between 1956 and 2007 to remove debris from the piers, and records indicate that debris accumulation was minimal during this period. Maintenance records report a variety of drift accumulated on the bridge piers, from small branches to large logs. Review of the debris loading history at Dr. Fine Bridge and the Hiouchi Bridge on SR 199 also indicated there has been a consistent decrease in the occurrence of floating debris from the 1980s to the present. This is probably due to changes in timber harvest practices and more stringent controls on instream mining (Caltrans 2016c). Nevertheless, as the largest undammed river system in California, the Smith River has the potential for large flow events in any year and resulting large woody debris carried downstream through the watershed.

Under all build alternatives, construction trestle piles would remain in the river year-round for the duration of the project. However, the deck and cross beams (i.e., stringers) and all falsework piles would be removed prior to the winter season. Under Alternative 3, the temporary detour bridge would require piers in the river channel over winter. The Jack and Slide construction technique for Alternative 3A would require three temporary detour foundations in the wetted channel, supported on two 48-inch cast-in-drilled-hole (CIDH) piles each. In contrast, Alternative 3B, the Panel Bridge Detour option, would require two temporary foundations in the wetted channel supported on two 16-inch CIDH piles each that would remain over winter.

Under Alternatives 1 and 3, falsework needed to temporarily support the bridge superstructure construction would be installed at the beginning of the in-water construction season, would be in place until the bridge is cured, and is anticipated to come out before October 15. Under Alternative 2, temporary slicing towers erected to allow construction of the pre-cast girder superstructure also are anticipated to be removed by October 15. Therefore, no falsework or falsework supports would remain in the channel over the winter. The construction approach for the superstructure under all build alternatives differs from the approach presented in the 2017 IS/EA, which assumed falsework would remain in the river channel over winter.

The hydraulic analysis completed for the alternatives evaluated changes in flow patterns, velocities, and shear stress during winter/spring and summer flow events for each alternative. During winter storms, large floating debris or “drift” could accumulate on in-water structures such as trestle piles and temporary detour foundations.

Under Alternative 3A (Jack and Slide Detour), temporary detour bridge foundations would support 180-foot spans founded on three temporary piers in the wetted channel, which would be constructed immediately upstream of and in line with existing bridge piers. Spacing of the Alternative 3A temporary detour bridge piers is consistent with the existing bridge piers, so the temporary bridge would not narrow the channel width for floating logs. Under Alternative 3B (Panel Bridge Detour), two temporary piers would be needed in the wetted channel to support a span length of 210 feet. Therefore, the spacing of the temporary panel bridge would be greater than the existing bridge piers and would accommodate the width of floating logs passing through the project area. The soffit elevation of the temporary detour bridge under either Alternative 3A (Jack and Slide) or Alternative 3B (Panel Bridge) would be at or higher than the soffit elevation of the existing bridge. The current bridge has a soffit elevation of 52 feet. The Alternative 3A Jack and Slide Detour would have a soffit elevation of 52 feet and the Alternative 3B Panel Bridge Detour would have a soffit elevation of 63.5 feet. As a result, available space for floating debris to pass under the temporary bridge would be greater than or the same as existing conditions. Therefore, the temporary bridge would provide adequate freeboard for large floating debris to pass under the bridge, and the temporary pier spacing would not constrict debris passage when compared to existing conditions. Therefore, the temporary bridge would not substantially change hydraulic conditions that would lead to significant debris loading.

Caltrans will require the contractor to prepare and implement a Debris Management Plan. This plan would require the contractor to conduct regular inspections of the construction site as well as after major storm events to monitor debris loading and implement measures, as determined feasible, to remove debris that poses a threat to temporary and permanent infrastructure and channel/bank stability. Measures would include the use of onsite equipment (e.g., cranes) to dislodge or remove debris that is caught on the temporary and permanent piles. Debris removal would not occur under high flow conditions that pose safety risks.

Pile Driving and Demolition Noise

Pile driving noise has received increased attention in recent years because of its potential to cause direct injury or mortality of fish and other aquatic animals. Factors that may influence the magnitude of effects include species, life stage, and size of fish; type and size of pile and hammer; frequency and duration of pile driving; site characteristics (e.g., depth of water); and distance of fish from the source. Dual interim criteria representing the acoustic thresholds associated with the onset of physiological effects in fish have been established to provide guidance for assessing the potential for injury resulting from pile driving noise (Fisheries Hydroacoustic Working Group 2008) (Table 2-21). These criteria have been established for impact pile driving only.

The dual criteria are 1) 206 dB for peak sound pressure level (SPL); and 2) 187 dB for cumulative SEL for fish larger than 2 grams, and 183 dB SEL for fish smaller than 2 grams. The peak SPL threshold is considered the maximum sound pressure level a fish can receive from a single strike without injury. The cumulative SEL threshold is considered the total amount of acoustic energy that a fish can receive from single or multiple strikes without injury. The cumulative SEL threshold is based on the total daily exposure of a fish to noise from sources that are discontinuous (in this case, noise that occurs up to 12 hours a day, with

12 hours between exposures). This assumes that fish are able to recover from any effects during this 12-hour period.

Table 2-21. Interim Criteria for Assessing the Potential for Injury to Fish from Pile Driving Activities

Interim Criteria	Agreement in Principle
Peak Sound Pressure Level (SPL)	206 dB re: 1µPa (for all sizes of fish)
Cumulative Sound Exposure Level (SEL)	187 dB re: 1µPa2-sec (for fish ≥ 2 grams) 183 dB re: 1µPa2-sec (for fish < 2 grams) 183 dB re: 1µPa2-sec—for fish size < 2 grams

µPa = micro-Pascals, a standard unit of acoustic pressure
dB = decibels, a unit of sound intensity
dB re: 1µPa = a measurement of sound intensity referenced to a standard pressure unit
Source: Fisheries Hydroacoustic Working Group (2008)

Among the construction activities likely to generate noise during replacement of the bridge, the use of impact hammers for pile installation or demolition poses the greatest risk to fish because the levels of underwater noise produced by impulsive types of sounds often reach levels of sufficient intensity to injure or kill fish (Popper and Hastings 2009). Other pile driving methods such as vibratory, oscillatory, and drilling methods generally produce more continuous, lower energy sounds below the thresholds associated with injury. There are currently no established noise thresholds associated with continuous sound waves, and vibratory and oscillation methods are generally considered effective measures for avoiding or minimizing the risk of injury of fish from pile driving noise.

Caltrans completed a hydroacoustic assessment for the project (Caltrans 2017d, 2019k), which uses a model developed by NMFS to calculate sound from pile driving activities and the distance from piles that sound attenuates to the peak or cumulative criteria. The reports provide additional details on the methods and results of these analyses, including the location, number of piles, strikes per day, and distances to the injury and behavioral thresholds for each of the pile driving activities under Alternative 3A (Caltrans 2017d) and Alternative 1 (Caltrans 2019k).

Table 2-22 compares the pile installation and related activities under each alternative. The estimates of size, number, and location of pile driving activities are based on preliminary design and reasonable construction assumptions; the exact scheduling and methods of construction activities would be determined by the contractor.

Table 2-22. Pile Driving Requirements for Each Build Alternative

Project Component		Estimated Number of Piles			
Location	**Pile Type**	**Alternative 1**	**Alternative 2**	**Alternative 3A**	**Alternative 3B**
New Bridge					
Abutment 1	Driven steel H-pile	44	44	44	44
Pier 2, 3, and 4	96” Diameter CIDH concrete pile with permanent steel casing	6 (2 per pier)	N/A	6 (2 per pier)	6 (2 per pier)
Pier 2, 3, 4, 5, and 6	84” Diameter CIDH concrete pile with permanent steel casing	N/A	10 (2 per pier)	N/A	N/A
Abutment 5	36” Diameter CIDH concrete pile with permanent steel casing	10	N/A	10	10
Abutment 7	36” Diameter CIDH concrete pile with permanent steel casing	N/A	10	N/A	N/A
Abutment 1 and 5	Steel sheet pile	30	N/A	N/A	N/A
Abutment 1 and 7	Steel sheet pile	N/A	30	N/A	N/A
South Viaduct/Approach					
Abutment 1	Driven steel H-pile	34	34	N/A	N/A
Piers 2, 3, and 4	36” CIDH concrete pile	6 (2 per pier)	6 (2 per pier)	N/A	N/A
South viaduct walls	H piles in 36” diameter drilled hole	168	168	N/A	N/A
South embankment walls	H piles in 36” diameter drilled hole	N/A	N/A	50	50
North Viaduct/Approach					
Piers 1, 2, 3, and 4	36” CIDH concrete pile	8 (2 per pier)	N/A	N/A	N/A
Piers 1, 2, ,3, 4, and 5	36” CIDH concrete pile	N/A	10 (2 per pier)		
Abutment 6	Driven steel H-pile	34	34	N/A	N/A
North viaduct wall	H piles in 36” diameter drilled hole	87	87	N/A	N/A

Project Component		Estimated Number of Piles			
Location	**Pile Type**	**Alternative 1**	**Alternative 2**	**Alternative 3A**	**Alternative 3B**
North embankment wall	H piles in 36” diameter drilled hole	N/A	N/A	88	88
Falsework Construction					
Season 2 Bridge construction	Steel H-pile vibrate 70’, drive 5’	18	14	18	18
Equipment Trestle Construction					
Season 1 Bridge Demo or Bridge Deck Sliding	Steel H-pile vibrate 70’, drive 5’	N/A	N/A	6 (bridge sliding)	6 (bridge demo)
Season 2 New Bridge Construction	Steel H-pile vibrate 50’, drive 5’	6	6	6	6
Season 3 Bridge Demo	24” Steel pipe vibrate 70’, drive 5’	6	6	N/A	N/A
Bridge Demolition: Coffer Dams to Remove Existing Foundations					
Pier 13, 14, and 15	Steel sheet pile vibrate 100%	60	60	60	60
Jack and Slide Transition Beam Supports					
Pier 13, 14, and 15	Steel H-pile vibrate 70’, drive 5’	N/A	N/A	12 (4 per pier)	N/A
Detour Bridge					
Abutment 1 to 3	Steel sheet piles	N/A	N/A	57	57
Abutment 1	Driven steel H-pile	N/A	N/A	6	6
Pier 2 and 3	36” diameter CIDH pile	N/A	N/A	2 (1 per pier)	2 (1 per pier)
Abutment 3	Driven steel H-pile	N/A	N/A	6	6
Bent 4, 5, 6, and 7	36” diameter CIDH pile	N/A	N/A	8 (2 per pier)	N/A
Piers 8, 9, 10, 11, and 12	Steel HP piles Vibrate to bedrock, drive 5’	N/A	N/A	90	N/A
Piers 13 and 14	36” diameter CIDH pile	N/A	N/A	4 (2 per pier)	N/A
Abutment 15 and 16	Driven steel pipe pile	N/A	N/A	12	12

Project Component		Estimated Number of Piles			
Location	**Pile Type**	**Alternative 1**	**Alternative 2**	**Alternative 3A**	**Alternative 3B**
Bent 15	36” diameter CIDH pile	N/A	N/A	1	
Abutment 15 to 16	Steel Sheet pile	N/A	N/A	22	22
Piers 4, 5, 6, 7, 8, 9, and 10	36” diameter CIDH pile	N/A	N/A	N/A	14 (2 per pier)
Pier 11	36” diameter CIDH pile	N/A	N/A	N/A	3
Piers 12 and 13	Steel HP piles Vibrate to bedrock, drive 5’	N/A	N/A	N/A	24 (12 per pier)
Pier 14	36” diameter CIDH pile	N/A	N/A	N/A	3
Pier 15	36” diameter CIDH pile	N/A	N/A	N/A	1
Total Number of Piles		517	509	508	438
Total Number of Driven Piles*		142	138	194	116

* Total number of driven piles excludes CIDH piles, sheet piles, and oscillated piles.
Note: Number of piles, pile type, and assumed installation methods are preliminary; final methods for installing all temporary construction structures will be determined by the contractor. This information is presented for alternatives comparison purpose.

In addition to the pile driving and drilling activities listed in the table, removal and demolition of the existing bridge would use hydraulic hammers (i.e., hoe ram), which also has the potential to generate underwater noise levels of sufficient intensity to cause direct injury or mortality of fish.

Table 2-23 summarizes the pile driving and demolition activities (location, timing, and duration) that have the potential to generate underwater noise levels of sufficient intensity to cause direct injury or mortality of fish in the Smith River. The hydroacoustic reports (Caltrans 2017d, 2019k) provide more detail on the methods and assumptions used in the analyses. Based on uncertainties in site conditions potentially encountered during pile driving operations (e.g., bed resistance), the hydroacoustic analysis assumed that approximately half the length of each pile can be installed using vibratory pile driving, with impact driving used to drive the remaining half. However, as noted in Table 2-22, piles typically would be vibrated to more than half of needed length and driven the last 20–30 percent. The computed distances over which pile driving sounds are expected to exceed the injury and behavioral thresholds assume an unimpeded sound propagation path. However, site conditions such as shallow water, major channel bends, and other in-water structures can reduce these distances by impeding the propagation of underwater sound waves.

Under all build alternatives, underwater noise produced by impact pile driving and demolition activities are expected to periodically reach levels that exceed the injury thresholds for fish in the Smith River. The potential for injury of fish would occur within 377 to 1,476 feet of the temporary trestle and falsework piles during a 6-day installation period in two of the summer construction seasons (June 15 to October 15), and within 141 to 351 feet of the existing bridge piers during a 40-day demolition period in the third summer construction season. Alternative 3A differs from Alternatives 1 and 2 in that impact pile driving would also likely be used to install the detour structure, potentially resulting in injury of fish within 121 to 226 feet of the south approach piles during a 2-day installation period in the first winter construction season, and within 102 to 823 feet of the jack-and-slide support piles during a 3- to 4-day installation period in the first summer construction season. Under Alternative 3B, the potential for injury of fish from pile driving and demolition noise would be the same as Alternative 3A except Alternative 3B would not require construction of a jack-and-slide transition beam structure.

Table 2-23. Summary of Pile Driving and Demolition Activities with Potential to Exceed Injury Thresholds for Fish

Activity	Location	Approximate Timing	Approximate Duration (days)	Alternative 1	Alternative 2	Alternative 3A	Alternative 3B
Detour Structure Approaches							
Impact driving for south approach of detour structure	On land	January 1 - March 31	2			✓	✓
Construction Trestles							
Impact driving of 24- or 30-inch steel pipe piles for construction trestle over mussel bed	On land and in water	June 15 - June 30	2	✓	✓	✓	✓
Jack and Slide Transition Beam Supports							
Impact driving of 24-inch steel pipe piles or 12x58-inch H-Piles for Jack and Slide structure	On land and in gravel berm	September 1 - September 30	3-4			✓	
Falsework for Bridge Construction							
Impact driving of 24- or 30-inch steel pipe piles for falsework over mussel bed	On land and in water	June 15 - June 30	4	✓	✓	✓	✓
Bridge Demolition							
Use of hoe rams to demolish existing bridge Piers 12-19	In gravel berm and on land	June 15 - October 15	40	✓	✓	✓	✓

To minimize the potential for injury, Caltrans would implement Project Features, Standard Measures, and Best Management Practices to minimize potential noise effects on fish. Caltrans proposes to conduct all in-channel pile driving and demolition activities during June 15-October 15 to avoid the primary salmon migration seasons and most sensitive life stages of juvenile salmon (young-of-the-year) that may be moving downstream or residing in the BSA during spring. However, juvenile coho salmon may continue to emigrate or rear in the BSA after June 15 and therefore be subject to potential injury from pile driving and demolition noise during the summer construction season. No data are available to predict the number of juveniles that may be present at the time of these activities, but it would likely be a small fraction of the total numbers of juveniles moving downstream or residing in the lower mainstem of the river based on general survey information and the small scale of potential impacts relative to the total amount of potential habitat in the lower mainstem and estuary of the Smith River. Under summer flow conditions, project site characteristics that would likely impede the propagation of pile driving noise and limit the exposure of fish to noise levels exceeding the injury and behavioral thresholds include the temporary gravel berm and the natural riffles both upstream and downstream of the project site.

Additional measures proposed by Caltrans to limit exposure of fish to potentially harmful underwater sound levels include limiting the use of impact driving and hoe ram operations to the extent practicable, and applying attenuation methods (e.g., bubble curtains) where feasible. In addition, Caltrans would minimize the potential for adverse effects by limiting impact driving to daylight hours (avoiding peak migration periods at night) and providing a minimum of 12 hours cessation of impact driving to permit recovery of any fish that remain within the affected areas for more than one day. Hydroacoustic monitoring would be conducted to ensure compliance with the terms and conditions resulting from Section 7 Endangered Species Act Consultation with NMFS and CDFW CESA permitting, and provide an opportunity to adopt alternative construction methods to avoid or minimize project impacts where feasible.

Coho Critical Habitat

The proposed action would result in temporary and permanent impacts on the PBFs of coho critical habitat, including impacts on riparian and riverine habitat that support juvenile rearing and adult and juvenile migration.

Riparian vegetation directly influences the quality of salmonid habitat—affecting cover, food, habitat complexity, streambank stability, and water temperature. Riparian vegetation and large woody debris play important roles in stabilizing stream channels and creating and maintaining diverse high-quality habitats for salmonids and other fish (Dolloff and Warren

2003). Within the project area, riparian vegetation provides several important functions that benefit coho salmon and other fish including bank stabilization, cover/shelter, velocity refuge, water quality functions, and a source of food and nutrients to the stream.

Clearing of vegetation to construct access roads, stream channel/drainage crossings, road cut and fill, retaining walls, viaducts (Alternatives 1 and 2 only), and approaches to the detour bridge (Alternative 3 only) would result in temporary and permanent losses of riparian vegetation. Temporary losses of riparian vegetation are expected to have minimal effects on the function of the lower Smith River as a migratory corridor and rearing area for SONCC coho salmon. No substantial impacts would occur to off-channel rearing habitats and temporary losses would be limited to shoreline areas representing a small fraction of the total riparian cover in the lower Smith River. Although restoration of site values may take many years, the small losses of riparian vegetation are not likely to have significant effects on water temperature and only minor effects on the cover/shelter, food, and other functions of riparian vegetation in the lower Smith River.

Section 2.3.1, *Natural Communities*, summarizes project impacts on riparian habitat under each build alternative. Alternatives 1 and 2 would temporarily affect approximately 0.47 acre more riparian habitat than Alternative 3 and would permanently affect approximately 0.22 acre more riparian habitat than Alternative 3. Caltrans proposes to mitigate temporary losses of riparian vegetation through implementation of standard measures that include a revegetation and monitoring plan. All temporarily cleared or disturbed areas would be planted with native riparian vegetation. Permanent impacts include the loss of riparian vegetation within the footprints of new bridge piers, approaches, viaducts, and retaining walls. The removal of the existing piers and the viaduct on the south shore is expected to provide additional planting areas to help offset these losses. In addition, Caltrans anticipates pursuing compensatory on- and off-site mitigation for impacts on wetlands and other waters. The appropriate measures for off-site mitigation, including mitigation ratios, would be identified and coordinated through the appropriate regulatory agencies.

Installation of the temporary gravel berm each summer would result in seasonal losses of open water and benthic habitat. The placement of gravel fill in these areas during the June 15^{th} to October 15^{th} construction season would result in a temporary reduction in summer rearing habitat through the loss of physical habitat (space), substrate, and food producing areas (macroinvertebrate production). Small temporary losses of open water and benthic habitat would also occur from the placement of temporary piles for the construction trestle, detour structure (Alternative 3 only), and falsework piles. Temporary losses of riverine habitat resulting from placement of the gravel berm and temporary piles are not likely to have substantial effects on the overall quantity or quality of rearing habitat available to juvenile coho and other salmonids in the lower Smith River. Furthermore, replacement of the existing bridge with the proposed new bridge would result in a net increase in the availability of open water habitat following completion of the project because of the smaller number and reduced overall footprint of in-channel piers under all build alternatives compared to existing conditions.

Installation of the temporary trestles under all build alternatives and detour structure under Alternative 3 would result in temporary increases in the extent of shading over the river during construction. However, it is unlikely that the proposed changes in light levels associated with the temporary structures would have any measurable effect on water temperature, primary production, or holding and rearing habitat for fish because of the temporary nature and small scale of these effects. Following completion of the project, replacement of the existing bridge with the proposed new bridge would create slightly more shade due to the greater width of the new bridge. However, this change would result in no substantial increases in the extent of shading over the Smith River and adjacent riparian zone and no significant long-term effects on the function of salmonid habitat in the BSA.

In conclusion, temporary and permanent impacts on the designated critical habitat of coho salmon would be limited to small, localized impacts on the PBFs supporting freshwater rearing and migration. With implementation of the standard minimization and avoidance measures and proposed mitigation measures to compensate for impacts on riparian vegetation, no substantial impacts on the designated critical habitat or the conservation value of critical habitat for SONCC coho salmon would occur.

Longfin Smelt

Under all build alternatives, in-river construction activities would not commence until mid-June. Effects on longfin smelt during spawning would not be anticipated since spawning occurs primarily from January through March, after which most adults die, and larvae are quickly swept downstream into brackish water. Since longfin smelt is not likely to be in the project area during the summer, effects on the species are not anticipated because in-water activities are limited to June 15 through October 15. On the off-chance longfin smelt are present in the BSA during in-river construction activities, *Project Features, Standard Measures, and Best Management Practices* would minimize harm. For example, hydroacoustic monitoring and fish relocation from cofferdams would aid in reducing potential effects on the species.

Eulachon

Eulachon are not expected to be present in the Smith River within the BSA considering they have rarely been documented in the river. Under all build alternatives, in-river work activities would take place during the summer months after eulachon have finished spawning. On the off-chance eulachon are present in the BSA during in-river construction activities, *Project Features, Standard Measures, and Best Management Practices* would minimize harm.

Essential Fish Habitat

Water quality may be temporarily impaired due to short term, localized increases in turbidity from activities that involve ground disturbance, or by contaminants in roadway storm water runoff or accidental spills during construction, which could potentially compromise safe passage conditions for fish migration and reduce the quality of localized rearing habitat. However, the *Project Features, Standard Measures, and Best Management Practices* to protect water quality would minimize the magnitude and duration of any turbidity increases, provide for site stabilization post construction, and ensure proper handling and storage of contaminants to avoid accidental spills.

Cover/shelter, foraging potential, and safe passage conditions may also be temporarily compromised due to noise (e.g., vibration from construction equipment, hoe-ramming) and visual stressors (e.g., artificial light, sudden movements) during construction near or over the project watercourses. With incorporation of the measures designed to limit disturbance (e.g., use of ESA fencing, limited operation period, hydroacoustic monitoring/abatement), and given that available cover/shelter, foraging potential, and safe passage conditions would be restored to baseline levels upon completion of construction, it is expected there would only be minor, localized, and/or short-term effects on these EFH elements.

The slightly wider bridge configuration under all build alternatives would result in a small incremental increase of permanent shading of the Smith River, which may result in a minor reduction of primary production in waters and/or emergent vegetation growing along the shoreline. There would also be a small temporal loss and even smaller permanent loss of vegetation that provides riparian function. The scale of these effects would not result in a measurable decrease in the quality of the rearing habitat or migration corridors for EFH species. These modifications to EFH would be somewhat offset by the increase of river habitat available because of the decrease in permanent piers in the river.

Coho salmon and Chinook salmon may avoid the reach of the river under Dr. Fine Bridge to some extent due to underwater noise and other visible activity, as well as the lack of riparian vegetation removed for trestle access. Due to the multi-year construction period for all build alternatives, during which EFH within and adjacent to the project site would be compromised for coho salmon and Chinook salmon, the project may adversely affect EFH for both species. However, no measurable, long term permanent impacts on waters, substrates, food production and availability, and cover conditions from increased shading or vegetation removal would be expected; therefore, the project is not anticipated to result in a long-term reduction in coho salmon or Chinook salmon EFH. With avoidance, minimization and mitigation measures listed below, there is no adverse effect to EFH anticipated.

2.3.4.4 Avoidance, Minimization, and/or Mitigation Measures

Species-1: Biological Monitor during In-stream Work (*described in Section 2.3.3*)

Species-4: Preconstruction Survey for Amphibians and Reptiles (*described in Section 2.3.3*)

Species-5: Aquatic Species Relocation (*described in Section 2.3.3*)

Species-6: Seasonal In-Stream Restrictions (*described in Section 2.3.3*)

Species-7: Hydroacoustic Monitoring (*described in Section 2.3.3*)

Species-8: Pile Driving (*described in Section 2.3.3*)

Coho-1. CESA stipulates that take (resulting in mortality) of a state listed species must be fully mitigated. Therefore, due to the likelihood of the project resulting in take of coho salmon, full mitigation would occur. To fully mitigate for take of coho salmon that may result from this project, Caltrans would improve fish passage at a site deemed acceptable to CDFW. A possible candidate for mitigation is the remediation of the culvert that carries Dominie Creek under Highway 101 at Post Mile 39.8. Dominie Creek (Del Norte County, Route 101, post mile 39.78) is a tributary to Rowdy Creek, which flows into the Smith River approximately 2.8 river miles downstream of the project. Caltrans has worked with CDFW to create a priority list of known fish passage barriers located on the State Highway System. That list is used to prepare an annual report to the California State Legislature that documents Caltrans' efforts to assess and remediate locations statewide. The 2015 report, which documents data for year 2014, listed Dominie Creek as the top fish passage remediation project for Del Norte County and one of the top priority projects for Caltrans' District 1 (Caltrans 2016). The 2016 report lists Dominie Creek as an Active Fish Passage Remediation Location since it is being proposed as fish passage mitigation for the Dr. Fine Bridge Replacement Project.

Due to exposed rebar and a damaged weir at the outlet apron, fish passage is obstructed in Dominie Creek, blocking an estimated 8,400 feet of upstream habitat. Low water depths, high velocities, and a 2-foot-high perched outlet weir limit fish passage in the creek.

The Dominie Creek project proposes to remove the existing box culvert and install an 80-foot span bridge to provide a stream width of 30 feet. This includes a re-profile of the stream bottom to minimize head-cutting and provide an unobstructed stream, which would allow fish access to approximately 8,400 feet of upstream habitat.

Channel reconstruction would extend approximately 40 feet of channel downstream through the culvert to approximately 100 feet upstream and provide addition of grade control structures and stabilization of the stream bank. The exact length of stream reconstruction would be dependent on the type of grade control structures or rock weirs that are designed to stabilize the channel and meet current fish passage standards.

Caltrans received the NMFS' final biological opinion and EFH consultation for the Dominie Creek Fish Passage Project on October 22, 2018 (NMFS 2018). NMFS concludes that the action (Dominie Creek Fish Passage Project), as proposed, is not likely to jeopardize the continued existence of the SONCC coho salmon ESU. The action is also not likely to destroy or adversely modify designated critical habitat for the SONCC coho salmon ESU. NMFS expects the proposed action would result in incidental take of SONCC coho salmon. Documents related to the Dominie Creek Fish Passage Project are provided in Appendix G.

Prior to any project activities that could incidentally take SONCC coho salmon, Caltrans will provide CDFW with written documentation that Caltrans has allocated sufficient funds, acceptable to and approved by CDFW, in the Expenditure Authorization for the project to ensure implementation of all measures to minimize and address the incidental take of SONCC coho salmon.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.3.5 Invasive Species

2.3.5.1 Regulatory Setting

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

Some invasive plants are also considered noxious weeds. A noxious weed is a plant that has been defined by California Department of Food and Agriculture (CDFA) as a pest by law or regulation. California maintains lists of plants that are considered threats to the well-being of the state or the country. When CDFA lists a species, it also receives a rating of A, B, C, D, or Q. These ratings reflect CDFA's view of the statewide importance of the pest, the likelihood that eradication or control efforts would be successful, and the present distribution of the pest within the state. The ratings are not laws but are policy guidelines that indicate the most appropriate action to take against a pest under general circumstances.

A 'B' rated plant is a pest of known economic or environmental detriment and, if present in California, is of limited distribution. B-rated pests are eligible to enter the state if the receiving county has agreed to accept them. If found in the state, they are subject to state endorsed holding action and eradication only to provide for containment, as when found in a nursery. At the discretion of the individual county agricultural commissioner, they are subject to eradication, containment, suppression, control, or other holding action.

A 'C' rated plant is a pest of known economic or environmental detriment and, if present in California, is usually widespread. C-rated organisms are eligible to enter the state as long as the commodities with which they are associated conform to pest cleanliness standards when found in nursery stock shipments. If found in the state, at the discretion of the individual county agricultural commissioner, they are subject to regulations designed to retard spread or to suppress. There is no state enforced action other than providing for pest cleanliness.

2.3.5.2 Affected Environment

The following noxious weeds, listed below with their respective California weed rating, were observed within the BSA:

- Scotch Broom *(Cytisus scoparius)* – C-list noxious weed
- French Broom *(Genista monspessulana)* – C-list noxious weed
- St John's-wort *(Hypericum perforatum)* – C-list noxious weed
- Stinking Willy *(Senecio jacobaea)* – B-list noxious weed

The invasive New Zealand Mudsnail (NZMS) (*Potamopyrgus antipodarum)* has been found downstream of the BSA near the mouth of the Smith River and Rowdy Creek. NZMS has no natural predators or parasites in the United States and consequently has become an invasive species. It can reach concentrations greater than 500,000 per m^2, endangering the food chain by outcompeting native snails and water insects for food resulting in declines in native populations (CDFW no date). Fish populations then suffer because the native snails and aquatic invertebrates are their main food source.

The spatial extent of the NZMS in the Smith River is minimal and restricted to the coastal plain (Parrish and Garwood 2015); therefore, presence of NZMS near Dr. Fine Bridge is unlikely.

Chytridiomycosis is an emerging infectious disease of amphibians caused by an aquatic fungal pathogen, *Batrachochytrium dendrobatidis* (*Bd*) (Daszak et al. 2004) that was first reported causing mass mortality associated with population declines in Central America and Australia (Berger et al. 1998). Outbreaks of chytridiomycosis are often characterized by simultaneous die-offs of multiple amphibian species at affected sites. The fungus infects the superficial, keratin-containing layers of amphibian skin (Berger et al. 1998). In amphibians, the skin is one of the most important organs, involved in respiration, hydration, osmoregulation, and thermoregulation. Chytridiomycosis infection also generally leads to hyperkeratosis (“thickening” of the outermost keratinized layer of the skin, which may range up to 30 times thicker than normal [Berger et al. 1998]).

Batrachochytrium dendrobatidis appears to be affecting frogs more than salamanders. For frogs, species that live and/or breed in permanent water (particularly streams) at higher elevations appear to be the most susceptible. *Bd* has been found on all continents where amphibians occur, Antarctica being the only excluded continent (Fisher et al. 2009). A Citizen Science project surveyed sites in Humboldt Bay National Wildlife Refuge and

Redwood National and State Parks (Pope et al. 2016). The locations surveyed are in coastal Humboldt County and support a diversity of freshwater habitats where red-legged frogs have been found infected with *Bd*. Twenty-six of 155 (17%) skin swabs and buccal swabs for four species of frogs and toads sampled were found to be positive for *Bd*. It is unknown if *Bd*. occurs in amphibian populations associated with the Smith River and its tributaries.

Sudden oak death (SOD) is a disease of oak trees caused by an invasive plant pathogen, *Phytophthora ramorum*. It currently occurs primarily in coastal California counties from Monterey to Humboldt, but is also known to occur in Del Norte County and a small portion of southwest Oregon. SOD can be spread by moving infested soil and plant materials. Tanoak and California bay are known SOD hosts.

Port Orford Cedar (*Chamaecyparis lawsoniana*) root disease is also known to be present in Del Norte County. It affects Port Orford cedar and can be spread by moving infested soil and trees. Port Orford cedar trees do not occur within the project BSA.

2.3.5.3 Environmental Consequences

Build Alternatives

Under all build alternatives, construction of the project could result in the introduction and spread of invasive plant species. Although the presence of NZMS near Dr. Fine Bridge is unlikely, equipment used in the river could potential result in the spread of this species. Similarly, disturbance and equipment used in aquatic habitat could contribute to the spread of *Bd.* If soils or plant materials infested with *Phytophthora ramorum* were moved to new areas as part of project tree removal, this could contribute to the spread of SOD. Implementation of *Project Features, Standard Measures, and Best Management Practices* address the spread of invasive species and pathogens.

2.3.5.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, no impact would occur.

2.4 Cumulative Impacts

2.4.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect 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.

Cumulative impacts on resources in the project area may result from residential, commercial, industrial, and highway development, as well as from logging, 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, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under NEPA can be found in 40 CFR 1508.7.

Section 15355 of the CEQA Guidelines defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. As defined in 40 CFR 1508.7 of the Council on Environmental Quality (CEQ) Regulations, a cumulative impact under NEPA is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

2.4.2 Affected Environment

Past, present, and reasonably foreseeable projects that may contribute to cumulative impacts include other roadway construction and development projects in Del Norte County. Projects reviewed for potential to contribute to cumulative effects include future Caltrans projects that have been funded on U.S. 101, SR 197, and U.S. 199 in Del Norte County; projects received by Caltrans through the Local Development Inter-Governmental Review (IGR) process; and Timber Harvest Plans and federal land activities in the Smith River Watershed.

Currently funded Caltrans projects that will be recently completed or potentially going to construction at the same time as the Dr. Fine Bridge Replacement Project are shown in Table 2-24 below.

Projects received by Caltrans for review through the Local Development Inter-Governmental Review process are shown in the table below (Table 2-25). The construction schedule for these projects is unknown.

In the Smith River watershed, logging operations are underway and planned on both public and private land. A majority of the watershed is under public ownership and is managed by agencies including USFS, NPS, and California State Parks. Logging on federal timberland in California follows national regulations, with practices including thinning and selective logging. Logging on private and corporate land in California is regulated through the Timber Harvest Plan (THP) process, carried out by California Department of Forestry and Fire Protection (CAL FIRE). THPs outline proposed logging operations and evaluate conformity to the silvicultural techniques defined in the California Forest Practice Rules. These techniques can include clear-cutting, in addition to thinning and selective logging. THPs are considered the “functional equivalent” of EIRs.

Table 2-24. Caltrans projects anticipated in Del Norte County

Route and Post Mile	Project Location	Type of Work	Estimated Start Work and Completion Dates
101; PM 8.2-8.7	Near Klamath at Panther Creek Bridge and at Hunter Creek Bridge	Replace Bridge	Start: December 2018 Est. Completion Date: Dec. 2021
101; PM 12.9-21.3	From 0.3 mile North of Wilson Creek Bridge To 1.5 miles South of Hamilton Rd	Reconstruct Drainage	Start: July 2018 Est. Completion Date: November 2019
101; 25.8-27.3	In and near Crescent City from 0.2 mile south of Elk Valley Road to 0.1 mile north of Wilson Ave & Burtchell St	Crescent City ADA	Start: May 2021 Est. Completion October 2021
197; PM 3.2-4.0	Near Fort Dick from 1.3 miles to 0.5 mi South of Ruby Van Deventer Park	Widen Roadway	(*currently on hold in litigation*)
197; PM 4.5	At entrance to Ruby Van Deventer Park	Widening	(*currently on hold in litigation*)
199, 1.11-2.8	.3 mile North of Elk Valley Cross Road to 0.2 mile south of Walker Rd	Culvert Rehabilitation	Start: May 2022 Est. Completion October 2021
199, 6.55- 36.3	Near Hiouchi .8 mile south of Myrtle Creek BR # 1-7 to .1 south of the Oregon State Line	Culvert Rehabilitation	Start: May 2021 Est. Completion: October 2021
199; PM 8.25	Near Hiouchi 1.0 mile North of South Fork Road	Smith River Curve Improvement	Start: November 2016 Est. Completion Date: December 2019
199; PM 22.7-26.5	Near Patricks Creek from 0.6 mile N of Patrick Creek Rd To 1.1 miles N of Siskiyou Fork Rd	Roadway Widening (includes replacement of small bridge)	(*currently on hold in litigation*)
199; PM 33.4	Near Idlewild at Collier Tunnel Roadside Rest Area	Collier Rest Area Rehab	Start: June 2018 Est. Completion Date: December 2020

Table 2-25. Projects Received by Caltrans through the Local Development Inter-Governmental Review Process

Route	Nearest Post Mile	Project	Received
101	35.8	Alexandre Dairy Facility. Coastal development permit for an approximate 125,000-square-feet dairy facility on Mosesley Road in Fort Dick.	Planning Phase
197	6.8	GD Morrison Creek Minor Subdivision. 259-acre parcel to be subdivided into a 46-acre residential lot and a 213-acre remainder.	12-07-18
101	37.8	Alexandre Dairy Morrison Creek Grading Permit. Remove aggraded stream channel sediment from Morrison Creek across the Fred Haight Drive crossing.	12-21-17
101	33.4	Crescent City Water Improvement Project. Water pipeline improvements that include a 120' Jack and Bore across US 101 to connect to existing water tank.	6-04-18
101	39.8	Dominie Creek Fish Passage: Bridge rehabilitation and fish passage mitigation on US 101 near Smith River	Construction Summer 2020

There are numerous active THPs in the Smith River watershed, including the THPs nearest to the Dr. Fine Bridge summarized below in Table 2-26. Further information on plans can be viewed on the CAL FIRE watershed mapper webpage (http://egis.fire.ca.gov/watershed_mapper/).

Table 2-26. Timber Harvest Plans near the Dr. Fine Bridge

Timber Harvest Plan	Received Date	Filed Date	Total Acres	CAL-Watershed ID[1]	Location	Land Owner(s)
1-16-092-DEL	09/01/2016	Not available	54	Little Mill Creek (1103.110001)	HUM: T17N R1W Sec.1	John & Carolyn Westbrook Trust
1-18-158-DEL	11/19/2018	11/29/2018	385	Little Mill Creek (1103.110001)	HUM: T17N R1E Sec.7, 8, 17, 18,19, 20, 29	California Timberlands 2 LLC, Green Diamond Resource Company
1-18-008-DEL	1/11/2018	Not Available	102	Little Mill Creek (1103.110001)	HUM: T17N R1E Sec.18, 19	California Timberlands 2 LLC, Green Diamond Resource Company
1-18-068-DEL	6/26/2018	Not Available	36	Kings Valley (1103.110003)	HUM: T17N R1W Sec. 23	O'Dell, Lorie and Michael; Wilson, Kathleen and Eric

[1] ID numbers can be viewed on the watershed mapper webpage.

2.4.3 Environmental Consequences

2.4.3.1 Build Alternatives

Under all build alternatives, the project's incremental effects on land use, utilities/emergency services, traffic/transportation, visual/aesthetics, water quality and storm water runoff, invasive species, noise and vibration, air quality, paleontology, and cultural resources are not cumulatively considerable, when considered in conjunction with other past, present, and reasonably foreseeable roadway construction, development, and logging projects in Del Norte County. Potential project effects on these resources would be localized and temporary and would be avoided and minimized through BMPs incorporated into the project. Other Caltrans projects are subject to the same BMPs and are not expected to result in substantial effects on these resources. Similarly, projects received through the IGR process, timber harvest plans, and activities on federal lands are subject to applicable environmental laws and are not expected to contribute to incremental impacts in a way that would result in substantial cumulative effects on land use, utilities/emergency services, traffic/transportation, visual/aesthetics, water quality and storm water runoff, invasive species, noise and vibration, air quality, paleontology, and cultural resources. The potential for the project to contribute to cumulative impacts on farmlands, natural communities, wetlands and other waters, and special-status species is discussed below.

Farmlands

Effects from the build alternatives to land zoned Agricultural are primarily temporary and relatively small (approximately 23 acres of temporary impacts and approximately 0.11 acre of permanent impact [Alternatives 1 and 2 only]) when compared to agricultural fields in the Smith River plain where irrigated pasture and bulb farms cover approximately 4,000 acres (NMFS 2014). The project would not contribute considerably to farmland conversion in the watershed. Other Caltrans projects, as well as residential, commercial, and industrial developments in the watershed, are not contributing to incremental impacts resulting in cumulatively considerable effects on agricultural land.

Natural Communities

All build alternatives would have temporary effects on natural communities. These effects would be reduced through avoidance and minimization measures. Other Caltrans projects are not located near the Dr. Fine Bridge. Projects received through the IGR process, such as subdivisions, are subject to regulations to protect environmental resources, including natural communities. Logging in the region could potentially contribute to cumulative effects on natural communities. Timber harvest plans are subject to California Forest Practice Rules that provide protections for natural communities. Unavoidable impacts on riparian habitat resulting from the project, although minor and occurring in less than ideal habitat, could contribute to the larger pattern of riparian habitat loss that is occurring at a broader scale. Overall, the project's incremental effect on natural communities is not cumulatively considerable.

Wetlands and Other Waters

All build alternatives would have temporary and permanent effects on wetlands. These effects would be reduced through avoidance and minimization measures; unavoidable impacts on wetlands would be offset through compensatory wetland mitigation. Other Caltrans projects are not located near the Dr. Fine Bridge. Wetland restoration projects received through the IGR process, such as wetland restoration at Pacific Shores and Bay Meadows, have the potential to affect wetlands and are intended to benefit the region's wetland communities. These projects, as well as proposed development projects, would be subject to environmental regulations that would ensure effects on wetlands are minimized and mitigated. Timber harvest plans could potentially contribute to cumulative effects on wetlands; however, they would be subject to protections for wetlands included in the California Forest Practice Rules. Although there are potentially cumulative impacts on wetlands when all projects in the region are considered collectively, avoidance, minimization, and compensatory mitigation provided for the Dr. Fine Bridge Replacement Project adequately addresses the portion of impacts attributable to the project. Therefore, the project's incremental effect on wetlands is not cumulatively considerable.

Special-status Species

Under all build alternatives some effects on special-status species are expected, including direct and indirect effects on western pearlshell mussel and fish (coho salmon). However, avoidance, minimization and mitigation measures would limit these impacts as much as possible and most impacts are expected to be temporary. Other Caltrans projects could also have effects on special-status species, potentially contributing to cumulative effects. Most other Caltrans projects reasonably foreseeable at this time are not likely to be in construction at the same time as replacement of the Dr. Fine Bridge and would also require avoidance and minimization measures to limit effects on special-status wildlife.

Projects received through the IGR process, and logging projects, have the potential to affect special-status wildlife species. These projects are subject to environmental regulations that provide protections for special-status species.

Although there are potentially cumulative impacts on special-status species when all projects in the region are considered collectively, avoidance, minimization, and compensatory mitigation provided for the Dr. Fine Bridge Replacement Project adequately addresses the portion of impacts attributable to the project. Therefore, the project's incremental effect on special-status species is not cumulatively considerable.

2.4.4 Avoidance, Minimization, and/or Mitigation Measures

No additional avoidance, minimization or mitigation measures are proposed.

No-Build Alternative

The existing conditions would remain; therefore, the No-Build Alternative would not contribute to cumulative impacts.

Chapter 3 California Environmental Quality Act Evaluation

The proposed project is a joint project by Caltrans and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the CEQA and NEPA. FHWA's responsibility for 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 USC 327) and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated, and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of "mandatory findings of significance," which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. Chapter 3 discusses the effects of this project and CEQA significance.

3.1 CEQA Environmental Checklist

This 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 projects will indicate that there are no impacts on a particular resource. A NO IMPACT answer in the last column reflects this determination. The words “significant” and “significance” used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form 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, and standardized measures that are applied to all or most Caltrans projects such as 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 below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 in order to provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This checklist incorporates by reference the information contained in Chapters 1 and 2.

I. AESTHETICS:

Except as provided in Public Resources Code Section 21099, would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?				All build alternatives
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?		All build alternatives		
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?			All build alternatives	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			All build alternatives	

a) No Impact

There are no scenic vistas in the project area.

b) Less Than Significant with Mitigation Incorporated

Under all build alternatives, the most prominent visual impact is a result of vegetation removal, tree removal, and retaining wall installation. Low growing vegetation removal along the highway would lead to temporary visual impacts but tree removal required would lead to long-term visual impacts. It would take several years for vegetation to regenerate. Until then, the removal of vegetation would create negative visual impacts. Alternatives 1 and 2 would lead to adverse visual impacts for the residences and church located northwest of the bridge. Alternative 3 would lead to adverse visual impacts for the residence located northeast of the bridge. Additionally, all alternatives may result in new views of the active quarry southeast of the bridge due to vegetation and tree removal. Visual impacts due to vegetation removal would be lessened by the standard practices described in Section 1.7.1.17 *Project Features, Standard Measures, and Best Management Practices Common to All Build Alternatives*.

The following mitigation measures would offset visual impacts of vegetation and tree removal and would reduce impacts to a less than significant level:

> **Visual-5: Screen Nearby Residences and Traveling Public.** For all build alternatives, plant trees and shrubs to screen residences from the highway and retaining walls, as well as the traveling public from the quarry.

> **Visual-6. Screen Views from Chapel.** For Alternative 1 and 2, screen the Chapel from views of the highway and retaining walls by planting native trees and shrubs.

c) Less Than Significant

Under all build alternatives, impacts to the visual character and quality of views for the traveling public would occur during and post construction. Visual impacts during construction are temporary and not significant. Any areas disturbed would be restored to a natural contour and revegetated with appropriate native plants.

Under all build alternatives, the dominance and scale of the new bridge would be in character with the existing structure and would not substantially damage the visual character or quality of the area. When compared to the existing bridge, the new bridge would have fewer piers in the river channel and would provide a less obtrusive and more visually appealing structure. Additionally, overhead utilities that are currently visible when looking west from the bridge, will be relocated and no longer visible under all build alternatives, resulting in a positive visual impact. The “see through” barrier rail and pedestrian railing would be in harmony with the existing natural environment and would reduce glare. Vegetation regrowth would eventually conceal retaining walls. Abutments and retaining walls may be stained in order to blend with the natural environment. Therefore, the project would have a less-than-significant impact on the visual character of the site.

d) Less Than Significant

The replacement bridge would be brighter due to the newness of the structure, which could produce temporary glare. Over time the replacement bridge and its materials would naturally weather, and any potential glare would decrease. No new lighting would be installed. The project does not create a new source of substantial light or glare.

See Section 2.1.5, *Visual and Aesthetics,* for more information.

II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts on 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 Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts on forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection 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.

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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?			Alternatives 1 and 2	Alternative 3
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?			All build alternatives	
c) Conflict with existing zoning for, 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))?				All build alternatives
d) Result in the loss of forest land or conversion of forest land to non-forest use?				All build alternatives
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?			All build alternatives	

a) Alternatives 1 and 2: Less Than Significant Impact Alternative 3: No Impact

Under all build alternatives, some land zoned as Agricultural General and Agriculture Exclusive will be temporarily occupied for construction access and staging; these areas will be restored to existing conditions after construction. Additionally, under Alternatives 1 and 2, approximately 0.11 acre of agricultural land will be permanently acquired to accommodate the new bridge alignment. This area consists of a small, linear, roadside strip of land near the intersection of U.S. 101 and Lake Earl Drive. The 0.11-acre area that would be converted from agricultural use under Alternatives 1 and 2 is a negligible portion (0.04 %) of a large 301.76-acre agricultural parcel. The retaining wall on the southwest side of the project area was incorporated into the design of Alternatives 1 and 2 in order to minimize the area of permanent impacts on actively farmed agricultural areas.

b) Less Than Significant Impact

Del Norte County does not participate in the Williamson Act program. The project does not conflict with existing zoning for agricultural use.

c, d) No Impact

All build alternatives will not affect active timberland and will not convert forest land to non-forest use.

e) Less Than Significant Impact

As described under question b, Alternative 1 and 2 would have a negligible impact on the conversion of agricultural land. Alternative 3 would have no impact on the conversion of agricultural land. Under all build alternatives, the project would not increase roadway capacity or modify the environment in a way that would induce growth and conversion of agricultural or timberlands.

See discussion in Section 2.1.2, *Farmlands/Timberlands,* for more information.

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

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?				All build alternatives
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?			All build alternatives	
c) Expose sensitive receptors to substantial pollutant concentrations?			All build alternatives	
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			All build alternatives	

a) No Impact

The project would not conflict with or obstruct implementation of air quality plans.

b, c, d) Less Than Significant Impact

Del Norte County is classified as in attainment for all transportation-related criteria pollutants, and as such, there are no applicable air quality attainment plans.

The project would not cause an increase in operational criteria pollutant emissions or mobile source air toxics. Under all build alternatives the proposed project may result in the generation of short-term construction-related air emissions, including fugitive dust and exhaust emissions from construction equipment. Fugitive dust, sometimes referred to as windblown dust or PM_{10}, would be the primary short-term construction impact, which may be generated during excavation, grading and hauling activities. Both fugitive dust and construction equipment exhaust emissions would be temporary and transitory in nature. Implementation of Caltrans Standard Specifications and compliance with air district rules (including preparation of a dust control plan) would reduce air quality impacts resulting from construction activities, including exposure of receptors to short-term emissions.

Objectionable odors associated with project construction by residences could be experienced during construction, but the area is not densely populated. Therefore, it would not expose a substantial number of people to objectionable odors. No specific odors have been identified, but any odors would not persist once the project is completed.

See discussion in Section 2.2.6, *Air Quality*, for more information.

IV. BIOLOGICAL RESOURCES:

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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?		All build alternatives		
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?		All build alternatives		
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?		All build alternatives		
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?		All build alternatives		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				All build alternatives
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?				All build alternatives

a) Less Than Significant Impact with Mitigation Incorporated

Caltrans prepared a Natural Environment Study to analyze impacts on habitats, wetlands and waters of the U.S. and State, plant species, and wildlife species (Caltrans 2019h). Seasonally appropriate floristic surveys have been conducted and no special-status plant species have been detected. Therefore, the project would have no impact on special-status plants.

Standard design features described in Section 1.7.1.17 *Project Features, Standard Measures, and Best Management Practices Common to All Build Alternatives* as well as avoidance and minimization measures described in Section 2.3 would lessen potential impacts to wildlife species. All build alternatives would have less-than-significant impacts on bats, ringtail, marine mammals, yellow-billed cuckoo – western DPS, little willow flycatcher, other migratory birds and raptors, special-status amphibians and reptiles, and special-status fish, including green sturgeon, Pacific lamprey, coastal cutthroat trout, and steelhead.

All build alternative could have significant impacts on SONCC coho salmon and western pearlshell mussel, but these impacts would be less than significant with the following mitigation incorporated. These measures, summarized below, are fully described in Section 2.3.3, *Animal Species,* and Section 2.3.4, *Threatened and Endangered Species.*

Coho-1. To fully mitigate for take of coho salmon that may result from this project, Caltrans would improve fish passage at a site deemed acceptable to CDFW. A possible candidate for mitigation is the remediation of the culvert that carries Dominie Creek under Highway 101 at Post Mile 39.8. Prior to any project activities that could incidentally take SONCC coho salmon, Caltrans will provide CDFW with written documentation that Caltrans has allocated sufficient funds, acceptable to and approved by CDFW, in the Expenditure Authorization for the project to ensure implementation of all measures to minimize and fully mitigate the incidental take of SONCC coho salmon.

Mussel-1. The following measures would be implemented to minimize impacts on western pearlshell mussels.

- Conduct a mussel salvage and relocation effort from the Dr. Fine Bridge Site
- Establish a mussel bed ESA.
- Normalize summer flow to the extent practicable, including softening gravel berm corners.
- Implement standard BMPs to avoid hazardous material spills or leaks, reduce the potential for sedimentation, and avoid other impacts on water quality.
- Minimize erosion impacts.

- Monitor and remove racked debris.
- Discourage recreational boat access at the mussel bed.

Once constructed, the replacement bridge is not expected to result in deterioration of coho or pearlshell mussel habitat, or other impacts on mussels and fish. However, the potentially significant impact on pearlshell mussels during construction warrants a pre-emptive salvage and relocation effort, in addition to protection of the existing mussel habitat. Since the conditions that create mussel habitat under the bridge would not be permanently altered after bridge construction is complete, the areas where mortality occurs during construction or areas where mussels have been removed for relocation prior to construction may be recolonized. Therefore, with implementation of all recommendations in Mussel-1, the pearlshell mussel population in the Smith River is expected to remain viable and the long-term impacts to pearlshell mussel are considered less than significant with mitigation.

See Section 2.3.3, *Animal Species*, and Section 2.3.4, *Threatened and Endangered Species*, for more information.

b) Less Than Significant Impact with Mitigation Incorporated

Arroyo willow thickets, Sitka willow thickets, and red alder forest are considered riparian habitat based on their connectivity to aquatic features and relative functional values for improving water quality and habitat for aquatic species. Redwood Forest, California bay forest, Red Alder forest, and Sitka willow thickets are considered CDFW Sensitive Natural Communities with a rank of S3. All of these communities, plus the Smith River, streams, and all wetland areas are considered CCC ESHAs. Under all build alternatives, standard practices described in Section 1.7.1.17 *Project Features, Standard Measures, and Best Management Practices Common to All Build Alternatives* would lessen impacts to riparian habitat and sensitive natural communities.

Due to the larger overall footprint for the new alignment, Alternatives 1 and 2 would have slightly larger additional temporary and permanent impacts when compared to Alternative 3. Alternatives 1 and 2 would have approximately 3.80 acres of temporary impacts and 0.30 acre of permanent impacts on riparian habitat. Alternative 3 would have approximately 3.32 acres of temporary impacts and 0.08 acre of permanent impacts on riparian habitats. Under all build alternatives, these impacts would be potentially significant. The following mitigation measure, summarized below and fully described in Section 2.3.1, *Natural Communities*, would reduce impacts to less than significant.

> **Riparian-1.** Compensatory mitigation would be required to offset permanent and temporary impacts on riparian habitat. Caltrans proposes restoration and replanting of

temporarily disturbed areas to enhance riparian habitat. Native vegetation will be planted. Options for on-site riparian restoration areas include restoring the unvegetated disturbed area along the Smith River's south bank. Off-site options include off-channel enhancements on tributaries of the Smith River, such as Stotenburg Creek, and coordinating with watershed steward organizations such as the Smith River Alliance. Mitigation ratios in the coastal zone are typically 4:1; exact ratios would be determined in coordination with the permitting agencies.

Impacts on all other sensitive natural communities would be less than significant. See Section 2.3.1, *Natural Communities,* for more information.

c) Less Than Significant Impact with Mitigation Incorporated

The BSA includes USACE and CCC jurisdictional wetlands (Palustrine Emergent Persistent, Palustrine Forested Evergreen, and Palustrine Scrub-shrub Broad-leaved Deciduous), plus CCC one-parameter wetlands (Broadleaf Scrub-shrub, Broadleaf Riparian Forest, and Compacted Herbaceous). All build alternatives would have temporary and permanent impacts on waters and wetlands of the U.S. and State. All build alternatives would result in a permanent net-gain of river habitat through the reduction of bridge foundations in the river. Under all build alternatives, standard practices described in Section 1.7.1.17 *Project Features, Standard Measures, and Best Management Practices Common to All Build Alternatives* would lessen impacts to riparian habitat and sensitive natural communities.

Total permanent impacts on all wetlands (USACE and Coastal) would be 0.062 acre, 0.065 acre, and 0.017 acre under Alternatives 1, 2, and 3, respectively. Total temporary impacts on all wetlands (USACE and Coastal) would be 3.040 acre, 3.038 acre, and 2.946 acres for Alternatives 1, 2, and 3, respectively. Differences in wetland impacts between alternatives are a function of the bridge alignments, size of work footprint, and location of wetland areas relative to proposed construction activities and permanent features. While the standard measures built into the project would help offset potential effects, Caltrans anticipates pursuing compensatory mitigation for impacts on wetlands and other waters. Both on-site enhancement and off-site restoration are being considered. Under all build alternatives, impacts on wetlands would be less than significant with mitigation.

Wetlands-1. While the standard measures built into the project would help offset potential effects, Caltrans anticipates pursuing compensatory mitigation for impacts on wetlands and other waters. Both on-site enhancement and off-site restoration are being considered (see Section 2.3.2). Compensatory mitigation may include a combination of on- and off-site restoration efforts. If off-site restoration were implemented, the appropriate measures would be identified and coordinated through the USACE, North Coast RWQCB, and CCC. Wetland mitigation ratios in the coastal zone are typically 4:1; exact ratios would be determined in coordination with the permitting agencies.

See Section 2.3.2, *Wetlands and Other Waters,* for more information.

d) Less Than Significant Impact with Mitigation Incorporated

Under all build alternatives, installation of the temporary gravel berm each summer would result in seasonal losses of open water and benthic habitat for resident or migratory fish. Small temporary losses of open water and benthic habitat would also occur from the placement of temporary piles for the construction trestle, detour structure (Alternative 3 only), and falsework piles. Temporary losses of riverine habitat resulting from placement of the gravel berm and temporary piles are not likely to have substantial effects on the overall quantity or quality of rearing habitat available to juvenile coho and other salmonids in the lower Smith River, or interfere substantially with the movement of any native resident or migratory fish. Impacts would be less than significant with incorporation of the following mitigation.

Coho-1. (see question a)

See Section 2.3.3, *Animal Species,* and Section 2.3.4*, Threatened and Endangered Species,* for more information.

e, f) No Impact

The project would not conflict with any local policies or ordinances protecting biological resources, and would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

V. CULTURAL RESOURCES

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

a, b, c) Less Than Significant Impact

The Historic Property Survey Report (Caltrans 2014b) and Supplemental Historic Property Survey Report (Caltrans 2019b) determined a finding of "No Historic Properties Affected." The Archaeological Survey Report (Caltrans 2014c) and Supplemental Archaeological Survey Report (Caltrans 2019b) concluded that the project is within an area of high sensitivity for buried resources but there are no known archaeological sites in the project area. A geoarchaeological study conducted by Meyer and Kaijankoski (2011) demonstrated that, although there clearly appears to have been significant tribal use in and around this location, there is little possibility of any physical remnants (archaeological sites) associated with this use to still exist. Even though no cultural resources have been identified within the project area, there could be an accidental discovery during construction. It has been agreed that tribal and archaeological monitoring of the ground disturbing construction activities occurring on land be a condition of this undertaking. "Project Features, Standard Measures, and Best Management Practices" would be incorporated into the project to ensure the project would address accidental discoveries. See the discussion in Section 2.1.6, *Cultural Resources*, for more information.

VI. ENERGY

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

a, b) No Impact

The build alternatives would not increase roadway capacity and would not increase average daily traffic volumes. The build alternatives are located in a rural, relatively undeveloped area, and this project would not induce growth or cause changes in local or regional land use. Energy use associated with proposed project construction is estimated to result in the total short-term consumption of 84,948 gallons from diesel-powered equipment and 49,593 gallons from gasoline-powered equipment (Caltrans 2019n). This demand would cease once construction is complete. Moreover, construction-related energy consumption would be temporary and not a permanent new source of energy demand, and demand for fuel would have no noticeable effect on peak or baseline demands for energy. Additionally, during construction, Caltrans standard practices and requirements for equipment efficiency would avoid wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, the project would not affect energy use.

VII. GEOLOGY AND SOILS

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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.				All build alternatives
ii) Strong seismic ground shaking?			All build alternatives	
iii) Seismic-related ground failure, including liquefaction?				All build alternatives
iv) Landslides?				All build alternatives
b) Result in substantial soil erosion or the loss of topsoil?			All build alternatives	
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?				All build alternatives
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?				All build alternatives
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?				All build alternatives

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			All build alternatives	

a i) No Impact

The project area is not located within a State of Alquist-Priolo Earthquake Fault Zone and there are no known active faults in the project area.

a ii) Less Than Significant Impact

Caltrans collected extensive subsurface geotechnical data, evaluated the potential for conditions under seismic events, and designed the bridge under all build alternatives to meet all seismic design criteria. Therefore, it is unlikely that the proposed project would expose people or structures to potential substantial adverse effects from the rupture of a known earthquake fault.

a iii, a iv) No Impact

Soil liquefaction occurs when loose, water-saturated soils lose shear strength in response to the sudden shaking from an earthquake and begin behaving like a liquid, reducing their ability to support embankments and structures. At the project site, the subsurface soils below the water table predominantly consist of well-graded sands, gravels, cobbles and rock, which are not typically prone to liquefaction. Therefore, preliminarily, the potential for liquefaction at the project site is considered minimal (Caltrans 2005, 2008c and 2014e).

b) Less Than Significant Impact

Potential project impacts related to soil erosion would be minimized through standard specifications and BMPs, including preparation and implementation of a SWPPP (per the Construction General Permit Order 2009-0009-DWQ) that includes erosion-control measures and construction waste containment measures.

c, d, e) No Impact

The project is not located on an unstable soil or geologic unit and does not have expansive soils as defined in Table 18-1-B of the Uniform Building Code (UBC) (1994). The project does not involve septic tanks or alternative waste water disposal systems.

f) Less Than Significant Impact

Based on the geologic and paleontological information available and proposed project activities, scientifically significant fossils in the formations in the project area are unlikely to be encountered, so project impacts on paleontological resources would be less than significant. Caltrans has included standard measures (see Section 1.7.17) as part of the project description to implement emergency discovery procedures if paleontological resources are encountered.

See Section 2.2.3, *Geology/Soils/Seismic/Topography*, and Section 2.2.4, *Paleontology*, for more information.

VIII. GREENHOUSE GAS EMISSIONS

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

a, b) <u>Less Than Significant Impact</u>

The proposed project would not add travel lanes or increase vehicle miles traveled. Accordingly, 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. See the discussion in Section 3.2, *Climate Change*, for more information.

IX. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			All build alternatives	
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?			All build alternatives	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				All build alternatives
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?			All build alternatives	
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?				All build alternatives
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			All build alternatives	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?				All build alternatives

a, b, d) <u>Less Than Significant Impact</u>

The Initial Site Assessments conducted for the general project area in 2001, 2004, 2008, 2015, and 2019 identified numerous potential issues that needed evaluation. These issues included contaminated properties adjacent to the project site, releases of lead from vehicle exhaust and paint, asbestos in structures and river gravels, and treated wood waste.

Both of the parcels identified with potential hazardous materials have “Case Closures” from the RWQCB, which means that they have fulfilled their obligations to mitigate for any releases that have occurred. These sites, or adjacent areas within the project, were evaluated during Preliminary Site Investigations and found that contamination issues that occurred on these parcels do not affect the proposed project.

Under all build alternatives, materials potentially contaminated with lead, asbestos, and treated wood waste would be handled, stored, transported, and disposed of according to Caltrans Standard Specifications and all applicable regulations.

c) <u>No Impact</u>

The project is not located within one-quarter mile of an existing or proposed school.

e) <u>No Impact</u>

There are no regional or private airstrips that would result in a safety hazard. The closest airport is the Del Norte County Regional Airport in Crescent City, approximately 16 miles away.

f) <u>Less Than Significant Impact</u>

The proposed project would not interfere with emergency response or increase the risk for wildfire. The project will increase the safety and reliability of the bridge by improving long-term operational conditions. During construction, traffic delays will be coordinated with all emergency responders; see Section 2.1.3, *Utilities/Emergency Services*, for more information.

g) <u>No Impact</u>

The project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.

See Section 2.2.5, *Hazardous Waste/Materials*, for more information.

X. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			All build alternatives	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such the project may impede sustainable groundwater management of the basin?				All build alternatives
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;			All build alternatives	
(ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			All build alternatives	
(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			All build alternatives	
(iv) impede or redirect flood flows?			All build alternatives	
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			All build alternatives	
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			All build alternatives	

a) Less Than Significant Impact

A Water Quality Assessment (WQA) for the Dr. Fine Bridge Replacement Project was completed in November 2015 (Caltrans 2015d) and (Caltrans 2017a). An updated WQA was completed in 2019 to evaluate multiple alternatives (Caltrans 2019d). To prevent potential impacts on water quality in the Smith River resulting from project construction activities and operations, temporary and permanent measures would be implemented in accordance with applicable storm water regulations and standards.

b) No Impact

The project would not affect ground water.

c) Less Than Significant Impact

A Final Hydraulic Report (Caltrans 2016d) was prepared for the project to determine whether the build alternatives would meet hydraulic requirements for the structure as well as impacts on the floodplain. A Scour Effects Analysis Report (Caltrans 2019m) was prepared to evaluate river hydraulics that may be affected by the project. The analysis modeled existing and proposed conditions under each build alternative, as well as interim conditions expected during construction. The Scour Effects Analysis Report indicated that during construction, the temporary work trestles, gravel berms, and detour bridge would have an impact on channel hydraulics. This is due to the temporary construction features in the river channel occupying flow area that is open with the existing bridge in place. This would cause redirection of flow (typically just a local redirection) that would slow the flow velocity and decrease flow depth in some locations near the bridge and increase flow velocity and depth at others.

Under all build alternatives, the proposed permanent bridge will have fewer piers in the channel and will therefore have a lower potential to capture floating debris and will improved flow conditions when compared to the existing bridge. Short-term temporary measures focus on implementing construction BMPs aimed at reducing erosion and subsequent sediment transport. Before any ground-disturbing activities, the contractor will prepare a SWPPP that includes erosion-control measures and construction waste containment measures. Storm water runoff within the project area discharges to the Smith River. Storm water accumulated on the existing bridge structure is currently discharged directly to the Smith River. Storm water from the surrounding land is discharged to the river by culverts, streams, and wetlands. Under all build alternatives, bioswales would be incorporated to promote retention to treat runoff prior to discharge, which reduces impacts on water quality post construction. Impacts on hydrology and water quality would be less than significant.

See Section 2.2.1, *Hydrology and Floodplain,* and Section 2.2.2, *Water Quality and Storm Water Runoff,* for more information.

d) <u>Less Than Significant Impact</u>

A portion of the project area is in an area mapped by FEMA as part of the 100-year flood. Based on the Final Hydraulic Report (Caltrans 2016d), the proposed project area is within a floodplain. The analysis indicates all build alternatives would not impede or redirect flood flows, nor expose people to an increase risk in loss from flooding, tsunami, seiche, or mudflow.

e) <u>Less Than Significant Impact</u>

The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

XI. LAND USE AND PLANNING

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Physically divide an established community?				All build alternatives
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?				All build alternatives

a, b) <u>No Impact</u>

The project is consistent with state, regional and local plans, including the Del Norte County 2011 Regional Transportation Plan, the Del Norte County 2003 General Plan, and the Del Norte County 1983 Local Coastal Plan. The project occurs in the coastal zone and a coastal development permit will be required. There would be no impacts on land use. See the discussion in Section 2.1.1, *Land Use* for more information.

XII. MINERAL RESOURCES

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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?				All build alternatives
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?				All build alternatives

a, b) <u>No Impact</u>

The project does not include extraction of mineral resources or located on a site delineated for mineral resources. There would be no impact.

XIII. NOISE

Would the project result in:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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?			All build alternatives	
b) Generation of excessive groundborne vibration or groundborne noise levels?			All build alternatives	
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?				All build alternatives

a, b) <u>Less Than Significant Impact</u>

The project would not increase highway capacity, thus post-construction noise levels would not change significantly from existing conditions. During construction, residences near the project construction would hear general construction noise. Pile driving would likely be the largest noise source generated; however, pile driving would not occur for the entire duration of construction. Construction noise near residences would be limited so that it does not exceed 86 dBA LMax at 50 feet from the job site activities from 9 p.m. to 6 a.m. Noise impacts on Sunday church services at the nearby Calvary Chapel would be avoided. Under Alternative 1 and 2, the new bridge would be located approximately 50 feet to the west of the existing alignment, bringing the road closer to some nearby sensitive receptors. However, this realignment would not result in significant operational noise impacts.

See the discussion in Section 2.2.7, *Noise and Vibration*, for more information.

c) <u>No Impact</u>

There are no regional or private airstrips that would expose people or working to excessive noise levels. The closest airport is in Crescent City, the Del Norte County Regional Airport, is approximately 16 miles away.

XIV. POPULATION AND HOUSING

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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)?				All build alternatives
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				All build alternatives

a, b) <u>No Impact</u>

Under all build alternatives, the project would not induce population growth or cause displacement. There would be no impact.

XV. PUBLIC SERVICES

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:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
(i) Fire protection?			All build alternatives	
(ii) Police protection?			All build alternatives	
(iii) Schools?				All build alternatives
(iv) Parks?				All build alternatives
(v) Other public facilities?				All build alternatives

a i, ii) <u>Less Than Significant Impact</u>

Under Alternatives 1, 2, and 3B, no detour is planned. Under Alternative 3A, temporary closure of U.S. 101 is proposed for up to one week to move the existing bridge onto a temporary detour. During the temporary closure, emergency services will need to use State Route 197 and U.S. 199. The detour is approximately 11 miles. During this time, one way controlled traffic would be needed along the detour in order to allow for trucks to pass through. Emergency vehicles are exempt from road lane closures, and every effort would be made to allow police and fire vehicles to pass through construction zones without delay. Proper notification and advanced warning to nearby emergency service providers, currently included in the draft Transportation Management Plan, would ensure adequate egress and ingress for emergency service personnel. See Section 2.1.3, *Utilities/Emergency Services*, for further discussion.

aiii, iv, v) No Impact

The project would have no impact on parks, schools, or other public facilities.

XVI. RECREATION

	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?			All build alternatives	
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?			All build alternatives	

a, b) Less Than Significant Impact

There is currently informal boat access on the south side of the river under the bridge. Under all build alternatives, during construction this access will be temporarily unavailable. Upon project completion, pedestrian access will remain, but there will no longer be vehicular access to the Smith River at the Dr. Fine Bridge. This change is not expected to substantially increase the use of other nearby access points such that physical deterioration of the facility would occur or be accelerated.

Under all build alternatives, impacts on recreation would be less than significant. See the discussion of project recreational impacts in Section 2.1.1.5, *Parks and Recreation Facilities*, for further discussion.

XVII. TRANSPORTATION

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?				All build alternatives
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?			All build alternatives	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				All build alternatives
d) Result in inadequate emergency access?			All build alternatives	

a, c) No Impact

The project is consistent with the Del Norte County 2011 Regional Transportation Plan. The project would not increase hazards due to design features or incompatible uses.

b, d) Less Than Significant Impact

Under all build alternatives, although there may be temporary traffic delays during construction, there would not be any permanent changes to transportation or traffic. Emergency service agencies would be notified of lane closures and emergency vehicles are exempt from road lane closures. Effort would be made to allow police and fire vehicles to pass through construction zones without delay. Bicycles would be accommodated through the construction area at all times. The project increases pedestrian and bicycle access and would not have the potential to increase Vehicle Miles Traveled; therefore, it is consistent with CEQA guidelines section 15064.3, subdivision (b). See the discussion in Section 2.1.3, *Utilities/Emergency Services*, and Section 2.1.4, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, for more information.

XVIII. TRIBAL CULTURAL RESOURCES

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:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
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			All build alternatives	
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.			All build alternatives	

a, b) <u>Less Than Significant Impact</u>

Native American consultation for this project was initiated for this project in 2007 and has continued through the life of the project. The primary tribe that has been consulted with has been the Tolowa Dee-ni' Nation (formerly known as the Smith River Rancheria) with the Elk Valley Rancheria also providing occasional input as well. Recent correspondence regarding the project began in the spring of 2018 and is ongoing. Consultation has involved communications by emails, phone and letter, as well as meetings with the Tolowa Dee-ni' Nation Tribal Historic Preservation Officer and Tribal Council. Outreach to Native American representatives indicates that although there are no previously identified Tribal Cultural Resources, the project area is highly sensitive for potential discovery of Tribal Cultural Resources. Through tribal outreach, Caltrans and Native American representatives agreed that a tribal monitor should be present during ground-disturbing construction activities over the life of the project. “Project Features, Standard Measures, and Best Management Practices” will be incorporated into the project to ensure the project would address accidental discoveries. Impacts would be less than significant. See Section 2.1.6, *Cultural Resources*, for more information.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			All build alternatives	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?				All build alternatives
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?				All build alternatives
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?			All build alternatives	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			All build alternatives	

a) Less Than Significant Impact

Under all build alternatives, the project includes water quality features to treat both sheet flow from paved areas as well as concentrated flow volumes collected from roadside ditches and paved areas. The project would include the use of permanent stormwater treatment BMPs such as biostrips and bioswales, to provide water quality benefits including the settlement of soil particles, pollutant removal, and increase stormwater retention times to promote infiltration. See Section 2.1.3, *Utilities/Emergency Services* and Section 2.2.2, *Water Quality and Stormwater Runoff*, for more information.

b, c) No Impact

Under all build alternatives the project would not generate wastewater or require the development of new wastewater facilities. The project would not require new or increase water supplies.

d, e) Less Than Significant Impact

All solid waste generated during construction of the proposed project would be collected by the contractor and disposed of in accordance with applicable local, state and federal regulations.

XX. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	**Potentially Significant Impact**	**Less Than Significant with Mitigation**	**Less Than Significant Impact**	**No Impact**
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			All build alternatives	
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?				All build alternatives
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 on the environment?				All build alternatives
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?			All build alternatives	

a, d) Less Than Significant Impact

The project is in a State Responsibility Area in a moderate fire hazard severity zone, as mapped by CalFire's Fire and Resource Assessment Program (https://egis.fire.ca.gov/FHSZ/). Under all build alternatives, although there may be temporary traffic delays during construction, the project would not substantially impair an adopted emergency response plan or emergency evacuation plan. Caltrans' Standard Measures provide for coordinating with emergency response agencies and ensuring emergency access throughout the construction period. The project would not expose people or structures to significant risks as a result of runoff, post-fire instability, or drainage changes. See Section 2.1.3, *Utilities/Emergency Services*, and Section 2.2.2, *Water Quality and Stormwater Runoff*, for more information.

b, c) No Impact

The project would not directly or indirectly exacerbate wildfire risks and would not require the installation or maintenance of infrastructure that may exacerbate fire risk.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

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

a) <u>Less Than Significant Impact with Mitigation Incorporated</u>

As discussed within Chapter 2 and within the CEQA Checklist, the project as mitigated would not have the potential to 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, or reduce the number or restrict the range of a rare or endangered plant or eliminate important examples of a major periods of California history or prehistory. All build alternatives would have potentially significant impacts to riparian habitat, wetland habitat, coho salmon, and western pearlshell mussel. However, implementation of mitigation measures would reduce impacts to less than significant.

b) <u>Less Than Significant Impact</u>

When all projects in the region are considered collectively, the Dr. Fine Bridge Replacement Project includes avoidance, minimization, and compensatory mitigation that adequately addresses the portion of impacts attributable to the project. The project would not have impacts that are individually limited, but cumulatively considerable, and would not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly. Therefore, the project's incremental effect is not cumulatively considerable. See Section 2.4, *Cumulative Impacts*, for more information.

c) No Impact

The project would not have environmental effects that would cause substantial adverse effects on human beings, either directly or indirectly.

3.2 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 (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), and various hydrofluorocarbons (HFCs). CO_2 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 CO_2.

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.

3.2.1 Regulatory Setting

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

3.2.1.1 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 (42 USC 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The 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 n.d.). 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 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. EPA[1] 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. The U.S. EPA and NHTSA are currently

[1] 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 EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions (U.S. EPA 2019).

considering appropriate mileage and GHG emissions standards for 2022–2025 light-duty vehicles for future rulemaking.

The 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 CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

3.2.1.2 State

California has been innovative and proactive in addressing GHG emissions and climate change by passing multiple Senate and Assembly bills and executive orders 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 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 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 in emissions of GHGs beyond 2020 (Health and Safety Code 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 ($MMTCO_2e$).[2] 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.

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.”

[2] GHGs differ in how much heat each trap in the atmosphere (global warming potential, or GWP). CO_2 is the most important GHG, so amounts of other gases are expressed relative to CO_2, using a metric called “carbon dioxide equivalent” (CO_2e). The global warming potential of CO_2 is assigned a value of 1, and the GWP of other gases is assessed as multiples of CO_2.

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.

Senate Bill 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 travelled, 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.

Senate Bill 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.

Executive Order 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.

3.2.2 Environmental Setting

The proposed project is in a rural area, with a primarily natural resources based agricultural and tourism economy. U.S. 101 is the main transportation route to and through the area for both passenger and commercial vehicles. The nearest alternate route is SR-197, which intersects with U.S. 101 north of the bridge. Traffic counts are low (7,210 AADT) and U.S. 101 in the project area is rarely congested. There are no railroad tracks within the immediate vicinity of the project. The Del Norte Local Transportation Commission is the Regional Transportation Planning Agency for Del Norte County and guides transportation development.

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. The U.S. EPA is responsible for documenting GHG emissions nationwide, and the ARB does so for the state, as required by Health and Safety Code Section 39607.4.

3.2.2.1 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. The inventory provides a comprehensive accounting of all human-produced sources of GHGs in the United States, reporting emissions of CO_2, CH_4, N_2O, HFCs, perfluorocarbons, SF_6, and nitrogen trifluoride. It also accounts for emissions of CO_2 that are removed from the atmosphere by "sinks" such as forests, vegetation, and soils that uptake and store CO_2 (carbon sequestration). The 1990–2016 inventory found that of 6,511 $MMTCO_2e$ GHG emissions in 2016, 81 percent consist of CO_2, 10 percent are CH_4, and 6 percent are N_2O; the balance consists of fluorinated gases (EPA 2018). In 2016, GHG emissions from the transportation sector accounted for nearly 28.5 percent of U.S. GHG emissions.

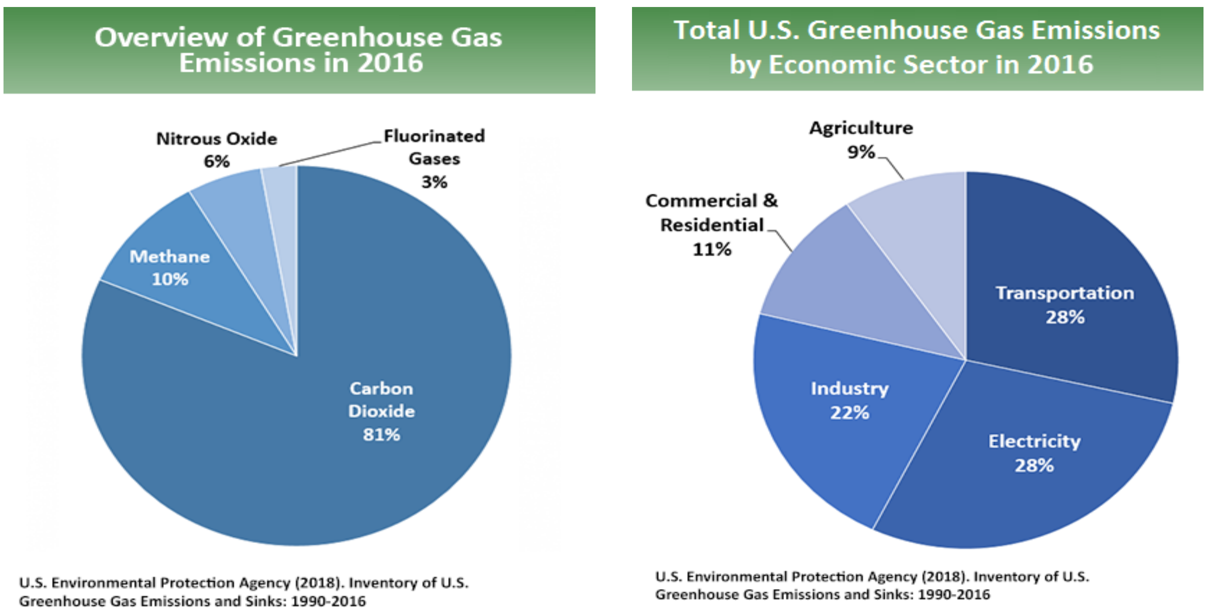


Figure 3-1. National 2016 Greenhouse Gas Emissions

3.2.2.2 State GHG Inventory

ARB collects GHG emissions data for transportation, electricity, commercial/residential, industrial, agricultural, and waste management sectors each year. 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 $MMTCO_2e$ 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 (CARB 2019a).

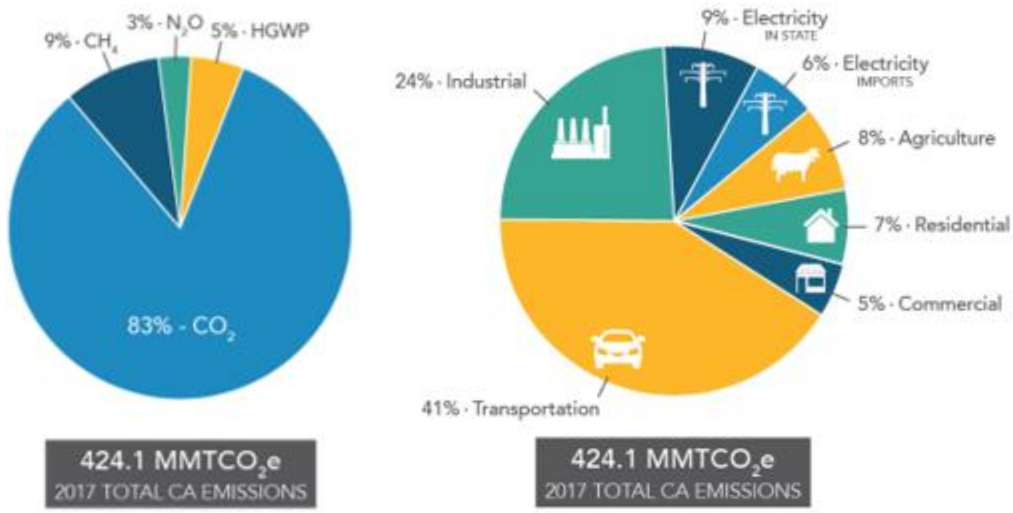


Figure 3-2. California 2017 Greenhouse Gas Emissions

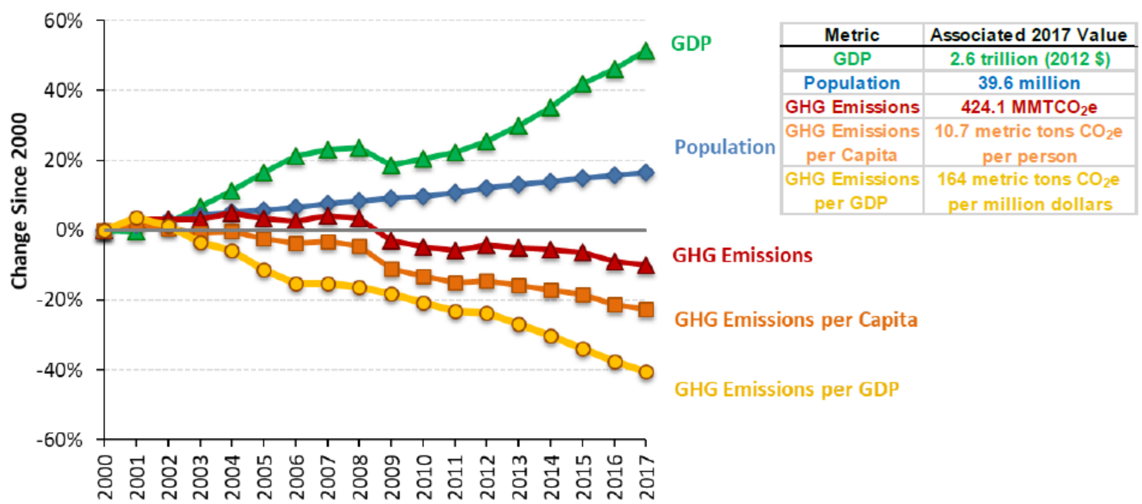


Figure 3-3. Change in California GDP, Population, and GGH Emissions since 2000

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.

3.2.2.3 Regional Plans

As discussed above, the proposed project is within the jurisdiction of the Del Norte Local Transportation Commission. Table 3-1 lists the relevant GHG objectives and policies from the draft 2016 RTP. Del Norte County does not have a climate action plan, and their current General Plan does not contain GHG-related goals or policies.

Table 3-1. Regional Greenhouse Gas Policies

Title	GHG Reduction Policies or Strategies
2016 Regional Transportation Plan, Del Norte Local Transportation Commission (2016)	Objective: Reduce or maintain GHG emissions from transportation related sources in Del Norte County 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, ITS strategies and maintenance of existing roadways to reduce vehicle emissions.

3.2.3 Project Analysis

GHG emissions from transportation projects can be divided into those produced during operation of the SHS and those produced during construction. The primary GHGs produced by the transportation sector are CO_2, CH_4, N_2O, and HFCs. CO_2 emissions are a product of the combustion of petroleum-based products, like gasoline, in internal combustion engines. Relatively small amounts of CH_4 and N_2O 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 (PRC 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.

3.2.3.1 Operational Emissions

The purpose of the proposed project is to improve the safety, connectivity, and reliability of Dr. Fine Bridge for hikers, bikers, travelers, commuters, and freight carriers. It will not increase the vehicle capacity of the bridge or U.S. 101 in the project area. 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.

3.2.3.2 Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. Emissions would be produced at different levels throughout the construction phase for the build alternatives; 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 Air Quality and Noise Analysis for the Dr. Fine Bridge Replacement Project (Caltrans 2019f) evaluated short-term effects of construction on GHG emissions. Construction is expected to last approximately 783 working days for the build alternatives. The CAL-CET2018 (1.1) was used to estimate average CO_2, CH_4, and N_2O emissions from construction activities. Tables 3-2 and 3-3 estimate average GHG emissions generated by on-site equipment by alternative for the project and does not include emissions from detour miles (for alternative 3B) and idling delays.

Table 3-2. Estimates of GHG Emissions of Alternative 1 and 2(US tons)

Construction Year	CO_2	CH_4	N_2O	HFCs	CO_2e*	CO_2e*1
2021	149	0.005	0.008	0.004	211	191
2022	485	0.015	0.025	0.017	744	676
2023	330	0.010	0.016	0.015	557	505
2024	265	0.007	0.018	0.018	537	487
Total	1,229	0.037	0.067	0.054	2,049	1,859

* A quantity of GHG is expressed as carbon dioxide equivalent (CO_2e) that can be estimated by the sum after multiplying each amount of CO_2, CH_4, N_2O, and HFCs by its global warming potential (GWP). Each GWP of CO_2, CH_4, N_2O, and HFCs is 1, 25, 298, and 14,800, respectively.
[1] metric ton

Table 3-3. Estimates of GHG Emissions of Alternative 3 (3A and 3B) (US tons)

Construction Year	CO2	CH4	N2O	HFCs	CO2e*	CO2e*1
2021	142	0.005	0.008	0.004	204	185
2022	463	0.014	0.024	0.016	707	642
2023	315	0.010	0.015	0.015	542	492
2024	254	0.007	0.018	0.017	511	464
Total	1,174	0.036	0.065	0.052	1,964	1,782

* A quantity of GHG is expressed as carbon dioxide equivalent (CO_2e) that can be estimated by the sum after multiplying each amount of CO_2, CH_4, N_2O, and HFCs by its global warming potential (GWP). Each GWP of CO_2, CH_4, N_2O, and HFCs is 1, 25, 298, and 14,800, respectively.
[1] metric ton

All construction contracts include Caltrans Standard Specifications Section 7-1.02A and 7-1.02C, Emissions Reduction, which require contractors to comply with all laws applicable to the project and to certify they are aware of and will comply with all ARB emission reduction regulations; and Section 14-9.02, Air Pollution Control, which requires contractors to comply 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.

3.2.3.3 CEQA Conclusion

While the proposed project would result in GHG emissions during construction, it is anticipated that 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 for the build alternatives.

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

3.2.3.4 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 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.

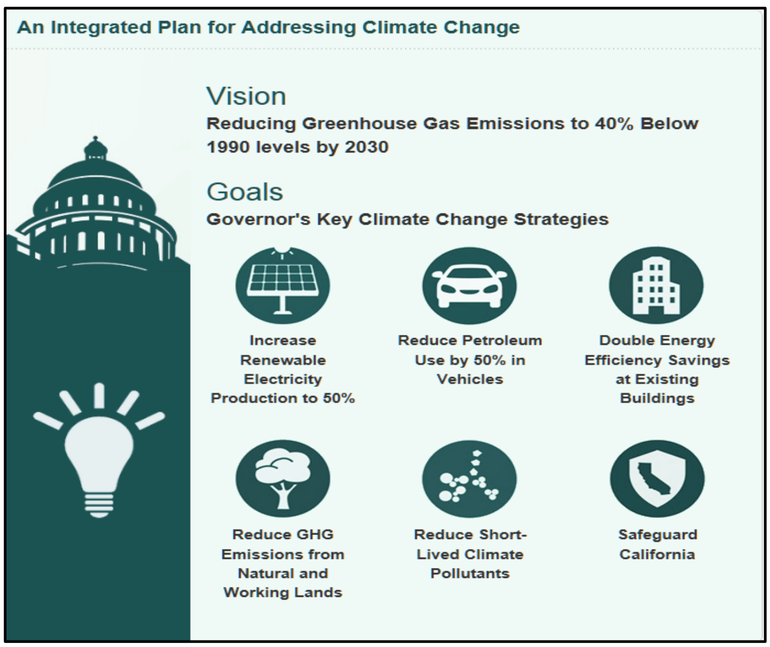


Figure 3-4. California Cimate Strategy

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 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)

In addition, SB 1386 (Wolk 2016) 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 (CTP 2040)

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 CO_2 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 GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG 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 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 GHG Reduction Strategies

The following measures will also be implemented in the project to reduce GHG emissions and potential climate change impacts from the project.

1. According to Caltrans' Standard Specifications, the contractor must comply with all of the local Air Pollution Control District's (APCD) rules, ordinances, and regulations regarding to air quality restrictions.

2. Caltrans Standard Specifications, a required part of all construction contracts, should effectively reduce and control emission impacts during construction under the provisions of Section 7-1.02C "Emission Reduction". Provision 14-9.02 "Air Pollution Control" requires the contractor to comply with all pertinent rules, regulations, ordinances, and statutes of the local air district.

3. The area under the existing northern abutment, approximately 0.12 acres, that is currently covered in rock slope protection (RSP) and sakrete will have the RSP and sakrete removed and will be vegetated post project completion. Landscaping reduces surface warming and, through photosynthesis, decreases CO_2.

4. TT-3- Transportation Management Plan would include meaures to maintain bicycle and pedestrian access during construction.

5. AQ-6- Construction Equipment, includes scheduling and routing construction traffic to reduce congestion and emissions from idling vehicles along local roads during peak travel times, when feasible.

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 that 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 delivers a report to Congress and the president every 4 years, in accordance with the Global Change Research Act of 1990 (15 USC Chapter 56A Section 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) 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.
- 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 factor(s). These factors include, but are not limited to: ethnicity, class, sexual orientation and identification, national origin, and income inequality.2 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* 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 (Quirk 2016) 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

Caltrans 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

Because the project is in the coastal zone, an SLR analysis is provided below. The new bridge's time horizon, adaptive capacity, risk tolerance, and location/elevation in relation to current and projected tidal influence in the Smith River were considered in evaluating potential SLR impacts.

Under all build alternatives, the project design life for the new bridge extend beyond 2070. This increases the likelihood that SLR will occur during the lifetime of the new bridge. Adaptive capacity is the ability of a system to respond to climate change, to moderate potential damages, to take advantage of opportunities, and to cope with the consequences. The bridge has a low adaptive capacity as its location is fixed. If flooding at the bridge were to occur, the risk of impacts would be relatively high as they would cause motorists to be rerouted to SR 197 and U.S. 199, which may also be at risk of flooding. Potential risks related to SLR are compounded by storm events, including the confluence of large waves, storm surges, and high astronomical tides during a strong El Niño.

Table 3-4 below shows the probable range of sea-level rise projections from the *State of California Sea-Level Rise Guidance 2018 Update* (California Ocean Protection Council 2018). The Crescent City tide gage is the closest to the project area, approximately 15 miles south of the mouth of the Smith River. At Crescent City, the tide gage record extends back to 1933 and shows, over the period of record, a local drop in sea level of -0.65 +/-0.36 mm/yr., equivalent to -0.21 feet/100 years. The drop in sea level is explained by a rising coastline near Crescent City due to flexure of the North American tectonic plate above the subducting Juan de Fuca plate (CO-CAT 2013).

Table 3-4. Sea-Level Rise Projections using 2000 as the Baseline

Year	**High Emissions Scenario (RCP 8.5)** 66% probability SLR is between (feet)	**H++ Scenario (feet) (no probability)**	**The maximum height reached by rising Sea Tide (feet) NAVD88 (H+++ Scenario)**	**Possible tidal effect water depth at the bridge streambed 13.85 (feet) NAVD88 based on (H+++ Scenario)**
2019	0	0	10.66	N/A
2040	0.1–0.4	1.4	12.06	N/A
2070	0.4–1.2	4.5	15.16	1.31
2100	0.7–2.5	9.3	19.96	6.11

Source: Ocean Protection Council 2018
RCP = Representative Concentration Pathway. RCPs are emissions scenarios used by the Intergovernmental Panel on Climate Change that represent different levels of future expected GHG concentrations based on a family of possible underlying socioeconomic conditions, policy options, and technological considerations. RCP 8.5 is often considered the “business-as-usual” scenario. H++ is the most extreme scenario considered in the 2018 Guidance Update (Ocean Protection Council 2018:13).

Based on the projections provided in Table 3-4, up to 0.4 feet of SLR could be expected by 2040 and 2.5 feet by 2100. The probability that SLR will reach or exceed 1 foot in 2040 is 0.3%; in 2070 is 31%; and in 2100 is 72%. The probability of SLR reaching or exceeding 2 feet in 2070 is 2%, and in 2100 is 30%.

According to historical high tide data for Station 9419750 in Crescent City, the highest recorded tide elevation at this station is 10.66 feet NAVD88, which occurred in January 1983 (NOAA 2019). Table 3-4 illustrates the effects of sea level rise based on the *Ocean*

Protection Council 2018 Sea Level Rise document. Higher values could occur with one or more combinations of strong storms, high tide events, wind waves, and high flow events on rivers.

The project is located at the eastern boundary of the coastal zone, approximately 7.6 river miles from the Pacific Ocean and 3.8 miles as a straight-line distance from the Pacific Ocean. The lowest point of the bottom of the Smith River channel below the bridge is at an elevation of approximately 12 feet amsl. Figure 3-5 below, generated from NOAA's SLR viewer (NOAA 2019), shows the water depth of the Smith River under the current Mean Higher High Water level and with SLR of 5 feet. According to this SLR visualization tool, there is no detectable increase in water depth in the Smith River at the location of the U.S. 101 bridge with 5 feet of SLR.

The existing bridge deck is at an elevation of approximately 64 feet amsl, with the lowest portion of the soffits at approximately 52 feet amsl. Under all three build alternatives, the bridge deck would be at or above the existing deck elevation, and soffit elevation would vary depending on bridge type (CIP or PC). The OHWM is estimated to be at an elevation of approximately 22 feet, providing ample freeboard. During 100-year floods, the top of bank elevation is 33 feet amsl; this is the surface water elevation at which the river overtops its banks and enters the floodplain. During a 100-year flood, the bridge would have adequate freeboard to pass 100-year flows. Even under the worst case SLR scenario, during a high tide event corresponding with a 100-year flood, the bridge would not be expected to flood. During this situation however, the floodplain of the Smith River, located south of the bridge could be flooded, potentially rendering the road impassable.

Because the bridge is located at the eastern boundary of the coastal zone, and due to the adequate freeboard between the bridge and expected maximum water levels by the year 2100, the bridge is expected to be resilient to predicted future SLR. No additional measures to further adapt to SLR are needed for the project.

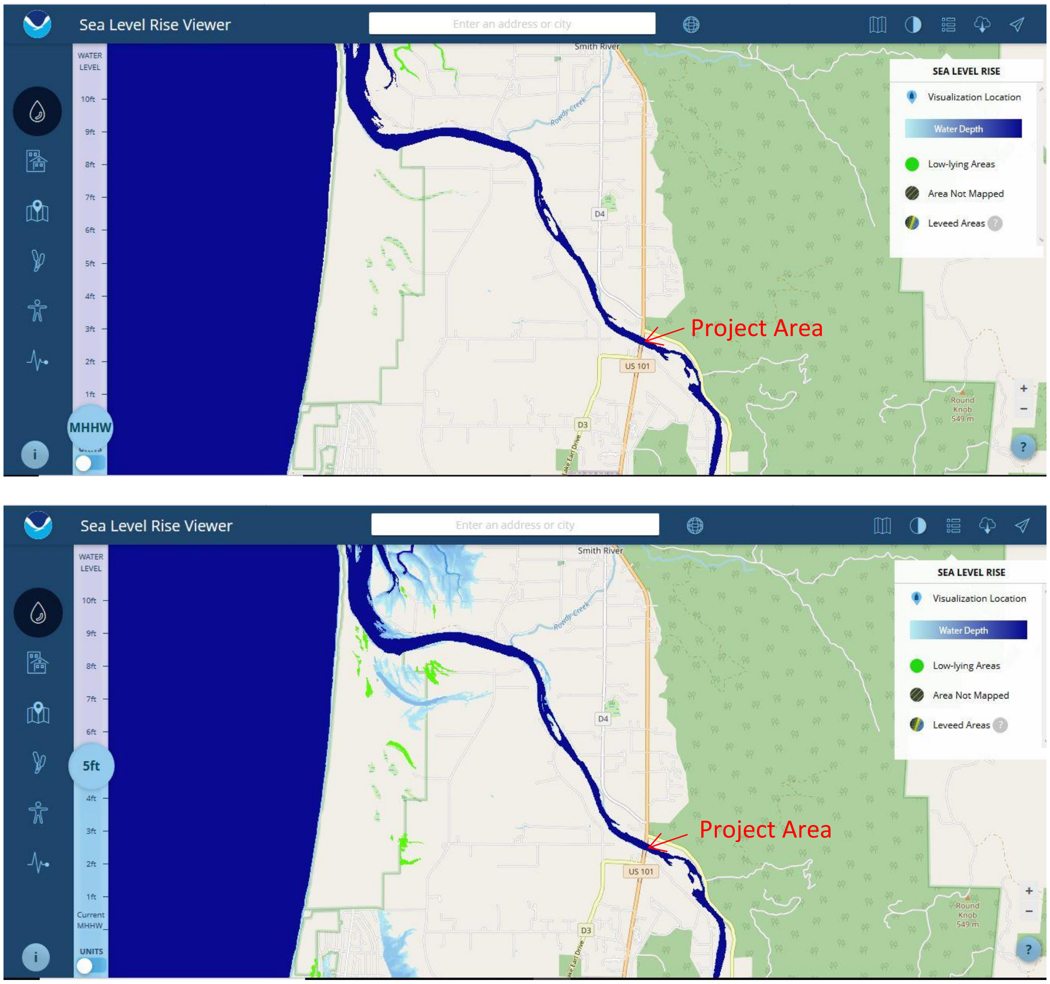


Figure 3-5. Water Depth in the Smith River under Current Conditions (top) and with 5 feet of SLR (bottom), based on NOAA's SLR Visualization Tool

Floodplains

The Smith River is the largest free-flowing river in California, with no human-made obstructions for its entire course. The project area is in a FEMA Special Flood Hazard Area, subject to the 1% annual chance (100-year) flood, Zone AE (base flood elevation determined). According to the project's Final Hydraulic Report (Caltrans 2016), average annual precipitation in the project study area is approximately 103 inches. The river basin's shape gives it a sharp reaction to rainfall and runoff. Intense flows develop rapidly and reach a peak approximately 6 to 8 hours after the most intense part of the storm. The project's Water Quality Assessment Report (revised November 2015) reports the river's average monthly flow ranges from a low of 336 cubic feet per second (cfs) in September to a high of 8,432 cfs in January. The largest flood on record, in 1964, discharged 228,000 cfs at its peak, and remained above 100,000 cfs for 30 hours. However, there is no history of the existing bridge ever overtopping (Caltrans 2016).

The Hydraulic Report analysis determined that the existing bridge and the proposed replacement bridge design provide adequate freeboard (distance from the water surface to bottom of the bridge soffit) to withstand both a 50-year design flood of 216,900 cfs and a 100-year base flood event of 250,000 cfs. The minimum soffit elevation of 58.2 feet for the proposed replacement structure would provide more than 18 feet of freeboard for a 50-year flood, and more than 16 feet for a 100-year flood. Exact projections of changes in regional precipitation are not readily available. However, the Caltrans District 1 Climate Change Pilot Study (2014) estimates an increase of from 5% to more than 10% (2.0 to more than 2.5 inches) in daily precipitation in the project area between 2035 and 2099 under a wet global climate model, compared to the 1970–1999 historic period (Caltrans and Humboldt County Association of Governments 2014). Given the substantial freeboard available under the replacement bridge design, and the presence of an overflow, or "relief," bridge (BR. No. 01-0046) 1,200 feet south of the Dr. Fine bridge, it is anticipated that the new bridge would be resilient to future potential higher flood flows without any additional adaptive measures. The low point of the overflow bridge is higher in elevation than the year 2100 H++ scenario and would not see any flow due to the tides.

Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential effects, mitigation measures, and other related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including meetings, emails, postal mail, and through telephone correspondence.

4.1 Public Participation

An NOP was circulated to the public on October 18, 2010 and a public meeting was held on November 3, 2010. The meeting was at the Smith River Community Hall 241 West 1st Street, Smith River.

Comment letters from the following agencies were received in response to the NOP:

- CCC
- Native American Heritage Commission
- California Department of Water Resources - North Coast RWQCB
- California State Lands Commission
- CDFW

Ten comments were received from the public.

In June 2017, a draft IS/MND evaluating the Jack and Slide East (currently Alternative 3A) and No-Build Alternative was circulated for review.

Four comments were received from the public in response to the IS/MND, including a letter from the Friends of Del Norte and a letter from the Smith River Alliance.

Comment letters from the following agencies were received in response to the 2017 IS/MND:

- CCC
- North Coast RWQCB
- California State Lands Commission

- CDFW
- NMFS
- USACE

4.2 Agency Coordination

The following agencies, organizations, and businesses have been contacted regarding this project: the USFWS, NMFS, USACE, USFS, CCC, RWQCB, CDFW, NPS, U.S. Coast Guard, State Lands Commission, Tolowa Dee-Ni' Nation (previously Smith River Rancheria), the Elk Valley Rancheria, the Friends of Del Norte, and the Environmental Protection Information Center. This communication is summarized below.

In addition, the following coordination has been conducted:

2019

- May 2019: Field meeting with CDFW and CCC to discuss potential mitigation for wetland impacts and public access.
- March 2019: Meeting with CDFW and CCC to discuss build alternatives, project schedule, public access, and agricultural lands.
- March 2019: Email sent to State Lands Commission concerning shipwrecks records for the project ·site. No response was received.

2017

- June 2017: Field review with CDFW regarding foothill yellow-legged frog.
- May-June 2017: Correspondence with CDFW and USFWS regarding yellow-billed cuckoo effects.
- April 2017: Meeting with NMFS regarding ESA Section 7 consultation.
- February 2017: Meeting with CDFW, NMFS, USACE, RWQCB, and CCC to discuss project design.
- February 2017: field visit with USACE to review Preliminary Jurisdictional Determination.
- January 2017: Meeting with CDFW, NMFS, USACE, RWQCB, and CCC to discuss project design.

2016

- November 2016: Meeting with CCC to discuss proposed project.
- July 2016: Meeting with CDFW regarding use of Dominie Creek as coho salmon mitigation.
- May 2016: Meeting with CDFW regarding potential mitigation for coho salmon.
- April 2016: Field review with CDFW
- April 2016: Meeting with multiple representatives from CDFW, NMFS and CCC regarding project description, design, impacts and analysis.
- February 2016: Caltrans received written questions from CDFW and NMFS regarding project description and impacts.
- February 2016: Discussed project and potential conservation measures with CDFW, NMFS Fisheries at project consultation meeting.
- February 2016: Caltrans contacted the U.S. Coast Guard to determine jurisdiction; project is outside of Coast Guard jurisdiction.
- January 2016: Meeting with NMFS and CDFW regarding proposed project and status.

2015

- December 2015: Discussed potential mitigation and avoidance/minimization measures with CDFW and NMFS.
- October 2015: Field review meeting with CDFW and NMFS.
- September 2015: Discussed potential mitigation with CDFW, NMFS, and CCC at project consultation meeting.
- August 2015: Met with CDFW and NMFS to review potential fish mitigation.
- July 2015: Provided the CCC a project update at the bi-annual Caltrans-CCC coordination meeting.

2014

- July 2014: Provided the CCC a project update at the bi-annual Caltrans-CCC meeting.
- September 2014: Discussion with CDFW and NMFS to discuss impacts on salmonids during pile driving.
- September 2014: Met with CCC onsite during regularly scheduled meeting dates to discuss the proposed project.

- August 2014: Met with Environmental Protection Information Center
- August 2014: Met with CCC staff onsite to discuss the proposed project.
- January 2014: Met with the CDFW to discuss geotechnical drilling needs and to discuss the overall project, LSAA (1600 permit) obtained for drilling.

2013

- December 2013: Provided the CCC a project update at the bi-annual Caltrans-CCC meeting.
- December 2013: Provided the Smith River Rancheria and Elk Valley Rancheria Tribal Heritage Preservation Officers a project update.
- October 2013: Met at the project site with the RWQCB to discuss the project.
- October 2013: The Smith River Rancheria and Elk Valley Rancheria were emailed a project update.
- October 2013: NMFS Fisheries was contacted to discuss the project's potential to affect sensitive fish species.
- October 2013: The USFWS was contacted to discuss the project's potential to affect the northern spotted owl, marbled murrelet, yellow-billed cuckoo, and sensitive plant species.
- October 2013: The CDFW was contacted to discuss the project's potential to affect sensitive fish species.
- April 2013: The NMFS was contacted to discuss the project's potential to affect sensitive fish species.
- March 2013: The CDFW was contacted to discuss the Wild and Scenic Rivers Act.
- March 2013: The NPS was contacted to discuss the Wild and Scenic Rivers Act.
- January 2013: Met with the CCC to discuss project alternatives and the need for a center lane on the bridge.

2011

- October 2011: Met with the CCC to discuss the project.
- October 2011: Met with the CCC to discuss Coastal Act procedural issues and schedule.
- August 2011: The USACE was contacted to discuss the project.
- June 2011: Provided the Smith River Rancheria and Elk Valley Rancheria Tribal Heritage Preservation Officers some conceptual views of the proposed bridge.

- March 2011: The California Department of Water Resources was contacted to discuss the project's potential to impact water quality.
- March 2011: Notified the Smith River Rancheria Tribal Heritage Preservation Officer of the upcoming geotechnical drilling.

2010

- December 2010: Asked the Smith River Rancheria and Elk Valley Rancheria Tribal Heritage Preservation Officers for possible Tolowa Indian designs.
- November 2010: Public Scoping Meeting was held at the Smith River Community Hall. The purpose of the meeting was to introduce the project to the public and to request public input.
- November 2010: The USFWS was contacted to discuss the project's potential to affect marbled murrelet and northern spotted owl.
- September 2010: Informed the Smith River Rancheria Tribal Heritage Preservation Officer of the geoarchaeological testing results.
- August 2010: Discussed the inclusion of tribal designs on the bridge with the Smith River Rancheria and Elk Valley Rancheria Tribal Heritage Preservation Officers.
- August 2010: Phone conversation with the Smith River Rancheria Tribal Historic Preservation Officer about the planned geoarchaeological testing.
- July 2010: Notified the Smith River Rancheria Tribal Heritage Preservation Officer of the upcoming cultural resource work at the bridge and provided them a copy of the geoarchaeological fieldwork proposal.

2009

- October 2009: The RWQCB was contacted to discuss the project.
- October 2009: The USACE was contacted to discuss the project.
- October 2009: The CDFW was contacted to discuss the project.
- July 2009: The NMFS was contacted to discuss the project's potential to affect sensitive fish species.
- July 2009: The USFS Fisheries Scientist, of the Smith River National Recreation Area and Gasquet Ranger District of the Six Rivers National Forest, was contacted to discuss fisheries in the Smith River.

- July 2009: The USFS Wildlife Biologist, of the Smith River National Recreation Area and Gasquet Ranger District of the Six Rivers National Forest, was contacted to discuss marbled murrelet, northern spotted owl and other potential sensitive animals that may be in the project area.
- July 2009: The USFWS was contacted to discuss the project’s potential to affect marbled murrelet and northern spotted owl.
- June 2009: Provided geotechnical findings to the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers.
- May 2009: Updated the Smith River Rancheria Tribal Heritage Preservation Officer on the project status. The tribe asked if a native design could be integrated into the bridge somehow as a design element.
- March 2009: CDFW was contacted to discuss the project.
- March 2009: RWQCB was contacted to discuss the project.
- March 2009: USACE was contacted to discuss the project.
- March 2009: CDFW was contacted regarding the project’s potential to affect sensitive species.
- March 2009: NMFS was contacted to discuss the project’s potential to affect sensitive fish species.
- February 2009: Notified the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers of upcoming cultural resources investigations and provided a project update.
- February 2009: The Elk Valley Rancheria Tribal Heritage Preservation Officer informed Caltrans that they will defer monitoring and consultation for the current cultural investigations to the Smith River Rancheria. Consultation with the overall project and regular notifications to the Elk Valley Rancheria will still be required.

2008

- November 2008: Notified the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers of upcoming geotechnical drilling work and the need for cultural monitors.
- September 2008: Notified the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers of upcoming geotechnical drilling work and the need for cultural monitors.

- June 2008: Provided copies of the draft Extended Phase 1 archaeological survey to the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers.
- May 2008: Teleconference with the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers to discuss the monitoring needs for the geotechnical drilling and cultural resources studies.
- February 2008: Met at the project site with the Elk Valley Rancheria and the Smith River Rancheria Tribal Heritage Preservation Officers to discuss the project and any tribal concerns.
- January 2008: The USFWS was contacted to discuss the project's potential to affect sensitive plant species.

2007

- November 2007: Met at the tribal office with the Smith River Rancheria Tribal Historic Preservation Officer to introduce project and to discuss tribal concerns.
- October 2007: Sent consultation initiation letter to the Smith River Rancheria Tribal Heritage Preservation Officer.
- October 2007: Sent consultation initiation letter to the Elk Valley Rancheria Tribal Heritage Preservation Officer.
- July 2007: Contacted the Native American Heritage Commission to request a Sacred Lands File and list of potential interested parties and tribes.

2005

- October 2005: Met with the CCC to introduce the project.

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This document was prepared by the following current Caltrans staff:

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ICF, Jeff Peters, Martin Fisher, Nic Truscott. Contribution: Scour Effects Analysis.

ICF, Bill Mitchell. Contribution: Draft Biological Assessment.

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Appendix A Section 4(f)

This Section 4(f) documentation includes a *de minimis* determination for the Smith River Wild and Scenic (Recreational) Corridor. Following the de minimis determination, this Section 4(f) analysis also includes a discussion of the California Department of Fish and Game (CDFW) Smith River Public Fishing Access along Fred D. Haight Drive, which has been evaluated relative to the requirements of Section 4(f) but did not trigger protection under Section 4(f).

1.0 General Background

The proposed project will receive federal funding; therefore, it is subject to Section 4(f) analysis. The area within 0.5 mile of maximum disturbance limits (project footprint) for the three Build Alternatives was used to define the study area for existing publicly owned recreation and park properties, including local, regional, state and federal properties; existing play and sports fields of public schools with public access; publicly owned wildlife and water fowl refuges and conservation areas; portions of Wild and Scenic Rivers that are publicly owned and designated recreational; and existing off-street public bicycle, pedestrian, and equestrian trails. The study area was defined to identify an area large enough to assess the potential for the project to result in proximity impacts to properties protected under Section 4(f).

There are two public parks and recreation areas within 0.5 mile of the Build Alternatives. These include the following resources:

- Smith River Wild and Scenic (Recreational) Corridor
- CDFW Smith River Public Fishing Access

PROJECT DESCRIPTION AND ALTERNATIVES

The California Department of Transportation (Caltrans) proposes to replace the existing Smith River Bridge (Caltrans Bridge #01-0020), known as the Dr. Ernest Fine Memorial Bridge (referred to as the Dr. Fine Bridge hereinafter). The project is on U.S. Route 101 (U.S. 101) from Post Miles (PMs) 35.8 to 36.5, located immediately north of the community of Fort Dick and approximately 10 miles north of Crescent City in Del Norte County, California (Figure 1, all figures at end). Within the limits of the project, U.S. 101 is a conventional two-lane, undivided highway with two 12-foot lanes, 1-foot non-standard shoulders, and a 21-inch elevated sidewalk. Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and under the California Environmental Quality Act (CEQA). An Environmental Assessment (EA) will be prepared pursuant to NEPA and an Environmental Impact Report (EIR) will be prepared pursuant to CEQA.

The following three build alternatives and a no-build alternative are under consideration.

1. Cast-in-place West bridge on a new alignment
2. Pre-cast West bridge on a new alignment
3. Cast-in-place bridge on existing alignment.

Under all three Build Alternatives, the new two-lane bridge would have two 12-foot lanes, 8-foot shoulders, and a 6-foot-wide separated pedestrian walkway.

Under Alternative 1, the new bridge type would be a Cast-in-Place (CIP) Box Girder on isolation bearings with three piers (one pier in the active Smith River channel). Under

Alternative 2, the new bridge type would be a pre-cast slab bridge with two piers and three bents (two piers in the active Smith River channel). Under both Alternatives 1 and 2, the new bridge would be located west of the existing bridge alignment and the existing bridge would be utilized to carry traffic while the new bridge is constructed.

Under Alternative 3, the new bridge would be a CIP Box Girder on isolation bearings with three piers (one pier in the active Smith River channel). Under Alternative 3, a temporary detour bridge would be constructed east of the existing bridge and used to carry traffic while the new bridge is completed along the existing alignment.

The No Build Alternative would maintain the current conditions within the project limits (Section 1.7.3; pg. 39)

2.0 De Minimis Determination

This section of the document discusses *de minimis* impact determination under Section 4(f). 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, 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.

SMITH RIVER WILD AND SCENIC CORRIDOR

One recreational facility, the Smith River Wild and Scenic Corridor, managed by the National Park Service, has been determined to trigger the requirements for protection under Section 4(f).

Description of Activities, Features and Attributes

The Smith River is part of the National Wild and Scenic Rivers System, a federal system created by Congress to recognize and protect rivers across the country. More than 300 miles of the Smith River system are designated as a Wild and Scenic River—a longer stretch than any other river in the United States. The Smith River system is also undammed for its entire length, making it the only major river system in California without dams. The Smith River system drains a rugged area of the Pacific Coast ranges just south of the Oregon border, west of the Siskiyou Mountains, and north of the Klamath River Watershed.

The Smith River Wild and Scenic River System was designated in January 1981 and re-designated in November 1990 with the creation of the Smith River National Recreation Area. The 305,000-acre Smith River National Recreation Area, located within the Six Rivers National Forest approximately 3.25 miles east of the Dr. Fine Bridge project area, provides opportunities for fishing, rafting, kayaking, camping, hiking, backpacking, and picnicking. Of its 325.4 miles of Wild and Scenic River designation, 78 miles of the Smith River are classified as wild, 31 miles as scenic, and 216.4 miles as recreational.

The segment of the Smith River that encompasses the project area is designated "Recreational" under the federal and state Wild and Scenic River Acts. The designated segment is approximately 20 miles long, begins at the confluence of the Smith River Middle and South Forks, and runs to the mouth at the Pacific Ocean (NWSRS 2017). The Dr. Fine Bridge crosses the Smith River at the point where the river is transitioning into the coastal plain.

The Smith River near the project area is used by recreationalists for fishing, boating, bird watching, and other activities. The CDFW Smith River Public Fishing Access along Fred D. Haight Drive, located approximately 0.3 mile downstream of the project area, and the Ruby Van Deventer County Park, located approximately 2 miles upstream of the project area (Figure 2), provide public pedestrian and vehicular access, including boat launching, to the Smith River up and downstream of the project. There are no designated public trails within or adjacent to the project area.

Proposed "Use" of Section 4(f) Properties

Access to the river at existing public access points up and downstream of the project area (e.g., CDFW Smith River Fishing Access and the Ruby Van Deventer County Park) would not be affected by the project.

All three Build Alternatives will temporarily use recreational activities in the Smith River at the site of the new bridge during summer in-water construction seasons. Under all Build Alternatives, the portion of the river within the work limits (about 2.14 acres, or 200 linear feet) would be closed to all river-oriented activities, including recreational boating, fishing, swimming, and other in-water recreation between June 15 and October 15 in three consecutive years. Temporary gravel pads would be constructed in the channel and temporary construction trestles would be built to span the western pearlshell mussel bed and thalweg (the deepest part of the channel) along the southern side of the river for summer in-water work (June 15 – October 15). Water-based recreation access within the work limits would be prohibited from June 15th through October 15th for three consecutive construction seasons. Navigation of the Smith River will be affected during this time since boaters will not be able to pass through the project work area while the gravel berms are in place. Navigable on-water detours are not available; boaters wishing to move from up- to down-stream of the bridge work area would need to portage. After October 15th of every in-water construction season, the temporary gravel pad would be removed so the channel would be available again for boat passage and fishing use.

Figures 3-1 and 3-2 below show the estimated right-of-way needed under Alternative 1 or 2 and Alternative 3, respectively. Under the western alignment alternatives (Alternatives 1 or 2), a revised public agency lease would be required from the State Lands Commission on the downstream side of the bridge. Alternative 3 would not require a new land use lease. Under all build alternatives, a temporary construction easement from the State Lands Commission would be required within the Smith River for access, bridge and roadway work.

There is no exception to the temporary "use" of the Smith River Wild and Scenic Corridor because the project cannot meet all the five conditions of 23 CFR 774.13(d) in order to constitute an exception to the use. Specifically, the project would involve temporary interference with the ability of anglers and boaters to use the river within the project limits. Therefore, there is a temporary use for the purposes of section 4(f.)

In addition, the new bridge will also result in permanent use associated with the new bridge piers in the river channel. However, the new bridge would actually result in a decrease of the area in the river that is incorporated into the transportation facility because there will be fewer bridge piers and they will be less obtrusive compared to the existing bridge piers. Table 1-2 and Table 1-6 (Section 1.7.2 pg. 29; Section 1.8 pg.41) compare distinguishing elements of the build alternatives, alternatives considered but eliminated and the No Build alternatives. Alternatives 1 and 3 A&B would only have one pier and alternative 2 would have two piers in the active channel. In comparison to the current bridge which has 5 piers in the active channel.

Accessibility

The proposed project would not have any permanent impacts on access to the protected recreational features of the Smith River. As discussed above, the project would result in temporary access restrictions to the recreational features of the Smith River from June 15 to October 15 in three consecutive years of construction.

Table 1: 4(f) Resource: Smith River Wild and Scenic Corridor

Property Name	Description	Official Agency with Jurisdiction	Distance from Project Footprint	Type of Use
Smith River Wild and Scenic River Corridor, Recreational	**Location:** Smith River, from the confluence of the Smith River Middle and South Forks to the mouth at the Pacific Ocean. **Size:** The segment of the Smith River Wild and Scenic System (Recreational) that encompasses the project area is approximately 20 miles long, begins at the confluence of the Smith River Middle and South Forks, and runs to the mouth at the Pacific Ocean. **Distance from Project Footprint:** Within project footprint; nearest public access is 0.3 mile downstream and 2 miles upstream of the project footprint **Features:** Boating and fishing	National Park Service	0 feet	*De minimis*

After construction is complete, recreational conditions within the river would return to pre-construction or improved conditions. The proposed bridge (under all alternatives) would have fewer piles in the river, providing easier passage for boaters and on-water recreationists under the bridge.

Visual

Vegetation removal along the highway would lead to temporary and permanent visual impacts. It is anticipated that all three Alternatives would lead to potential adverse visual impacts for the residences and church as the viewers would have new views of the highway, retaining wall, and viaduct where there was once a dense vegetated screen. Vegetation removal would be temporary and tree removal would be permanent. Recreational users passing under the bridge would not be as sensitive to the changes in the visual impacts as residents since the duration of the recreational users view would be limited to the brief time it takes them to pass through the area of the new bridge.

Biological

The portion of the Smith River within the project area is not a designated wildlife or waterfowl refuge; it is protected for purposes of Section 4(f) for its recreational activities. While the Project would have some effects to wildlife and vegetation/trees, no proximity impacts to wildlife would permanently impact the recreational features or attributes of the Smith River Wild and Scenic Corridor.

Noise

As detailed in the Noise section of Chapter 2, the project would result in temporary noise increases associated with construction equipment and vehicles. Caltrans requires the construction contractor to conform to the provisions of Standard Specification, Section 14-8.02 “Noise Control” which states, “Control and monitor noise from work activities. Do not exceed 86 dBA LMax at 50 feet from the job site activities from 9:00 p.m. to 6:00 a.m.” Compared to residents, recreational users would have limited exposure to the increased construction noise and the temporary increase in noise levels would not impair the recreational features or attributes of the Smith River Wild and Scenic Corridor.

Why the Use is De Minimis

The temporary uses described above will not have more than a de minimis effect to the function of the Smith River Wild and Scenic Corridor and the impacts do not adversely affect the activities, features and attributes that qualify the property for protection under the requirements of Section 4(f).

Access to the Smith River corridor within the project limits will only be temporarily impacted for three months a year during the estimated 3-year construction duration. During this time, boaters, anglers, and swimmers will use existing public river access points up- and downstream of the project area (Figure 2). The nearest boat launch and public access to Smith River is the CDFW Smith River Fishing Access (about 0.3 miles downstream). There is no permanent use associated with the new bridge construction. The project construction would temporarily increase ambient noise levels on the river, especially during pile driving activities.

Hence, the temporary impacts to the Smith River for transportation use would not adversely affect the activities, features, and attributes of the Smith River Wild and Scenic Corridor. Also, as discussed above, there would be approximate temporary use of 2.14 acres or about 200 feet of river length, which represents less than 0.038 river miles (or less than 0.2%) of the 20-mile section of Smith River designated “Recreational”. These impacts would be minimized with the incorporation of measures (project features) discussed in the Avoidance, Minimization and/or Mitigation Measures Section. and

Because the new bridge would have fewer and less obtrusive piers than the existing bridge, the project would result in a net decrease in the area of the Smith River incorporated into the transportation facility.

For the reasons above and the inclusion of avoidance, minimization and mitigation measures, Caltrans has made a preliminary de minimis determination.

Avoidance, Minimization, and/or Mitigation Measures/Environmental Commitment Record (ECR)

The Environmental Commitments Record (ECR) brings all relevant environmental compliance information together in a single form. The purpose of the ECR is for recording environmental mitigation, compensation, and enhancement commitment for each individual project, specifying how each commitment will be met, and documenting the completion of each commitment. Caltrans has incorporated measures of avoidance, minimization, and mitigation or enhancement as conditions of the Project such that the uses of the park resource would not impact the activities, features, or attributes of the facility (in addition to the measures below, in depth discussion of avoidance, minimization, and mitigation measures are found throughout Chapter 2 of the Draft EIR/EA).

To minimize impacts to Land Use, Recreation, Noise and Visual/Aesthetics, the following project features and minimization measures are included in the proposed project for all build alternatives:

> **New Bridge Design.** Compared to the existing bridge, the new bridge would have fewer piers in the river channel and would provide a less obtrusive and more visually appealing structure.
>
> **Aesthetic Elements**. The new bridge would have aesthetic elements added, including tribal designs incorporated into the railing and retaining walls. Retaining walls would be stained an earthen color that blends with the surrounding environment.
>
> **Remove Gravel Berms and Construction Trestle Decks.** Under all build alternatives, temporary construction trestle decks and gravel berms would be removed from the river prior to October 15 each year.
>
> **Minimize Construction Noise.** In order to avoid exceeding 86 A-weighted decibel (dBA) maximum sound level (LMax) at 50 feet from the job site activities during nighttime hours, the following could be implemented to minimize noise under direction from the Resident Engineer: changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and installing acoustic barriers around stationary construction noise sources.
>
> **Public Outreach.** Outreach would be conducted to ensure the public is aware that river access would be limited during construction activities. Outreach to the boating community would be conducted before and during construction to notify users of river closures.

River Access and Signage. Existing pedestrian access to the Smith River at the south side of the Dr. Fine Bridge will continue after project completion. Vehicular access will be prohibited to prevent illicit dumping and restore vegetation. A sign will be posted at this location providing information about nearby vehicular access and boat launching points. Additionally, Caltrans will work with CDFW to improve signage along Fred D. Haight Drive directing recreation users to the existing CDFW Smith River Public Fishing Access, located less than 1 mile downstream of the bridge.

Maintain Access to Driveways and Public Roads. The contractor would be required to minimize any access delays to driveways or public roadways (including Fred Haight Drive, which leads to the downstream CDFW Fishing Access) within or near the work zones.

VA-1: **Bridge Aesthetic Treatment.** Aesthetic treatment to the bridges would be included, such as Tolowa Dee-Ni' Nation and Elk Valley Rancheria Tribal patterns, to address context sensitivity.

VA-2: Replant Riparian and Wetland Areas. Riparian and wetland areas affected would be replanted with regionally appropriate native plants.

VA-3: Restore Temporary Access and Staging Areas. Any temporary access roads or staging areas would be restored to a natural contour and revegetated with appropriate native plants. Plant species and methods for installation would be developed by the project landscape architect and revegetation specialist.

VA-4: **Bridge Railing Design.** Appropriate railing that is see-through would be installed to provide more visibility to the surrounding natural elements. Railings would be painted or stained with a color that enhances visual character and memorability of the bridge.

VA-5: Avoid and Minimize Tree Removal. The removal of established trees and vegetation would be avoided and minimized, where feasible. Existing trees of significant size and maturity would be preserved and protected during construction, where feasible. Environmentally sensitive area (ESA) fencing would be installed to demarcate areas where vegetation would be preserved and root systems of trees would be protected.

VA-9: Boulders on South Bank Road. Boulders placed on the south bank to inhibit vehicular access from South Bank Road would match the color of existing stone within the project area to blend with the natural surrounding environment.

Consultation and Coordination with the Official Jurisdiction

Caltrans initiated consultation with the National Park Service with regards to the characterization of effects of the project in the context of this Section 4(f) analysis, consistent with 49 USC 303(d)(3)(B) in April of 2013. This Section 4(f) De Minimis Analysis will be made available for a 30-day public review period. After circulation of the public review period and prior to finalizing the Environmental Impact Report (EIR)/ Environmental Assessment (EA), a request will be sent to the National Park Service for concurrence on this de minimis determination. This Section 4(f) Resource documentation will be included as an attachment to the EIR/EA.

3.0 Resources Evaluated Relative to the Requirements of Section 4(f): No-Use Determination

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."

This section of the document discusses parks and recreational facilities found within or next to (within 0.5 mile of) the project area that do not trigger Section 4(f) protection because: 1) they are not publicly owned, 2) they are not open to the public, 3) they are not eligible historic properties, or 4) the project does not permanently use the property and does not hinder the preservation of the property.

The only publicly owned recreation facility within 0.5 mile of the project area is the CDFW Smith River Public Fishing Access off Fred D. Haight Drive.

SMITH RIVER PUBLIC FISHING ACCESS

Located about 0.3 miles downstream of the Dr. Fine Bridge at 3145 South Fred D Haight Drive, the Smith River Public Fishing Access provides public boat launching onto the Smith River. The Smith River Public Fishing Access is managed by CDFW and has parking and river access for boaters and recreation users. .

There would be no use of land from this property under Section 4(f) (permanent incorporation of land from the property into the transportation facility), and there are no temporary construction easements (TCEs) or other temporary occupancies within the boundaries of the facility under all three Build Alternatives. During project construction, access to Fred D. Haight Drive from U.S. 101 will remain open. There is no permanent or temporary occupancy of land from the CDFW Smith River Public Fishing Access under the Build Alternatives; therefore, the requirements for protection under Section 4(f) are not triggered.

In terms of proximity or constructive use impacts, no staging areas or vehicular restrictions near the public fishing access are proposed, no substantial long term visual impacts will occur, no long-term substantial noise impacts are anticipated, and operation of the new bridge would not result in any direct or indirect impacts on the fishing access facility. Both because of the geographic distance, including intervening natural features between the

CDFW fishing access and the bridge, and because of the limited nature of construction activities, there would be no impacts that would rise to the level of substantial impairment.

The CDFW Smith River Public Fishing Access is a Section 4(f) property, but no “use” will occur. Therefore, the provisions of Section 4(f) do not apply.

OTHER PROPERTIES CONSIDERED

Other than the CDFW Public Fishing Access 0.3 miles downstream, properties abutting the Smith River along both banks in the project vicinity are privately owned and public access is restricted. There is currently informal public access to the Smith River under the existing bridge on the southern bank. This area is on state-owned (Caltrans) property and is not actively managed for public access or recreational use; nor is the property designated a park, wildlife refuge, recreational area, or an official river access point. Therefore, the provisions of Section 4(f) do not apply to these properties.

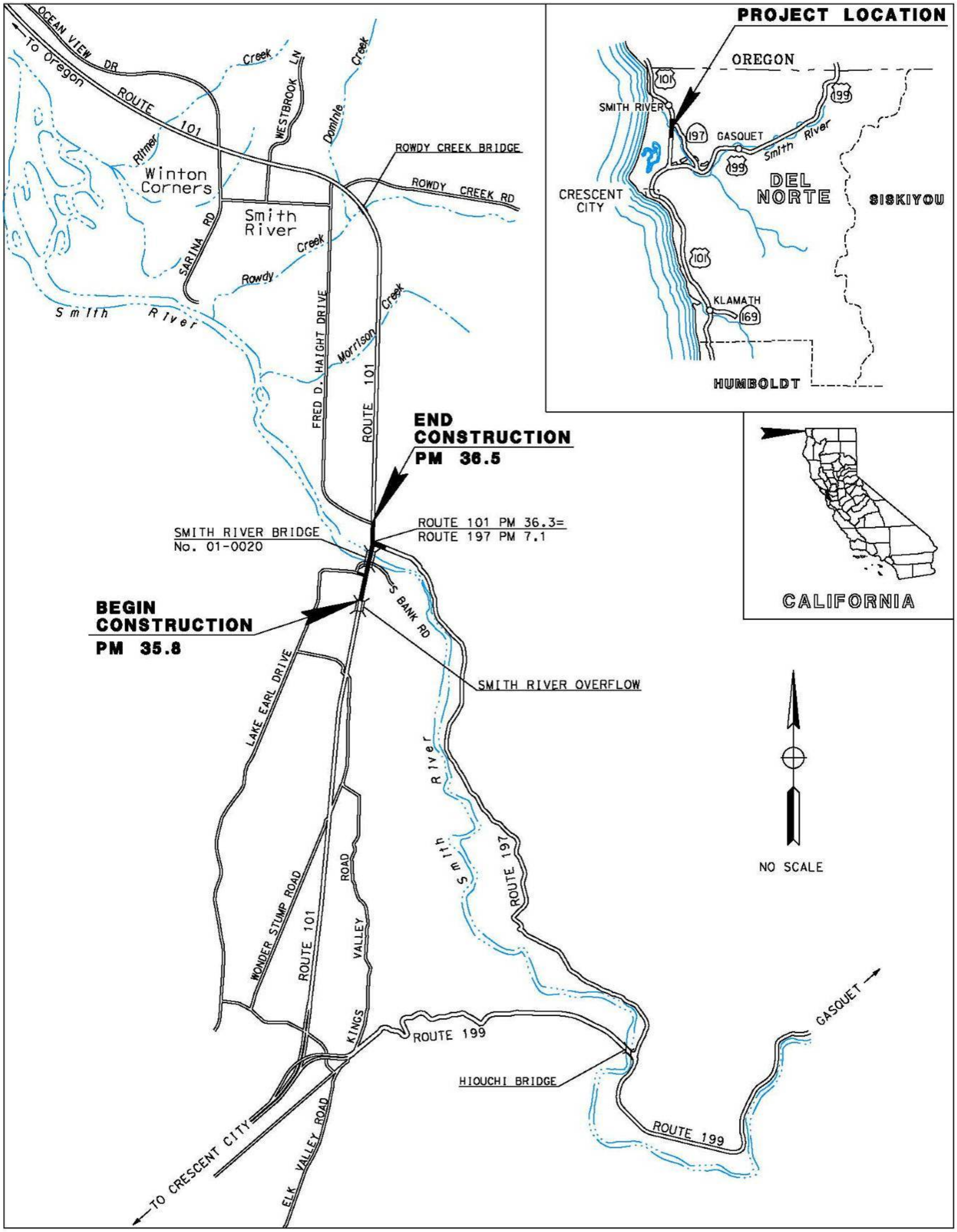

Figure 1. Project Vicinity and Location

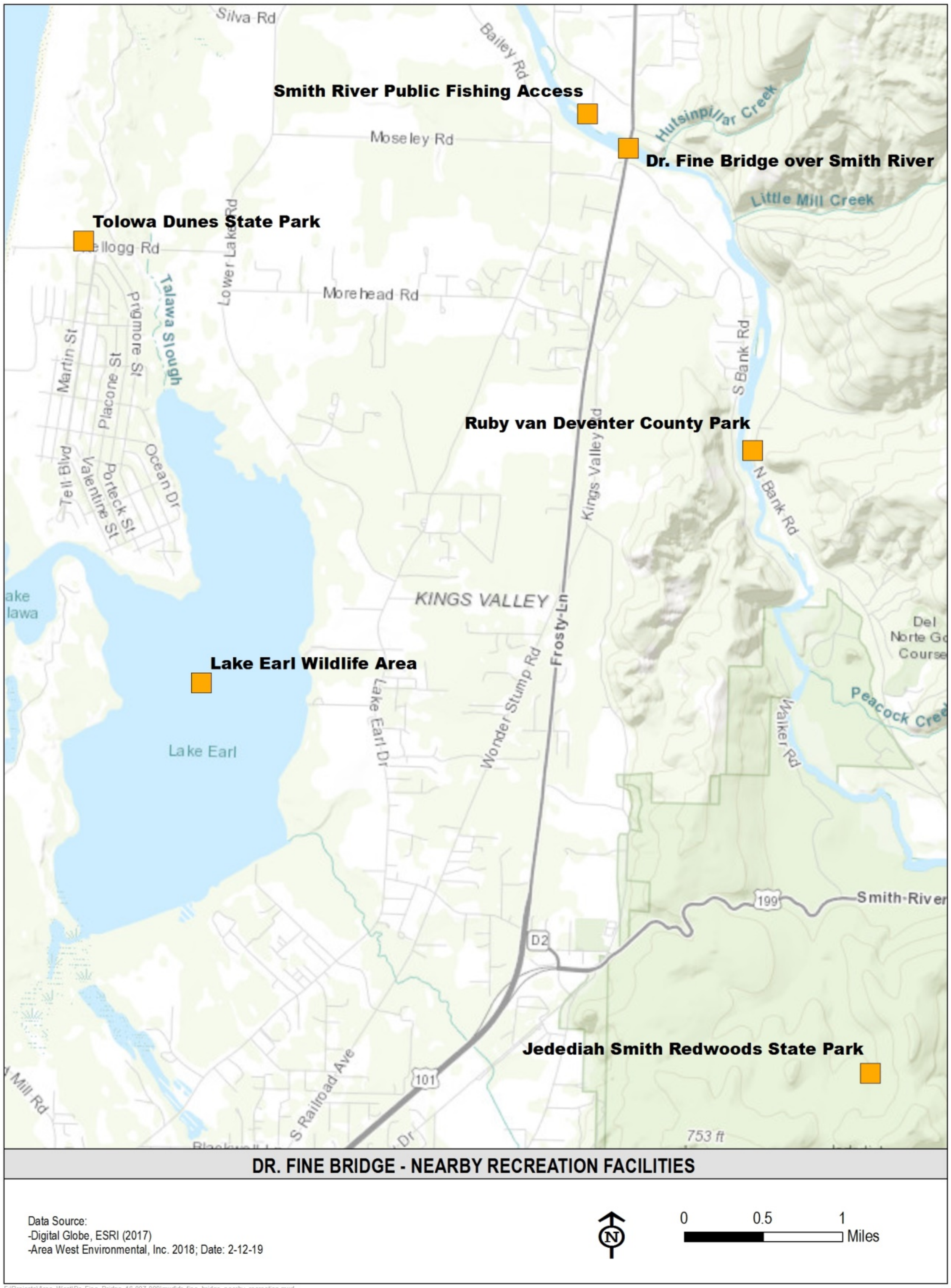

Figure 2. Recreational Facilities Near the Project

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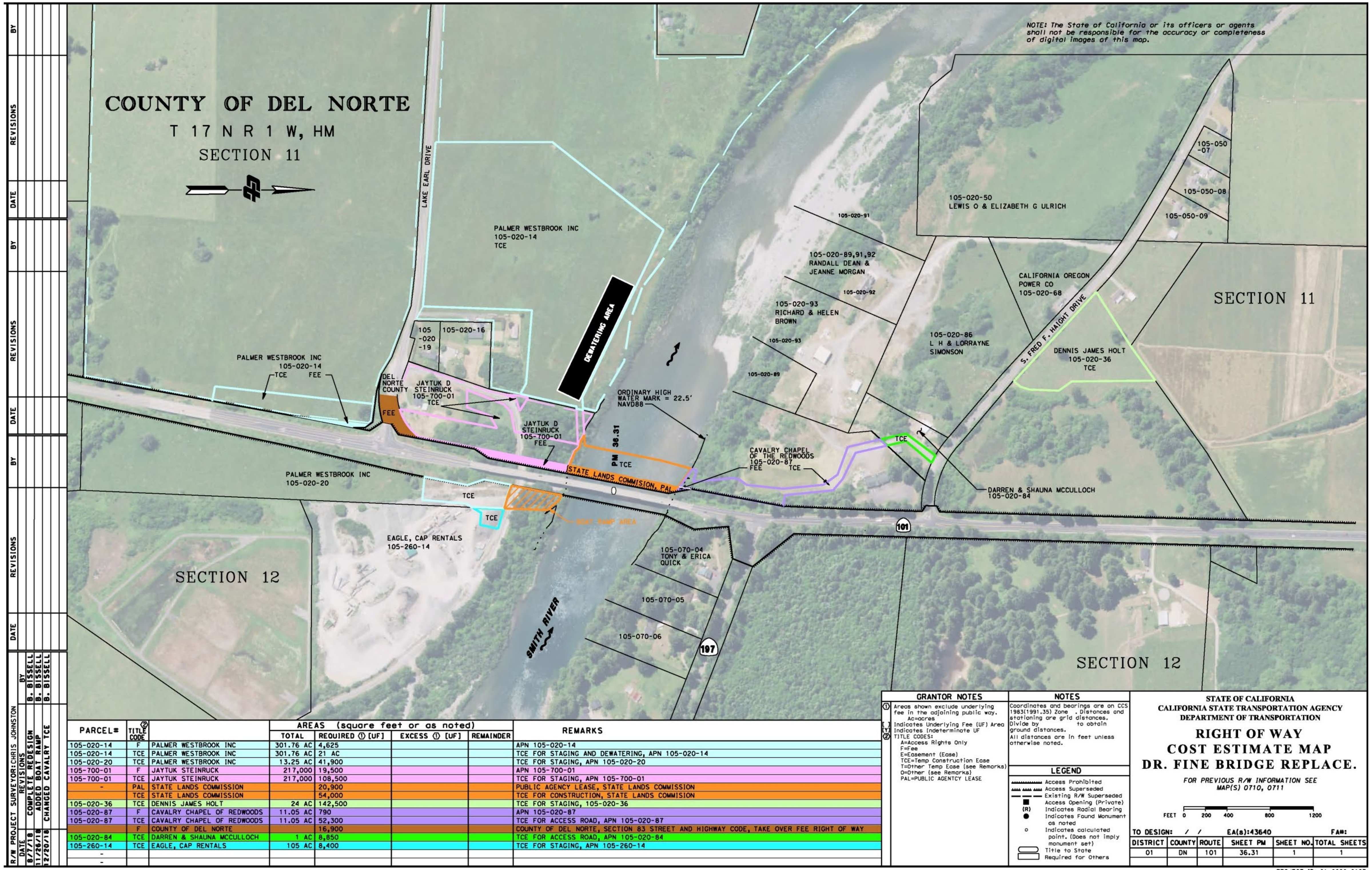

PARCEL#	TITLE CODE (2)		AREAS (square feet or as noted) TOTAL	REQUIRED (1) [UF]	EXCESS (1) [UF]	REMAINDER	REMARKS
105-020-14	F	PALMER WESTBROOK INC	301.76 AC	4,625			APN 105-020-14
105-020-14	TCE	PALMER WESTBROOK INC	301.76 AC	21 AC			TCE FOR STAGING AND DEWATERING, APN 105-020-14
105-020-20	TCE	PALMER WESTBROOK INC	13.25 AC	41,900			TCE FOR STAGING, APN 105-020-20
105-700-01	F	JAYTUK STEINRUCK	217,000	19,500			APN 105-700-01
105-700-01	TCE	JAYTUK STEINRUCK	217,000	108,500			TCE FOR STAGING, APN 105-700-01
-	PAL	STATE LANDS COMMISSION		20,900			PUBLIC AGENCY LEASE, STATE LANDS COMMISSION
	TCE	STATE LANDS COMMISSION		54,000			TCE FOR CONSTRUCTION, STATE LANDS COMMISION
105-020-36	TCE	DENNIS JAMES HOLT	24 AC	142,500			TCE FOR STAGING, 105-020-36
105-020-87	F	CAVALRY CHAPEL OF REDWOODS	11.05 AC	790			APN 105-020-87
105-020-87	TCE	CAVALRY CHAPEL OF REDWOODS	11.05 AC	52,300			TCE FOR ACCESS ROAD, APN 105-020-87
	F	COUNTY OF DEL NORTE		16,900			COUNTY OF DEL NORTE, SECTION 83 STREET AND HIGHWAY CODE, TAKE OVER FEE RIGHT OF WAY
105-020-84	TCE	DARREN & SHAUNA MCCULLOCH	1 AC	8,850			TCE FOR ACCESS ROAD, APN 105-020-84
105-260-14	TCE	EAGLE, CAP RENTALS	105 AC	8,400			TCE FOR STAGING, APN 105-260-14
-							
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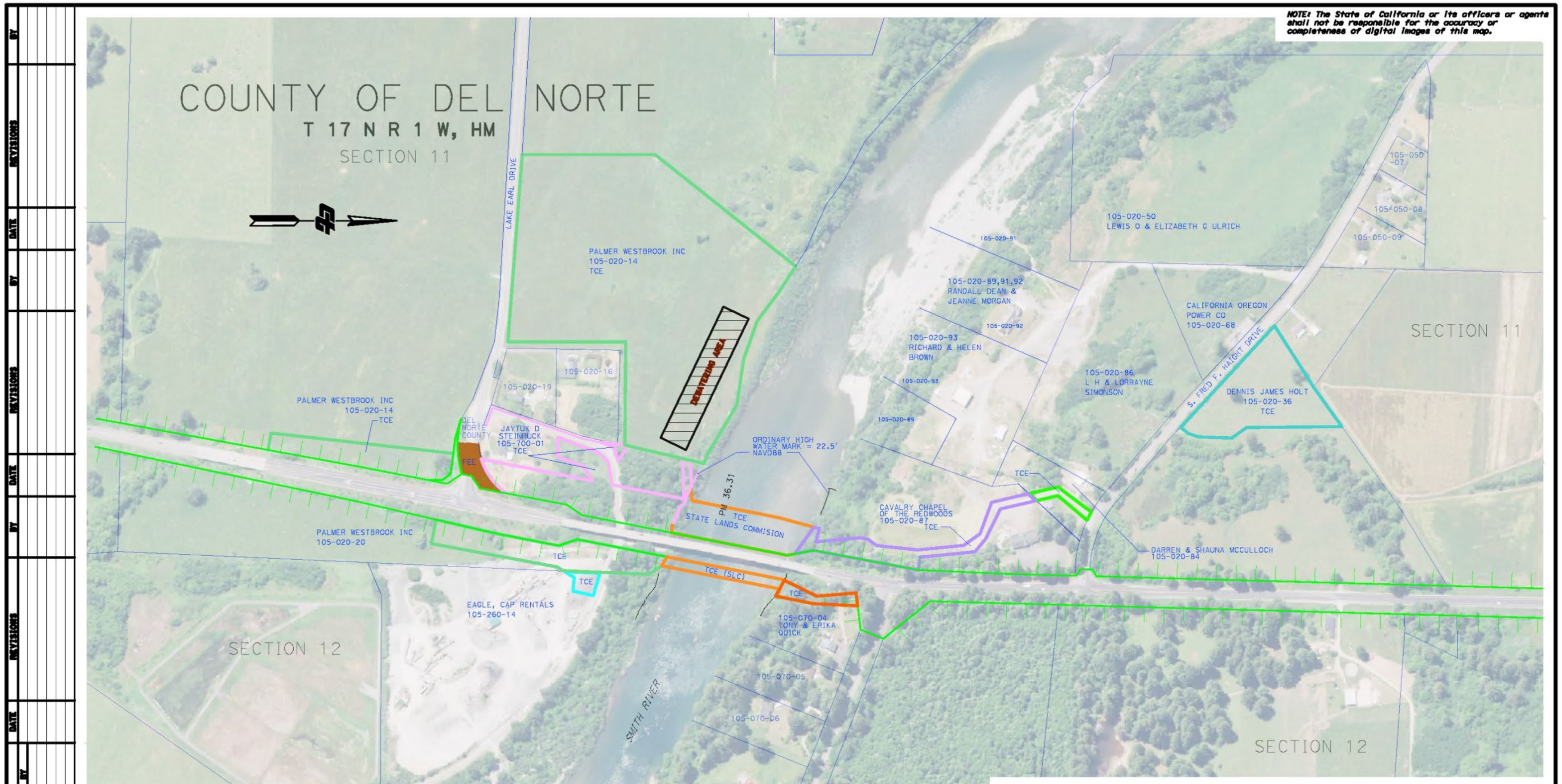
Figure 3-1. Right-of-Way Requirements for Alternative 1 and 2



PARCEL®	TITLE CODE ①	GRANTOR	AREAS (square feet or as noted) TOTAL	REQUIRED [UF]	EXCESS [UF]	REMAINDER	REMARKS	RECORDATION TYPE②	DATE	DOC.#③
105-020-14	TCE	PALMER WESTBROOK, INC.	301.76 AC.	21.1 AC.			TCE FOR STAGING AND DEWATERING			
105-020-20	TCE	PALMER WESTBROOK, INC	13.25 AC.	90,810			TCE FOR STAGING			
105-700-01	TCE	JAYTUK STEINRUCK	217,000	128,000			TCE FOR STAGING			
	TCE	STATE LANDS COMMISSION		95,200			TCE FOR CONSTRUCTION			
105-020-36	TCE	DENNIS JAMES HOLT	24 AC.	142,500			TCE FOR STAGING			
105-020-87	TCE	CALVARY CHAPEL OF REDWOODS	11.05 AC.	53,540			TCE FOR ACCESS ROAD			
	F	COUNTY OF DEL NORTE		16,900			COUNTY OF DEL NORTE, SECTION 83 STREET AND HIGHWAY CODE TAKE OVER FEE RIGHT OF WAY			
105-020-84	TCE	DARREN & SHAUNA McCULLOCH	1 AC.	8,850			TCE FOR ACCESS ROAD			
105-260-14	TCE	EAGLE CAP RENTALS	105 AC.	8,400			TCE FOR STAGING			
105-070-04	TCE	TONY & ERIKA QUICK	2.3 AC.	14,890						

STATE OF CALIFORNIA
CALIFORNIA STATE TRANSPORTATION AGENCY
DEPARTMENT OF TRANSPORTATION
RIGHT OF WAY
COST ESTIMATE MAP
DR. FINE BRIDGE - ALT 3

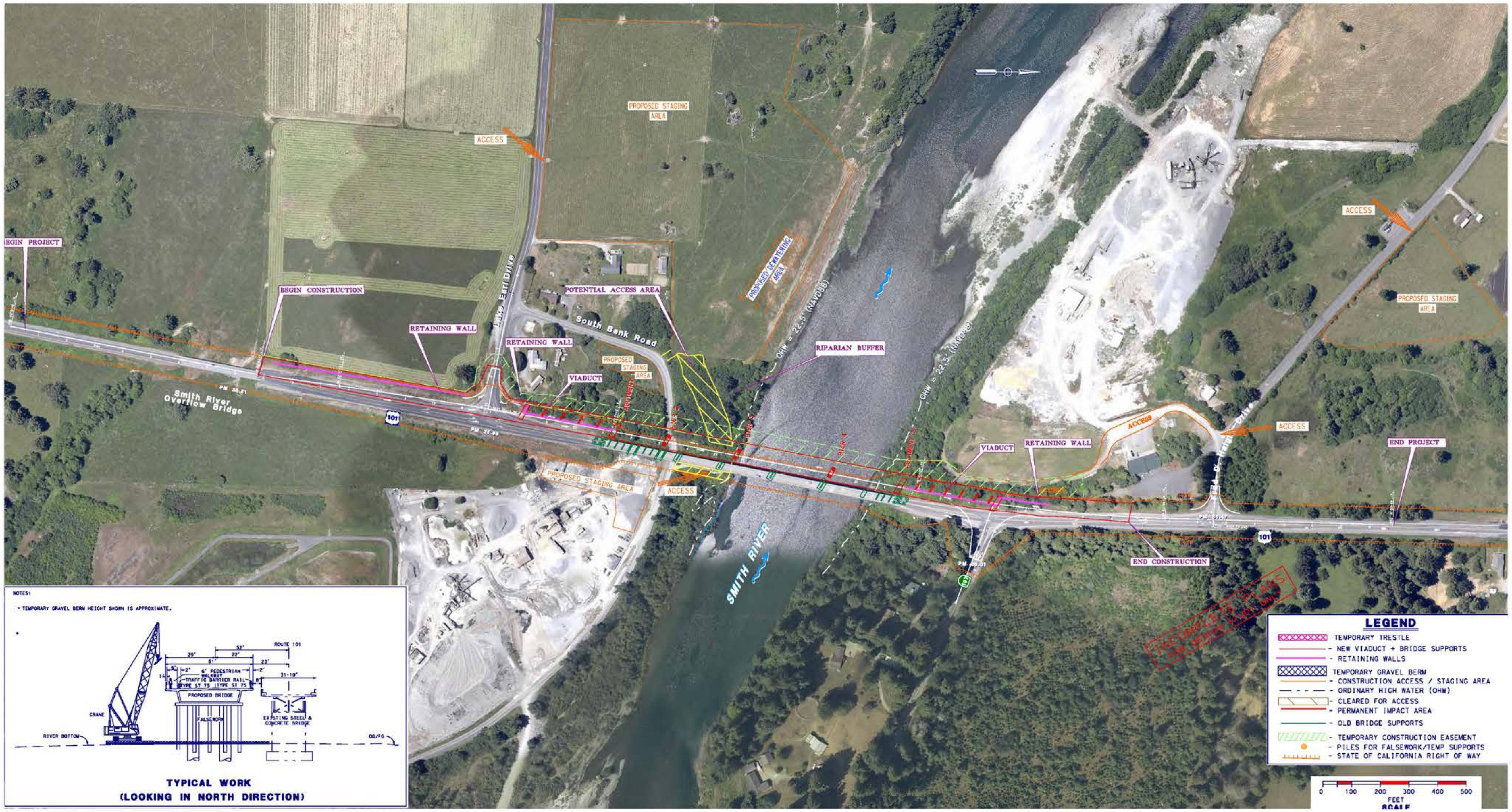
Figure 3-2. Right-of-Way Requirements for Alternative 3

Appendix B General Layouts for Each Build Alternative

* AERIAL PHOTO - 1/22/2019
* DISPLAY CREATED ON 1/22/2019 BY D3 DESIGN, CALTRANS

ALTERNATIVE 1 CAST-IN-PLACE

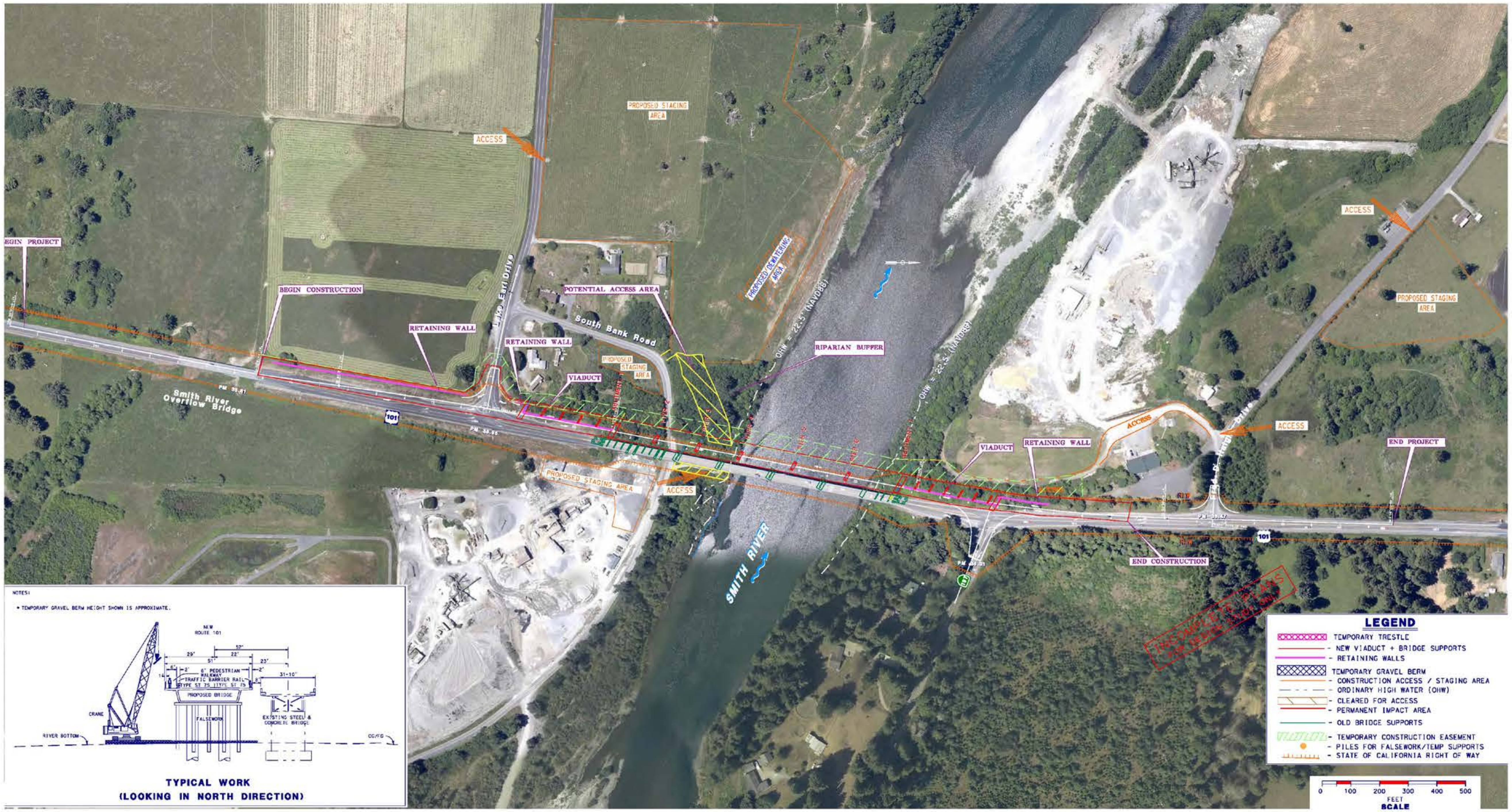
LAYOUT1: GENERAL MAP
NEW BRIDGE ON NEW WEST ALIGNMENT

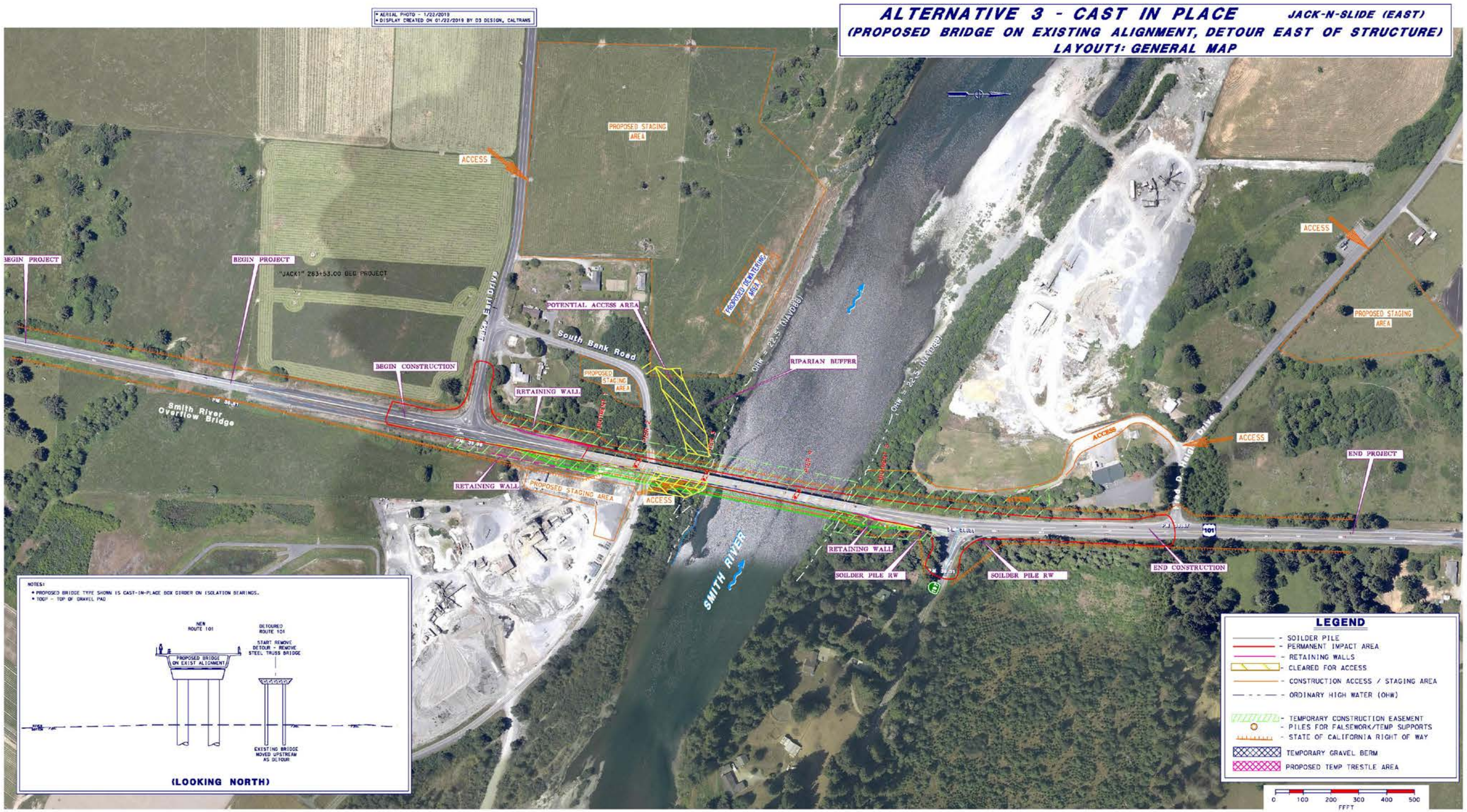


* AERIAL PHOTO - 7/15/2015
* DISPLAY CREATED ON 10/18/2018 BY D3 DESIGN, CALTRANS

ALTERNATIVE 2 PRE CAST

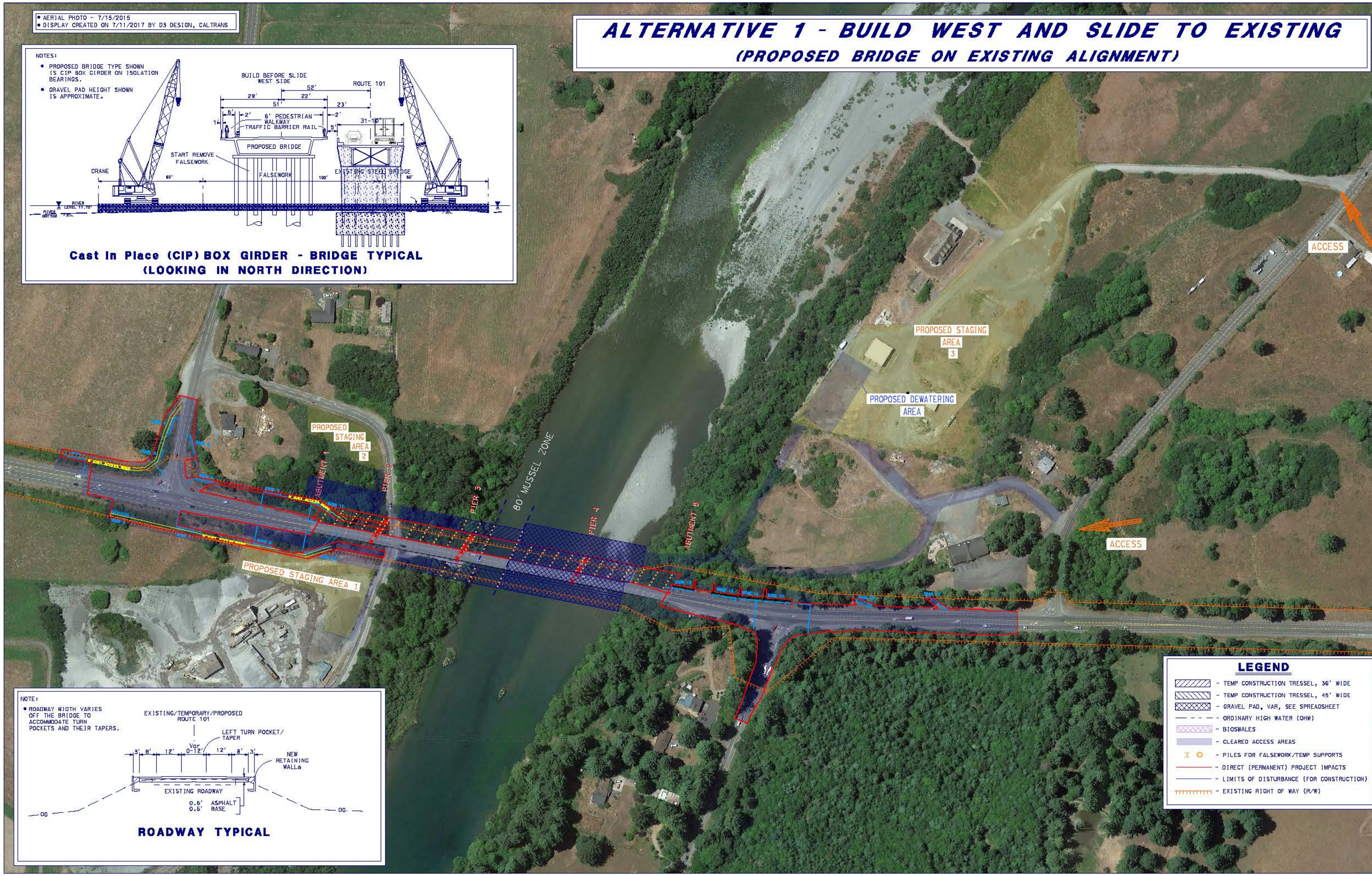
LAYOUT 1: GENERAL MAP
NEW BRIDGE ON NEW WEST ALIGNMENT



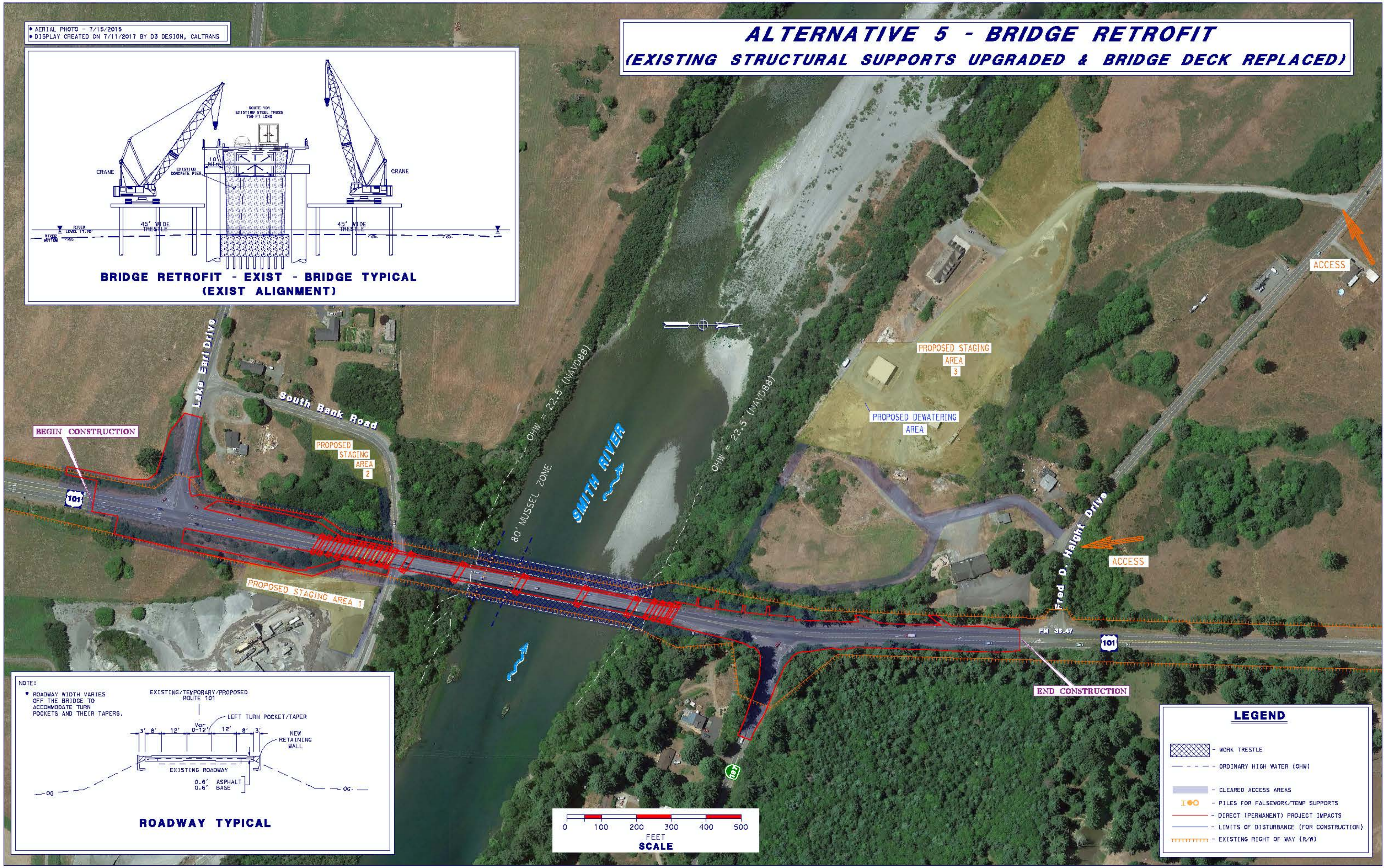


ALTERNATIVE 3 - CAST IN PLACE JACK-N-SLIDE (EAST)
(PROPOSED BRIDGE ON EXISTING ALIGNMENT, DETOUR EAST OF STRUCTURE)
LAYOUT1: GENERAL MAP
PROPOSED STAGING AREA
ACCESS
BEGIN PROJECT
BEGIN CONSTRUCTION
RETAINING WALL
South Bank Road
POTENTIAL ACCESS AREA
RIPARIAN BUFFER
Smith River Overflow Bridge
PROPOSED STAGING AREA
SMITH RIVER
SOILDER PILE RW
END CONSTRUCTION
END PROJECT
(LOOKING NORTH)
LEGEND
- SOILDER PILE
- PERMANENT IMPACT AREA
- RETAINING WALLS
- CLEARED FOR ACCESS
- CONSTRUCTION ACCESS / STAGING AREA
- ORDINARY HIGH WATER (OHW)
- TEMPORARY CONSTRUCTION EASEMENT
- PILES FOR FALSEWORK/TEMP SUPPORTS
- STATE OF CALIFORNIA RIGHT OF WAY
TEMPORARY GRAVEL BERM
PROPOSED TEMP TRESTLE AREA

Appendix C Layouts of Alternatives Considered but Eliminated from Further Consideration



ALTERNATIVE 1 - BUILD WEST AND SLIDE TO EXISTING
(PROPOSED BRIDGE ON EXISTING ALIGNMENT)
• AERIAL PHOTO - 7/15/2015
• DISPLAY CREATED ON 7/11/2017 BY D3 DESIGN, CALTRANS
NOTES:
• PROPOSED BRIDGE TYPE SHOWN IS CIP BOX GIRDER ON ISOLATION BEARINGS.
• GRAVEL PAD HEIGHT SHOWN IS APPROXIMATE.
BUILD BEFORE SLIDE WEST SIDE
ROUTE 101
6' PEDESTRIAN WALKWAY
TRAFFIC BARRIER RAIL
PROPOSED BRIDGE
START REMOVE FALSEWORK
FALSEWORK
EXISTING STEEL BRIDGE
CRANE
Cast In Place (CIP) BOX GIRDER - BRIDGE TYPICAL
(LOOKING IN NORTH DIRECTION)
PROPOSED STAGING AREA 3
PROPOSED DEWATERING AREA
ACCESS
PROPOSED STAGING AREA 2
ABUTMENT 1
PIER 2
PIER 3
80' MUSSEL ZONE
PIER 4
ABUTMENT 5
PROPOSED STAGING AREA 1
ACCESS
NOTE:
• ROADWAY WIDTH VARIES OFF THE BRIDGE TO ACCOMMODATE TURN POCKETS AND THEIR TAPERS.
EXISTING/TEMPORARY/PROPOSED ROUTE 101
LEFT TURN POCKET/ TAPER
NEW RETAINING WALLS
EXISTING ROADWAY
0.5' ASPHALT
0.5' BASE
ROADWAY TYPICAL
LEGEND
- TEMP CONSTRUCTION TRESSEL, 36' WIDE
- TEMP CONSTRUCTION TRESSEL, 45' WIDE
- GRAVEL PAD, VAR, SEE SPREADSHEET
- ORDINARY HIGH WATER (OHW)
- BIOSWALES
- CLEARED ACCESS AREAS
- PILES FOR FALSEWORK/TEMP SUPPORTS
- DIRECT (PERMANENT) PROJECT IMPACTS
- LIMITS OF DISTURBANCE (FOR CONSTRUCTION)
- EXISTING RIGHT OF WAY (R/W)



ALTERNATIVE 5 - BRIDGE RETROFIT
(EXISTING STRUCTURAL SUPPORTS UPGRADED & BRIDGE DECK REPLACED)
AERIAL PHOTO - 7/15/2015
DISPLAY CREATED ON 7/11/2017 BY D3 DESIGN, CALTRANS
BRIDGE RETROFIT - EXIST - BRIDGE TYPICAL
(EXIST ALIGNMENT)
CRANE
CRANE
45' WIDE TRESTLE
45' WIDE TRESTLE
BEGIN CONSTRUCTION
END CONSTRUCTION
Lake Earl Drive
South Bank Road
Fred D. Haight Drive
SMITH RIVER
OHW = 22.5' (NAVD88)
OHW = 22.5' (NAVD88)
80' MUSSEL ZONE
PROPOSED STAGING AREA 1
PROPOSED STAGING AREA 2
PROPOSED STAGING AREA 3
PROPOSED DEWATERING AREA
ACCESS
ACCESS
101
101
NOTE:
ROADWAY WIDTH VARIES OFF THE BRIDGE TO ACCOMMODATE TURN POCKETS AND THEIR TAPERS.
EXISTING/TEMPORARY/PROPOSED ROUTE 101
LEFT TURN POCKET/TAPER
NEW RETAINING WALL
EXISTING ROADWAY
0.6' ASPHALT
0.6' BASE
ROADWAY TYPICAL
0 100 200 300 400 500
FEET
SCALE
LEGEND
- WORK TRESTLE
- ORDINARY HIGH WATER (OHW)
- CLEARED ACCESS AREAS
- PILES FOR FALSEWORK/TEMP SUPPORTS
- DIRECT (PERMANENT) PROJECT IMPACTS
- LIMITS OF DISTURBANCE (FOR CONSTRUCTION)
- EXISTING RIGHT OF WAY (R/W)

Appendix D Notice of Preparation

SCH NO. ____________________

NOTICE OF PREPARATION

To: State Clearinghouse
Office of Planning and Research
P.O. Box 3044

Sacramento, CA 95812

From: California Dept. of Transportation
P.O. Box 3700
Attn: Steven Grantham

Eureka, CA 95502

Subject: **Notice of Preparation of a Draft Environmental Impact Report**
Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

Project Title: Dr. Fine Bridge Replacement Project

Project Location: The proposed project is located north of Crescent City, in Del Norte County on US Route 101 (US 101) at post-miles 35.8 to 36.5. The project would replace the existing Smith River Bridge (Br. No. 1-20), commonly known as the Dr. Fine Bridge, which was built in 1940.

Project Description: The project would replace the physically deficient and functionally obsolete Dr. Fine Bridge with a two-lane structure. The structure would posses an acceleration lane and standard shoulders that meet current design standards and demands. The proposed bridge would include two through lanes (12-feet each), an acceleration lane for southbound traffic (12 feet wide), and two standard 8-foot shoulders to meet current design standards. Additionally, there would be a 5-foot wide pedestrian walkway added to the west side of the structure. There would also be see-through traffic barriers on each side of the travel way and a pedestrian handrail on the outside of the walkway. Depending on the width needed for the traffic barriers and hand railing, the total planned width of the new bridge would be approximately 62 feet.

Purpose of Notice: This Notice of Preparation indicates that the California Department of Transportation will be the lead agency for federal and state environmental review and will prepare an environmental impact report/environmental assessment (EIR/EA) for the project. Your participation as a responsible agency or interested member of the public is requested in the preparation and review of this document.

Caltrans seeks the views of agencies, public interest groups, and interested individuals with regard to the scope and content of the environmental documents as is relevant to statutory responsibilities and public interest. Agencies may refer to the EIR/EA when considering permit applications or other approvals for the project.

A more detailed project description, location map, and the potential environmental effects are contained in the attached materials.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please direct your response to Steven Grantham at the address shown above or by telephone at (707) 445-7815. If responding for an agency or interest group, please provide a persons name and contact information.

Date 10.18.10

Signature for Cindy Anderson
Title Chief, ~~North~~ Region Environmental Services (North)

Dr. Fine Bridge Replacement Project
01-DN-101-PM 35.8-36.8
EA 01-43640

Project Description

This project would replace the Dr. Fine Bridge (Smith River Bridge Number 1-20) with a new bridge consisting of two through lanes (12-feet each), an acceleration lane for southbound traffic (12 feet wide), and standard 8-foot shoulders to meet current design standards. Additionally, there would be a 5-foot wide pedestrian walkway added to the west side of the structure. There would also be see-through traffic barriers on each side of the travel way and a pedestrian handrail on the outside of the walkway.

Scope of Work Description

Project features include:

- Approximately 75,000 cubic yards of imported borrow would be needed
- The project includes modifications to the existing drainage systems, involving new and/or modifications to cross culverts and down drains. Rock slope protection (RSP) may be needed at the abutments, and RSP would be installed at culvert outlets to help prevent scour. Concentrated flows would be collected in drains and channels.
- Underground and overhead communication and electric utility facilities would need to be relocated. Conduits would be provided on the new structure for communication lines.
- Staging areas would be needed both north and south of the river. Staging areas have yet to be determined.
- Right of way acquisition would be required. The area needed depends on the ultimate alignment of the preferred alternative. Temporary easements would be obtained along both sides of State Route 101 and State Route 197 for construction, access and staging areas.
- Traffic control would be needed occasionally, as some operations would be close to the existing traffic. Minor delays to the traveling public are anticipated. Bicycles and pedestrians would be accommodated thru the work zone. It is assumed that there would be some night work, but only during critical operations.
- Trestles would be used for access in and near the river. It is assumed the trestles would remain in the waterway through the year.
- Cofferdams would be used at the foundations for foundation construction and removal. It is assumed the cofferdams would remain in the waterway through the year.
- Falsework would be used to construct the new bridge. It is assumed the falsework would remain in the waterway through the year.
- The State Route 101/197 intersection (on the north) and the intersection with State Route 101/Lake Earl Drive (on the south) would need to be reconstructed.
- Lighting at the State Route 101/197 and Lake Earl Drive intersections would be improved.

- The project would incorporate re-establishment of the existing United States Geological Survey (USGS) river gage near the north side of the bridge.
- Geotechnical investigations would be done at each proposed column location and at approach fills.

Possible Highway Alignments

There are four highway re-alignment alternatives that are being considered. They are:

- Construct a new bridge west (Alternative 1W) of the existing bridge.
- Construct a new bridge east (Alternative 1E) of the existing bridge.
- Construct a new bridge west (Alternative 2W) of the existing bridge in stages. Construct only the amount of roadway needed during Stage 1, then remove the existing bridge and construct the remaining portion of the bridge.
- Construct a new bridge west (Alternative 2E) of the existing bridge in stages. Construct only the amount of roadway needed during Stage 1, then remove the existing bridge and construct the remaining portion of the bridge.

Bridge Design Variations

A concrete box girder bridge is proposed. Variations to the soffit shape, number of columns, span lengths, aesthetics, methods of construction and other design elements are being considered.

It is expected to take a minimum of three seasons to complete the bridge replacement. The foundation work would be done during the first season. Superstructure construction would be undertaken during the second season, and demolition and cleanup would be done during the third season. Depending on the type of structure, construction may take upwards of two additional seasons.

Typical equipment used for construction and demolition include: pavers, cranes, hoe rams, pile drivers, vibratory hammers, excavators, backhoes, hauling and dump trucks, compactors, portable generators, boom trucks, concrete trucks, saws, pumps, jackhammers, site trailers, storage boxes, and mobile filtration boxes.

Purpose and Need

The project's purpose is to replace Dr. Fine Bridge on Highway 101 over the Smith River. The project is needed because the Dr. Fine Bridge is physically deficient and functionally obsolete. Its structural members are fracture critical, and its deck and rails do not meet current standard(s). The bridge is located in a scour and seismically vulnerable location.

The purpose of the project is to replace the physically deficient and functionally obsolete Dr. Fine Bridge with a two-lane structure, with an acceleration lane and standard shoulders to meet current design standards and demands. Dr. Fine Bridge, built in 1940, has exceed its 50-year design life and is degrading by several mechanisms. The bridge was identified as having facture critical steel members, a narrow deck, nonstandard bridge rail, is in a potentially scour and seismically vulnerable location.

This project is needed to address the physical deficiencies of the structure. Widening the shoulder to 8 feet will improve safety for motorists and bicyclists, as this portion of the Highway 101 is part of the Pacific Coast Bike Route. The proposed two-lane bridge with and acceleration lane will bring the highway up to current standards and facilitate the safe merging of traffic from Route 197 to southbound Route 101.

Dr. Fine Bridge Replacement
DN-101 Post Miles 35.8 – 36.5

Summary of potential environmental impacts:

PERMANENT IMPACTS: Based on the current project description, there would be permanent environmental impacts resulting from the project.

BIOLOGICAL IMPACTS

Primarily due to a slight alignment shift as part of the bridge replacement, the project as currently designed is anticipated to have permanent wetland impacts. Design measures to minimize the footprint where feasible would be incorporated into the project plans.

Anadromous fish are expected to be harmed or killed during project construction and demolition.

Wetland impacts: Approximately 2.7 acres of permanent wetlands impacts are anticipated for the western alignment. Approximately 1.8 acres of permanent wetland impacts are anticipated for the eastern alignment.

Riparian and Essential Fish Habitat: Approximately 2.5 acres of permanent riparian impacts are anticipated for the western alignment. Approximately 1.7 acres of permanent riparian impacts are anticipated for the eastern alignment.
Riparian area is a constituent of essential fish habitat.

Anadromous fish impacts: An indeterminate number of anadromous fish would be taken during the project.

ARCHAEOLOGICAL RESOURCES

Archaeological analysis within the project's Area of Potential Effects (APE), including an archaeological survey and exploratory archaeological testing, has determined that no historic resources would be affected by any of the alignments.

COMMUNITY IMPACTS

Agricultural land: There is likely to be permanent loss of .2 acres prime agriculture land regardless of the alignment.

Recreational access: There is unlikely to be permanent loss of access to the Smith River for recreational purposes.

Aesthetics: There is unlikely to be permanent impacts to aesthetics in the project area.

PHYSICAL IMPACTS

Geology: The new bridge would replace a bridge that is susceptible to earthquake.

Hazards and Hazardous Waste: There is unlikely to be permanent exposure to hazards or hazardous waste.

Hydrology and Water Quality: There is unlikely to be permanent degradation of the local hydrology and water quality.

TEMPORARY and CONSTRUCTION IMPACTS: Temporary impacts during construction are expected in the following areas:

Biological impacts: Incidental take of listed fish (coho salmon) could occur from exposure to turbidity and noise impacts during construction and demolition of the bridges. Construction and demolition methods that would minimize these impacts are being considered.

Community Impacts: Construction of the bridge over three to four construction seasons is expected to impact commuters. Ingress and egress at Lake Earl Drive, Route 197 and Fred D. Haight Drive would be provided throughout the duration of construction.

Recreation: Recreational fishing could be affected when the season overlaps with construction season.

Water Quality: Three to four years of construction would have temporary construction related impacts to the Smith Rivers water quality. Best management practices would be in place to ensure that these impacts are minimized.

CEQA Environmental Checklist

01-DN-101	35.8/36.5 P.M	E.A. 436400

This 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 projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐
II. 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 Dept. 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 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. 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?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, 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))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
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?	☐	☐	☒	☐

III. 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. Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

IV. BIOLOGICAL RESOURCES: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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 Game or U.S. Fish and Wildlife Service?	☒		☐	☐
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 Game or US Fish and Wildlife Service?	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
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?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
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?	☐	☐	☐	☒

V. CULTURAL RESOURCES: Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

VI. GEOLOGY AND SOILS: Would the project:

a) Expose people or structures to 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?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

VII. GREENHOUSE GAS EMISSIONS: Would the project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.

VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
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?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
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?	☐	☐	☒	☐
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 for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

IX. HYDROLOGY AND WATER QUALITY: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) 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?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

X. LAND USE AND PLANNING: Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

XI. MINERAL RESOURCES: 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?	☐	☐	☐	☒
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?	☐	☐	☐	☒

XII. NOISE: Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without 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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

XIII. POPULATION AND HOUSING: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial 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)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

XIV. PUBLIC SERVICES:

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:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☒	☐

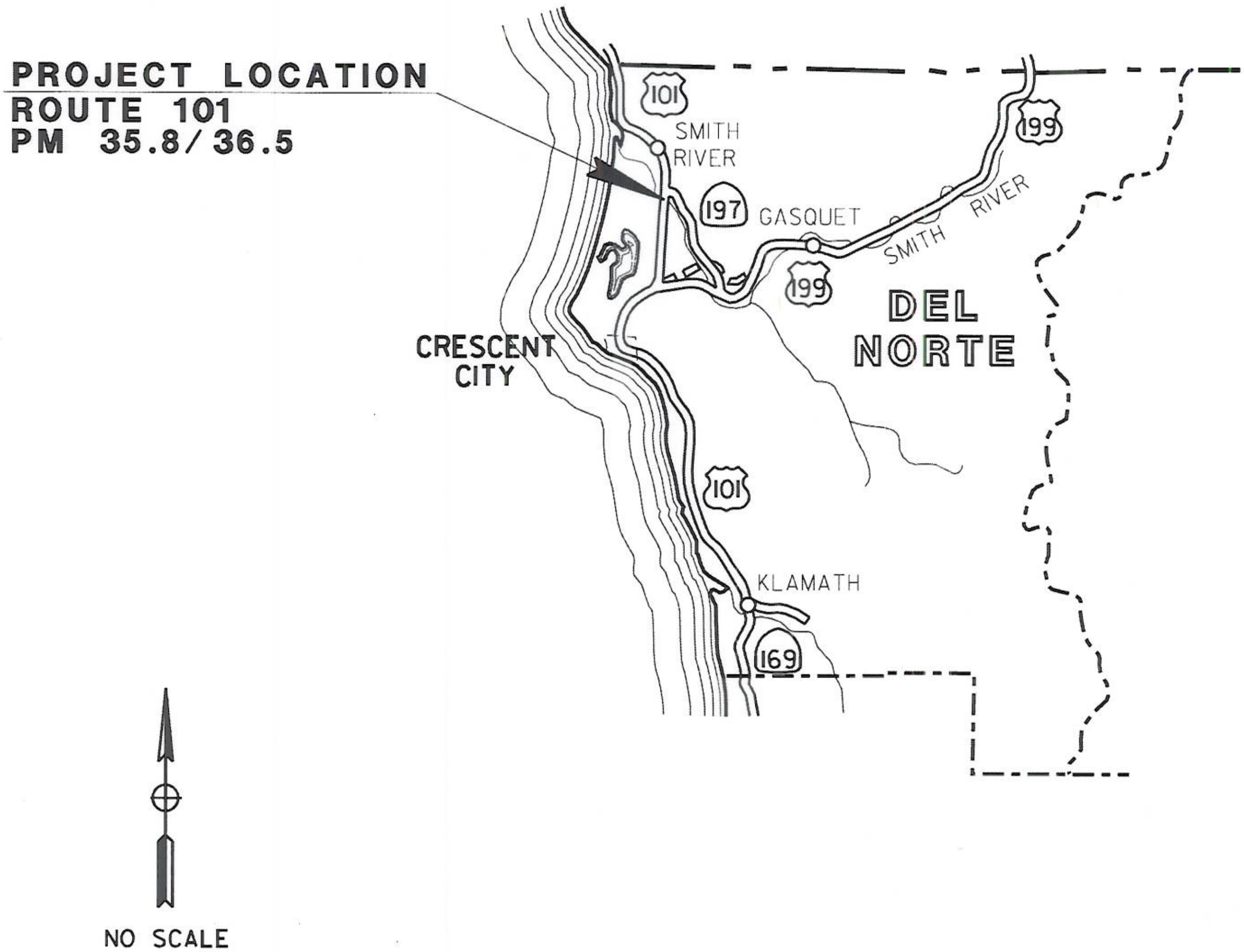
	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XV. RECREATION:				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
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?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC: Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) 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?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Does the project have the potential to 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?	☒	☐	☐	☐
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)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

ATTACHMENT A



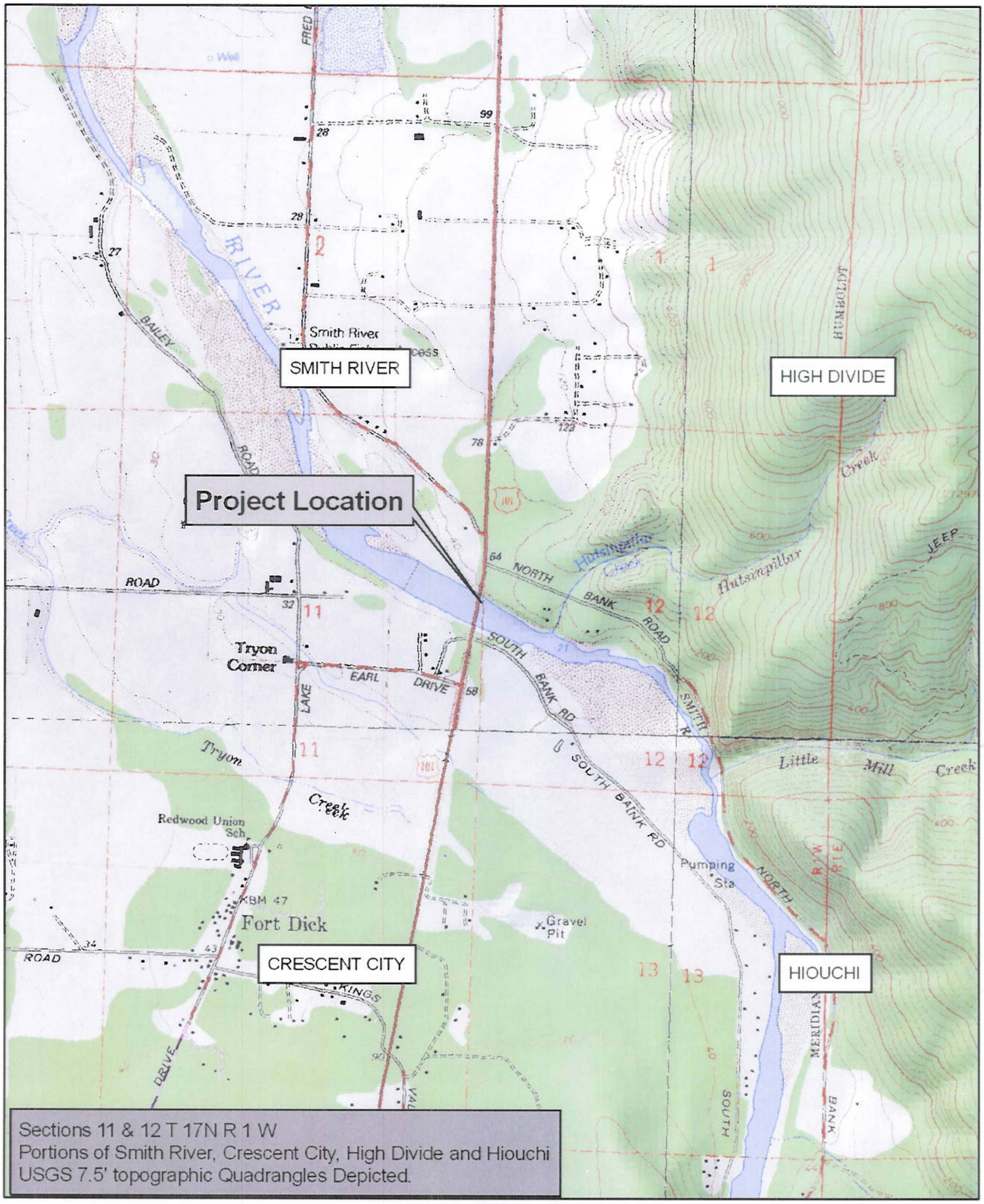
LOCATION MAP

01-DN-101 PM 35.8/36.5

EA: 01-436401

SMITH RIVER BRIDGE REPLACEMENT

Dr. Fine Bridge Replacement Project
1-DN-101 PM 35.8/36.5



Appendix E National Park Service Letter

United States Department of the Interior
NATIONAL PARK SERVICE
Pacific West Region
1111 Jackson Street
Oakland, CA 94607

April 15, 2013

Steve Croteau, Associate Environmental Planner
California Department of Transportation

Re: Dr. Fine Bridge replacement

Dear Mr. Croteau:

The National Park Service has received and reviewed all the documents provided regarding the Dr. Fine Bridge replacement.

Section 7 of the Wild and Scenic Rivers Act prohibits federal agencies from "assist[ing] by loan grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established." The National Park Service considers water resources projects to include projects involving construction in the bed or on the banks of the river; therefore this project requires a Section 7 determination.

The National Park Service does not believe that this project will have a long-term, significant impact on the Smith River's designation or its Outstandingly Remarkable Values (ORVs) since the Cal Trans is proposing a new bridge using best management practices that will ultimately be more beneficial to the river's designation than the existing bridge. However, if at any point the project scope should change you are required to notify the National Park Service.

If you have any further questions, please contact me at (510) 817-1451.

Sincerely,

Stephen Bowes

Hydropower Assistance Program
National Park Service
1111 Jackson Street, Suite 700
Oakland, CA 94607
Office: 510-817-1451
Fax: 510-817-1505

Appendix F USFWS and NMFS Species List

United States Department of the Interior

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

In Reply Refer To: September 18, 2019
Consultation Code: 08EACT00-2019-SLI-0517
Event Code: 08EACT00-2019-E-01232
Project Name: Dr. Fine Bridge Replacement

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-0517

Event Code: 08EACT00-2019-E-01232

Project Name: Dr. Fine Bridge Replacement

Project Type: BRIDGE CONSTRUCTION / MAINTENANCE

Project Description: Caltrans proposes to replace Dr. Fine Bridge over Smith River in Del Norte County

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.880057938051706N124.13719867811378W

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 Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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

Mammals

NAME	STATUS
Fisher *Pekania pennanti* 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 *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **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 *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Oregon Silverspot Butterfly *Speyeria zerene hippolyta* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6930	Threatened

Flowering Plants

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

Critical habitats

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

Quad Name **Smith River**
Quad Number **41124-H2**

ESA Anadromous Fish

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

ESA Anadromous Fish Critical Habitat

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

ESA Marine Invertebrates

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

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

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

ESA Whales

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

ESA Pinnipeds

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

Essential Fish Habitat

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

MMPA Species (See list at left)

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

MMPA Cetaceans - **X**

MMPA Pinnipeds - **X**

Quad Name **High Divide**
Quad Number **41124-H1**

ESA Anadromous Fish

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

ESA Anadromous Fish Critical Habitat

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

ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

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

ESA Whales

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

ESA Pinnipeds

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

Essential Fish Habitat

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

MMPA Species (See list at left)

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

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Hiouchi**
Quad Number **41124-G1**

ESA Anadromous Fish

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

ESA Anadromous Fish Critical Habitat

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

ESA Marine Invertebrates

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

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

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

ESA Whales

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

ESA Pinnipeds

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

Essential Fish Habitat

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

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds

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

MMPA Cetaceans -
MMPA Pinnipeds -

uad Name	**Crescent City**
Quad Number	**41124-G2**

ESA Anadromous Fish

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

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -	**X**
CCC Coho Critical Habitat -	
CC Chinook Salmon Critical Habitat -	
CVSR Chinook Salmon Critical Habitat -	
SRWR Chinook Salmon Critical Habitat -	
NC Steelhead Critical Habitat -	
CCC Steelhead Critical Habitat -	
SCCC Steelhead Critical Habitat -	
SC Steelhead Critical Habitat -	
CCV Steelhead Critical Habitat -	
Eulachon Critical Habitat -	

sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

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

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

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

ESA Whales

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

ESA Pinnipeds

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

Essential Fish Habitat

Coho EFH - **X**
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH - **X**

Highly Migratory Species EFH -

<u>MMPA Species (See list at left)</u>

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

MMPA Cetaceans - **X**

MMPA Pinnipeds - **X**

Appendix G Dominie Creek Fish Passage Project

CATEGORICAL EXEMPTION/CATEGORICAL EXCLUSION DETERMINATION FORM

01-DN-101	39.78	01-0F310	01 1500 0108
District-County-Route	P.M./P.M.	E.A/Project No.	Federal-Aid Project Number

PROJECT DESCRIPTION: (Briefly describe project including need, purpose, location, limits, and right-of-way requirements.)

The proposed project is located on State Route 101 in Del Norte County at PM 39.78. The purpose of the project is to improve fish passage on Dominie Creek at the SR 101 culvert crossing. Work associated with the project will include replacing the existing box culvert with a new bridge structure, reconstructing the stream channel bed and banks, and widening the roadway approaches to accommodate the new bridge structure. The existing 10-foot by 7-foot reinforced concrete box culvert that conveys Dominie Creek under SR 101 will be replaced with a single span precast box girder structure approximately 80 feet in length with two 12-foot travel lanes and 8-foot shoulders. Half width construction (staged construction sequence) will be used for construction. Stream channel restoration will occur approximately 200-feet upstream and 100-feet downstream of the new bridge and will include placement of RSP and engineered substrate material along the channel bottom and on the banks. Staging will utilize paved shoulders and developed gravel turnouts. All work will occur within the State right of way. Biological, cultural, air, noise, visual, water quality, and hazardous materials studies have been completed. **See next page for additional project information.**

CALTRANS CEQA DETERMINATION (Check one)

☐ **Not Applicable – Caltrans is not the CEQA Lead Agency** ☐ **Not Applicable – Caltrans has prepared an Initial Study or Environmental Impact Report under CEQA**

Based on an examination of this proposal, supporting information, and the above statements, the project is:

☐ **Exempt by Statute.** (PRC 21080[b]; 14 CCR 15260 et seq.)

☒ **Categorically Exempt. Class 33.** (PRC 21084; 14 CCR 15300 et seq.)

Based on an examination of this proposal and supporting information, the following statements are true and exceptions do not apply:

- If this project falls within exempt class 3, 4, 5, 6 or 11, it does not impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law.
- There will not be a significant cumulative effect by this project and successive projects of the same type in the same place, over time.
- There is not a reasonable possibility that the project will have a significant effect on the environment due to unusual circumstances.
- This project does not damage a scenic resource within an officially designated state scenic highway.
- This project is not located on a site included on any list compiled pursuant to Govt. Code § 65962.5 ("Cortese List").
- This project does not cause a substantial adverse change in the significance of a historical resource.

☐ **Exempt by General Rule.** [This project does not fall within an exempt class, but it can be seen with certainty that there is no possibility that the activity may have a significant effect on the environment (14 CCR 15061[b][3].)

Dana York		**Jaime Matteoli**	
Environmental Branch Chief		Project Manager	
[signature]	1-15-19	[signature]	1/14/19
Signature	Date	Signature	Date

NEPA COMPLIANCE

In accordance with 23 CFR 771.117, and based on an examination of this proposal and supporting information, the State has determined that this project:

- does not individually or cumulatively have a significant impact on the environment as defined by NEPA, and is excluded from the requirements to prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS), and
- has considered unusual circumstances pursuant to 23 CFR 771.117(b).

CALTRANS NEPA DETERMINATION (Check one)

☒ **23 USC 326:** The State has determined that this project has no significant impacts on the environment as defined by NEPA, and that there are no unusual circumstances as described in 23 CFR 771.117(b). As such, the project is categorically excluded from the requirements to prepare an EA or EIS under the National Environmental Policy Act. The State has been assigned, and hereby certifies that it has carried out the responsibility to make this determination pursuant to Chapter 3 of Title 23, United States Code, Section 326 and a Memorandum of Understanding dated May 31, 2016, executed between the FHWA and the State. The State has determined that the project is a Categorical Exclusion under:

☐ **23 CFR 771.117(c): activity (c)(___)**

☐ **23 CFR 771.117(d): activity (d)(___)**

☒ **Activity 3 listed in Appendix A of the MOU between FHWA and the State**

☐ **23 USC 327:** Based on an examination of this proposal and supporting information, the State has determined that the project is a Categorical Exclusion under 23 USC 327. 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 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Dana York		**Jaime Matteoli**	
Environmental Branch Chief		Project Manager	
[signature]	1-15-19	[signature]	1/14/19
Signature	Date	Signature	Date

Date of Categorical Exclusion Checklist completion: 1/14/19 Date of ECR or equivalent: 1/14/19

CATEGORICAL EXEMPTION/CATEGORICAL EXCLUSION DETERMINATION FORM
Continuation Sheet

01-DN-101	39.78	01-0F310	01 1500 0108
District-County-Route	P.M./P.M.	E.A/Project No.	Federal-Aid Project Number

Continued from page 1:

As a result of the technical studies completed, the following measures have been included as part of the project:

- Tribal monitoring for all ground disturbance activities will be required. Tribal monitors are needed due to the location of the project adjacent to tribal owned lands, as well as the historic location of the reservation.
- Context sensitive solutions for the bridge aesthetic treatment (the aesthetic treatment developed by THPO Amanda O'Connell is being approved by Tribal Council).
- Use SSP 7-1.02K(6)(j)(iii) Earth Material Containing Lead. A Lead Compliance Plan (LCP) contract item is also required.
- A Water Pollution Control Plan (WPCP) is required and Caltrans Construction Site BMPs will be incorporated in to the WPCP.
- In compliance with the Migratory Bird Treaty Act, vegetation clearing would be limited to September 15th to January 31st. If vegetation removal is required during the breeding season, a nesting bird survey would be conducted within one week of disturbance by a qualified biologist.
- In-stream work will be restricted to the period between June 15th and October 15th.
- The contractor would be required to include an Aquatic Species Relocation Plan (as part of the Construction Site Dewatering and Diversion Plan) submitted to Caltrans for approval prior to any dewatering or diversion of the creek.
- A qualified biologist would monitor all in-stream construction activities, including dewatering activities to ensure adherence to all environmental permit conditions and avoidance and minimization measures during construction.
- The Terms and Conditions in the Biological Opinion from National Marine Fisheries Service (NMFS), received on 10/22/2018, will be implemented.

PERMITS REQUIRED:

Clean Water Act Section 404 from United States Army Corps of Engineers, 401 Certification from North Coast Regional Water Quality Control Board, and Section 1602 Streambed Alteration Agreement and Section 2080.1 Consistency Determination from California Department of Fish and Wildlife.

SECTION 7 CONSULTATIONS:

A Biological Assessment was submitted to NMFS on August 28, 2018. A Biological Opinion was received from NFMS on October 22, 2018.

Biological Assessment

For SONCC Coho Salmon (*Oncorhynchus kisutch*),
Designated Critical Habitat of SONCC Coho Salmon
and

Essential Fish Habitat Assessment

For Pacific Coast Salmon

Dominie Creek Fish Passage Project

DN-101-39.78
EA #01-0F3100 / E-FIS #115000108

August 2018

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

For individuals with sensory disabilities, this document is available in Braille, large print, on audiocassette, or computer disk. To obtain a copy in one of these alternate formats, please call or write to Department of Transportation, Attn: Karen Radford, Environmental Planning, 1656 Union Street, Eureka, CA 95501; (707) 445-6583 (Voice), or use the California Relay Service 1 (800) 735-2929 (TTY), 1 (800) 735-2929 (Voice) or 711.

Biological Assessment

For SONCC Coho Salmon (*Oncorhynchus kisutch*),
Designated Critical Habitat of SONCC Coho Salmon
and

Essential Fish Habitat Assessment

For Pacific Coast Salmon

Dominie Creek Fish Passage Project

DN-101-39.78
EA #01-0F3100 / E-FIS #115000108

August 2018

STATE OF CALIFORNIA
Department of Transportation

Prepared by: ____________________ Date: 8/24/2018
MANNA WARBURTON, Senior Biologist
619-940-5005
ICF
Arcata, CA

Recommended For Approval by: ____________________ Date: 8/27/2018
for LISA EMBREE, Associate Environmental Planner, N.S.
707-441-5722
North Region Environmental Services
Caltrans District 1, Eureka

Approved by: ____________________ Date: 8/27/2018
JENNIFER BARBOUR, Acting District Environmental Branch Chief, E-3
707-445-6692
North Region Environmental Services Branch E-3
Caltrans District 1, Eureka

Summary of Findings and Determinations

The California Department of Transportation (Caltrans) proposes to implement a fish passage improvement project on Dominie Creek to address California Endangered Species Act mitigation requirements for incidental take of juvenile coho salmon associated with the Dr. Fine Bridge Project. The mitigation project would address a high-priority stream crossing identified for fish passage remediation in Caltrans District 1 (Lang 2005) by removing a known impediment to coho salmon, Chinook salmon, and steelhead trout migration (i.e., replacing a concrete box culvert with a full span bridge) and improving access to an estimated 8,400 feet (1.6 miles) of habitat above U.S. Route (US) 101. The US 101 culvert at Dominie Creek is listed as a high-priority barrier in the Southern Oregon/Northern California Coast (SONCC) coho salmon recovery plan, and Dominie Creek is listed as a tributary with a high intrinsic potential to support coho salmon.

The proposed action *may affect and is likely to adversely affect* SONCC coho salmon and SONCC coho salmon critical habitat. Potential effects include: 1) temporary effects on individuals and reductions in water quality from construction-related increases in turbidity, suspended sediment, and contaminant exposure risk, 2) temporary effects on individuals and habitat quality from general construction noise and visual disturbance, 3) temporary effects on individuals and habitat quality from demolition noise, 4) effects on individuals and habitat quantity and quality from installation of the clear water diversion, 5) temporary reductions in riparian vegetation and 6) permanent changes in physical and hydraulic conditions from stream channel and bank stabilization.

Potential effects on the physical and biological features (primary constituent elements) of the SONCC coho salmon critical habitat include: 1) temporary effects on water quality from construction-related increases in turbidity, suspended sediment, and contaminant exposure risk, 2) temporary effects on habitat quality (space) from general construction noise and visual disturbance, 3) temporary effects on habitat quality (space) from demolition noise, 4) temporary effects on habitat quantity and quality (space, water velocity, food, and passage conditions) from installation of the clear water diversion, 5) temporary reductions in riparian vegetation (riparian vegetation, food, cover/shelter, water temperature) and 6) permanent changes in physical and hydraulic conditions from stream channel and bank stabilization (water velocity, substrate, passage conditions).

The proposed action *may adversely affect* essential fish habitat (EFH) for Pacific Coast Salmon (coho salmon and Chinook salmon) as designated under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Effects of the proposed action on Pacific Coast Salmon EFH would be similar to the effects of the action on SONCC coho salmon critical habitat.

Potential adverse effects of increased turbidity, suspended sediment, and contaminant exposure on coho salmon and their critical habitat would be avoided or minimized through implementation of standard erosion and sediment control best management practices (BMPs) and permanent design measures (roughened channel and streambank protection) to protect water quality. With restrictions of in-channel work activities to June 15–October 15, and implementation of standard erosion and sediment control measures, pollution prevention measures, and stormwater treatment measures, potential environmental effects would be limited to temporary, localized increases in turbidity and suspended sediment during in-channel construction activities. Potential effects on fish would likely be limited to temporary displacement (i.e., avoidance behavior) and redistribution of juveniles immediately downstream of work areas in response to brief periods of elevated turbidity and suspended sediment associated with channel-disturbing activities (e.g., placement and removal of cofferdam). Caltrans anticipates that small numbers of juvenile coho salmon may be displaced from preferred habitat, and experience brief disruptions in normal activities (e.g., feeding) in response to elevated turbidity and suspended sediment. However, these effects would be temporary and unlikely to affect survival or growth because of the localized, temporary nature of disturbance and availability of suitable habitat outside the affected areas.

Similarly, other construction disturbances such as noise (non-impulsive, continuous sources of noise below injury thresholds) and visual disturbances from operation of equipment in or near the channel are expected to have only temporary effects on behavior of fish. Nighttime lighting may create conditions that increase the vulnerability of juvenile salmonids to predators such as piscivorous fish and birds. To minimize potential adverse effects associated with these disturbances, Caltrans proposes to restrict in-channel construction activities to June 15–October 15 to avoid the peak adult and juvenile migration periods of coho salmon and restrict the use of artificial light to active construction areas only.

Demolition activities have the potential to generate noise levels sufficient in intensity and duration to cause direct injury to fish. However, implementation of the clear water diversion and the removal and relocation of fish from the temporary bypass reach (prior to dewatering and demolition activities) would eliminate the risk of direct injury from exposure to demolition noise. The effects on fish would be limited to potential behavioral effects that could extend beyond the upstream and downstream limits of the clear water diversion. This could result in temporary displacement of juveniles from preferred habitat and brief disruptions in normal activities (e.g., feeding). However, these effects are not expected to adversely affect survival and growth because of the localized, temporary nature of the disturbance and the availability of suitable habitat outside the affected areas.

Juvenile coho salmon could be injured or killed during installation of the clear water diversion, subsequent dewatering, and fish rescue and relocation activities. Restricting these activities to June 15–October 15 would avoid the most sensitive life stages and peak adult and juvenile migration periods. However, juvenile coho may be present during the summer rearing period. The potential for harm is highest during dewatering operations when juveniles may become isolated and unable to return to the active stream. To minimize potential injury or mortality, Caltrans would implement fish capture, relocation, and/or exclusion measures in accordance with an Aquatic Species Relocation Plan. While fish relocation can be an effective protective measure, some amount of unintentional injury or mortality attributable to fish capture and handling is expected depending on the method used, stream conditions, and expertise and experience of the field crew. However, based on the results of fish relocation efforts from other clear water diversion activities and adherence to the procedures described in the Aquatic Species Relocation Plan, no more than three percent of all relocated fish would be subject to potential injury or mortality.

The presence of the clear water diversion would preclude upstream fish migration. However, the potential for blockage of adults attempting to migrate upstream would be minimized by restricting the clear water diversion to June 15-October 15. Although downstream passage for juvenile coho and other salmonids would be maintained, the altered physical and hydraulic conditions associated with the diversion may increase the vulnerability of juveniles to predators. The use of artificial nighttime lighting could compound this risk. However, given the measures to limit the use of lights to active construction areas (thus avoiding illuminating the inlet and outlet areas of the clear water diversion), the risk of predation is considered negligible.

The proposed action would result in temporary impacts on riparian and in-channel habitat from the removal of riparian vegetation, dewatering of the stream channel, and stabilization of the stream channel and banks. Clearing of vegetation to permit access to the creek would result in the temporary loss of approximately 0.6 acre of existing riparian vegetation within the footprint of the reconstructed channel and banks. Caltrans proposes to mitigate onsite for temporary impacts on riparian vegetation by implementing a mitigation monitoring plan. The objective of this plan would be to restore onsite riparian habitat at a minimum ratio of 1:1 subject to the final permitting requirements and coordination with the resource agencies to ensure no-net loss of riparian function. During construction, the contractor would be required to implement all applicable BMPs to stabilize disturbed soil areas, and, upon completion of construction, restore all riparian areas temporarily affected by construction to pre-existing conditions. In addition to the standard BMPs, the plan would include measures to avoid native riparian trees and shrubs (especially those providing shade and bank stabilization) to the extent possible and implement a bioengineered streambank protection design that includes the incorporation of soil and plantings of native trees and shrubs within rock slope protection. Although the loss of riparian habitat would result in localized reductions in habitat quality within the project footprint, these losses would be temporary and not likely to have significant, long-term effects on SONCC coho salmon critical habitat or Pacific Coast Salmon EFH.

Temporary losses of aquatic habitat would occur for up to two consecutive seasons due to installation of the clear water diversion. Impacts include temporary losses of summer rearing habitat due to loss of physical habitat (space), substrate, and prey availability (macroinvertebrate production). The majority of these impacts are due to the footprint of the temporary diversion, which would dewater approximately 0.12 acre of stream habitat during the in-channel construction period (June 15–October 15). Following each construction season, the temporary clear water diversion would be removed and the flow restored to the dewatered area. Although temporary losses of aquatic habitat would occur during construction, the scale of these losses would be minor compared to the total amount of rearing habitat in Dominie Creek, and the long-term increases in habitat that would be made available following construction.

Although physical and hydraulic conditions within the footprint of the new channel would be permanently modified, the proposed channel (roughened channel) would be designed to function similarly to a natural channel and provide broad range of substrate sizes and hydraulic conditions over a wide range of flows to restore upstream and downstream passage conditions for adult and juvenile coho salmon and other salmonids. Consequently, these modifications would result in long-term beneficial effects on SONCC coho salmon critical habitat and Pacific Coast Salmon EFH by improving fish passage and restoring access to 1.6 miles of spawning and rearing habitat upstream of the project site.

Table of Contents

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Abbreviated Terms

BA	Biological Assessment
BMP	best management practices
BO	Biological Opinion
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CGP	Construction General Permit
CIP	cast-in-place
CWA	Clean Water Act
dB	decibels
DO	dissolved oxygen
DPS	Distinct Population Segment
EFH	essential fish habitat
EFHA	Essential Fish Habitat Assessment
ESA	Federal Endangered Species Act
ESU	Evolutionarily Significant Unit
°F	degrees Fahrenheit
FHWA	Federal Highway Administration
FMP	fishery management plan
FR	Federal Register
HAPC	Habitat Areas of Particular Concern
HMA	hot mix asphalt
HU	Hydrologic Unit
LWD	large woody debris
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NCRWQCB	North Coast Regional Water Quality Control Board
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System

OHWM	ordinary high water mark
PM	post mile
RECP	rolled erosion control products
RMS	root mean square
SEL	sound exposure level
SONCC	Southern Oregon/Northern California Coast
SPL	sound pressure level
SWPPP	stormwater pollution prevention plan
TMDL	Total Maximum Daily Load
U.S.C.	United States Code
US	United States (U.S.) Route
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
YOY	young-of-year (age 0 fish)

Chapter 1. Introduction

This Biological Assessment (BA) and Essential Fish Habitat Assessment (EFHA) has been prepared in accordance with legal requirements set forth under regulations implementing Section 7 (a)(2) of the Federal Endangered Species Act (ESA) (50 Code of Federal Regulations [CFR] 401; 16 United States Code [U.S.C.] 1536(c)), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), and with Federal Highway Administration (FHWA) and California Department of Transportation (Caltrans) regulation, policy, and guidance. The BA is presented first in this joint document, followed by the EFHA in Chapter 8, *Essential Fish Habitat Assessment*.

The purpose of the BA is to provide technical information and to review the actions or activities proposed for the Dominie Creek Fish Passage Project (proposed action) in sufficient detail to determine the extent to which the proposed action may affect threatened, endangered, or proposed species. The purpose of the EFHA is to evaluate the potential effects of the proposed action on habitat essential for sustainable production of commercially important fish species. Federally listed species consist of all fish determined by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to be endangered, threatened, or proposed for endangered or threatened status under the auspices of the ESA. Essential fish habitat (EFH) for federally managed commercial fisheries is defined in respective federal fishery management plans (FMP) (Pacific Fishery Management Council 2016). Implementation of both the ESA for federally listed anadromous fish species and the EFH provisions of the MSA are administered by NMFS.

1.1. Purpose and Need of the Proposed Action

Caltrans proposes to implement a fish passage improvement project on Dominie Creek (post mile 39.78), to address California Endangered Species Act (CESA) mitigation requirements for incidental take of juvenile coho salmon associated with the Dr. Fine Bridge Project. The project on Dominie Creek would address a high-priority stream crossing identified for fish passage remediation in Caltrans District 1 (Lang 2005) by removing a known impediment to coho salmon, Chinook salmon, and steelhead trout migration (i.e., replacing a concrete box culvert with a full span bridge) and improving access to an estimated 8,400 feet (1.6 miles) of habitat above U.S. Route (US) 101. The US 101 culvert at Dominie Creek is listed as a high priority barrier in the

Southern Oregon/Northern California Coast (SONCC) coho recovery plan, and Dominie Creek is listed as a tributary with a high intrinsic potential[1] to support coho salmon.

The project is needed because the current conditions at the box culvert create a barrier for fish passage. A Caltrans fish passage assessment study (Lang 2005) concluded that vertical leaps at the outlet weir and culvert outlet need to be reduced to improve passage, and that the culvert does not have sufficient water depth to pass fish over almost 50% of the passage flows. The assessment also recommended improving the outlet conditions to backwater the culvert. Currently, the outlet apron has exposed rebar and the downstream weir is damaged.

1.1.1. Project Location

The proposed action area is located within the Smith River Hydrologic Unit (HU) on and adjacent to US 101 between post mile (PM) 39.7 and PM 39.8, approximately 14 miles north of Crescent City in Del Norte County, California (Figure 1-1). Figure 1-2 shows the project area boundary and surrounding area. The total length of the proposed action is approximately 510 feet. The proposed action is in the U.S. Geological Survey 7.5-minute Smith River quadrangle in Sections 23 and 26, Township 18 North, Range 1 West, Humboldt Base and Meridian. Geographical coordinates (WGS84) at the center of the project area are 41.88° North, -124.14° West. The culvert crossing on Dominie Creek is located approximately 650 feet upstream of the Rowdy Creek Fish Hatchery that is located at the confluence of Dominie and Rowdy Creek. A fish passage improvement project at the Rowdy Creek Fish Hatchery (currently design has been completed, project funding is needed) is expected to improve fish passage in both Dominie Creek and Rowdy Creek (GHD and Michael Love & Associates 2015).

[1] Intrinsic potential is a prediction of the potential for a stream reach to exhibit habitat characteristics suitable for rearing juvenile coho salmon, as a function of the underlying geomorphic and hydrologic characteristics of the landscape (Williams et al. 2006).

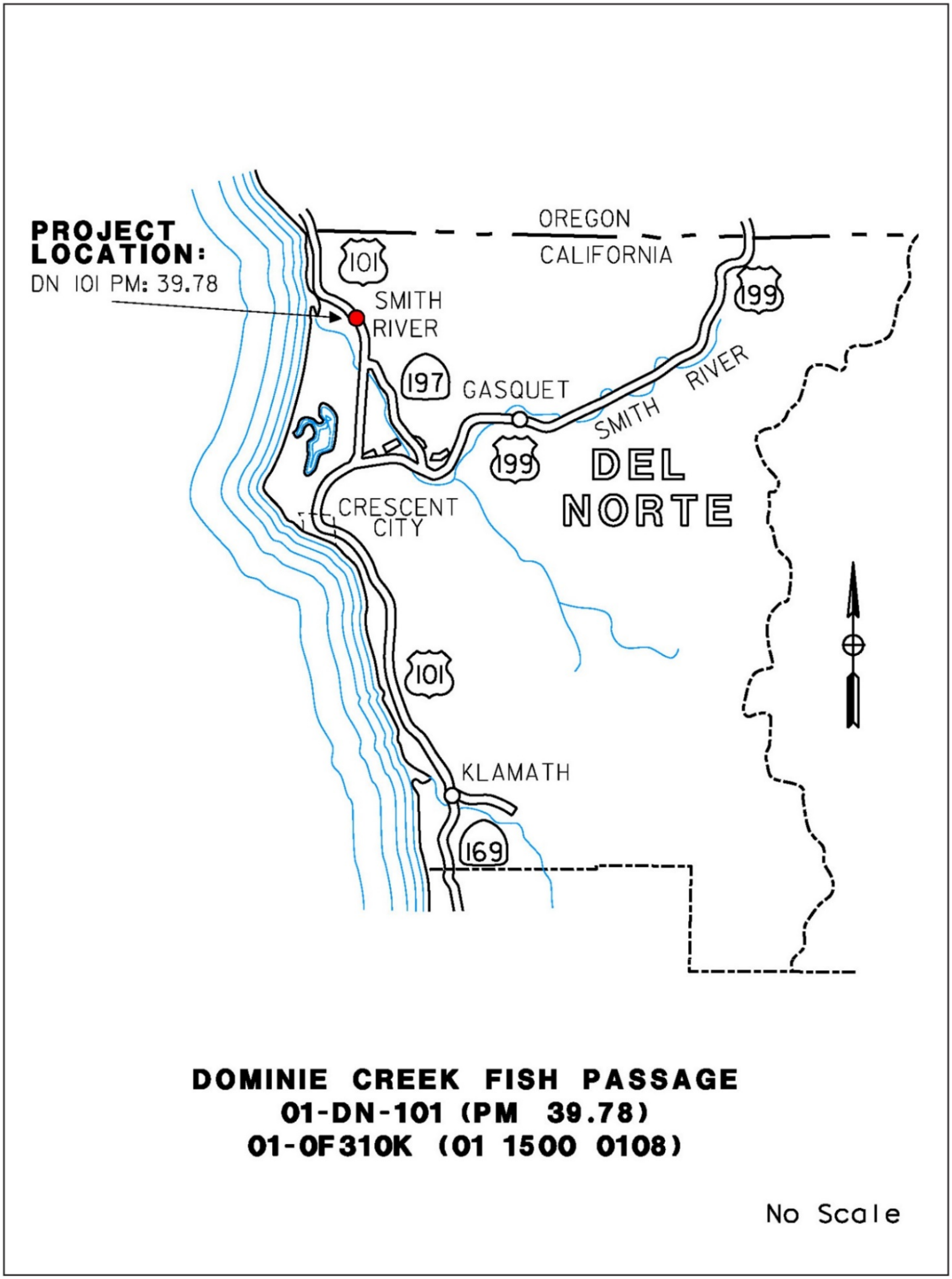

Figure 1-1 Project Vicinity

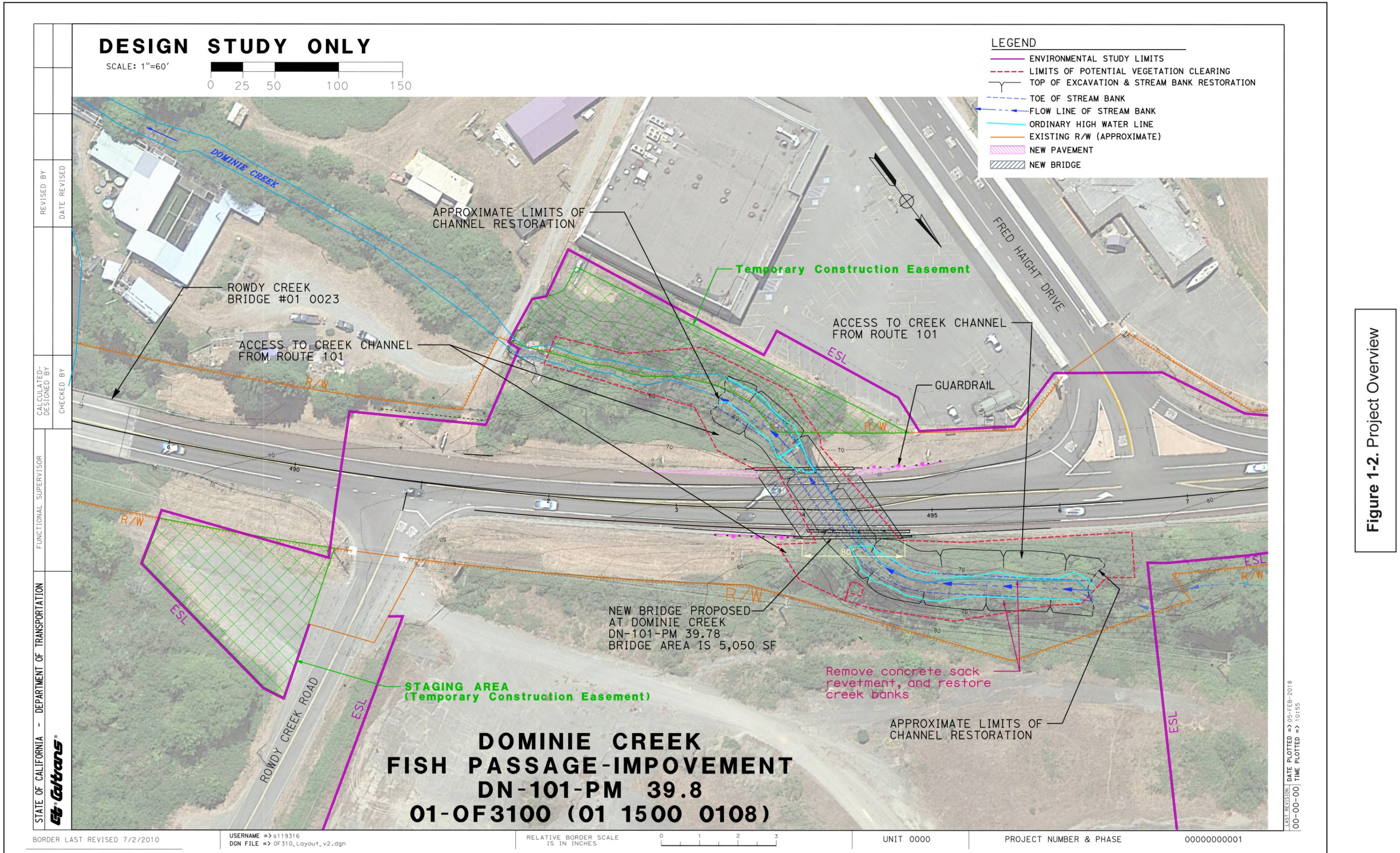

Figure 1-2. Project Overview

1.2. Project History and Summary of Proposed Action

The existing box culvert was originally built in 1950, and is 70 feet long and 10 feet wide. The roadway consists of two 12-foot lanes, 3-foot shoulders, and a metal beam guard rail. The existing culvert consists of a single-span cast-in-place (CIP)/reinforced concrete structure with an asphalt deck. The culvert conveys Dominie Creek under US 101 at an angle of approximately 35 degrees left. The inlet has a warped wingwall on the left and a 90-degree wingwall on the right. The banks upstream of the culvert inlet are stabilized with sack concrete and the outlet is a concrete apron with a notched weir and flared wingwalls.

The replacement bridge is proposed to be an approximately 80-foot-long single-span precast box girder unit type structure. The abutments would likely consist of driven 16-inch-diameter steel pipe or reinforced concrete piles. The height of the bridge over the stream channel would be approximately 16 feet. The deck would be precast and approximately 2.75 feet thick. The new bridge would follow the same alignment as the existing culvert and would feature two 12-foot lanes with 8-foot shoulders, bridge railing, and metal beam guard rail.

1.3. Species and Habitats Addressed

This BA addresses the Federal ESA–listed threatened SONCC Evolutionarily Significant Unit (ESU) of coho salmon (*Oncorhynchus kisutch*) and designated critical habitat for SONCC coho salmon (Table 1-1). EFH for Pacific Coast Salmon (coho salmon and Chinook salmon), managed under the Pacific Coast Salmon FMP, is also present within the action area. The action area is upstream of the head of tide water and therefore does not contain EFH for Pacific Coast Groundfish or Coastal Pelagic Fish. Caltrans expects no impacts on EFH for marine species that may use the Smith River estuary.

NMFS provided Caltrans a list of federally threatened fish species, designated critical habitat, and EFH that may be within the vicinity of, or affected by, the proposed action. Through technical assistance with NMFS and review of available literature and records of species occurrence in the Smith River, it was determined that the federally listed SONCC ESU of coho salmon have the potential to occur within the action area. The designated critical habitat for SONCC coho salmon includes the action area (64 Federal Register [FR] 24059 and 76 FR 65324). The list of federally listed fish species provided by NMFS also included the southern Distinct Population Segment (DPS) of eulachon (*Thaleichthys pacificus*) and southern DPS of North American green sturgeon (*Acipenser medirostris*). However, these species are not likely to occur in the action area based on their distribution, life history, and habitat requirements. Caltrans anticipates no effect to these species from the proposed action.

Table 1-1. Federally Listed Fish Species, Designated Critical Habitat, and Essential Fish Habitat within the Action Area

SPECIES	ESA LISTING	ESA CRITICAL HABITAT	EFH
Coho salmon (*Oncorhynchus kisutch*): SONCC ESU	Threatened 70 FR 37160 June 28, 2005	Designated 64 FR 24049 May 5, 1999	Pacific Coast Salmon FMP
Chinook salmon (*Oncorhynchus tshawytscha*): SONCC ESU	N/A	N/A	Pacific Coast Salmon FMP

ESA = Endangered Species Act
SONCC = Southern Oregon/Northern California Coast
ESU = Evolutionarily Significant Unit
FR = Federal Register
N/A = not applicable
FMP = fishery management plan

1.4. Studies Conducted for the Project

In order to comply with the provisions of various state and federal environmental statutes and executive orders, potential impacts on natural resources of the action area were investigated and documented. Field reviews were conducted to identify existing habitat types and natural communities, jurisdictional waters and wetlands, rare species and/or factors indicating the potential for rare species (i.e., presence of suitable habitat), sensitive water quality receptors, and existing ambient noise levels.

Caltrans prepared a hydroacoustic assessment to aid biologists in assessing noise impacts on protected fish species associated with demolition activities (California Department of Transportation 2018a). This assessment identified estimated linear distances from the transmission site where noise thresholds for injury and behavioral effects to fish are attained as described in interim guidelines developed by the Fisheries Hydroacoustic Working Group (2008)[2].

Caltrans also prepared a draft hydraulic report documenting the results of hydraulic modeling and analysis of the scour potential and sediment and debris transport capacity of the proposed bridge and reconstructed channel based on estimated 50-year and 100-year peak flow events (California Department of Transportation 2018b).

[2] The Fisheries Hydroacoustic Working Group consists of key technical and policy staff from the FHWA, NMFS, USFWS, the Departments of Transportation from California, Oregon, and Washington, and other national experts on sound propagation activities that affect fish and wildlife species.

A Water Quality Assessment Memo (California Department of Transportation 2018c) was prepared for the project to fulfill the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and to provide information for National Pollutant Discharge Elimination System (NPDES) and Construction General Permit (CGP) permitting. This report discusses potential water quality impacts associated with construction and operation of the proposed action, and recommends avoidance and minimization measures for potentially adverse impacts on water quality. The report also identifies temporary and permanent stormwater best management practices (BMPs) that would be implemented to treat stormwater runoff both during construction and post-construction.

Chapter 2. Consultation History

Caltrans coordinated with agency personnel from NMFS, USFWS, and the California Department of Fish and Wildlife (CDFW). A summary of these coordination efforts and professional contacts is summarized in this chapter.

August 7, 2015 – Field review with NMFS (Rebecca Bernard) and CDFW for project overview.

August 20, 2015 – Level 1 meeting including NMFS (Rebecca Bernard) and CDFW (Rich Lis).

September 24, 2015 – Level 1 meeting including NMFS (Rebecca Bernard) and CDFW (Rich Lis).

October 16, 2015 – Field review with NMFS (Rebecca Bernard) and CDFW (Justin Garwood) to discuss potential mitigation.

January 24, 2016 – Meeting with NMFS (Rebecca Bernard) and CDFW (Michael van Hattem) for project overview and status.

April 2017 – Meeting with NMFS regarding ESA Section 7 consultation.

Chapter 3. Description of Proposed Action

3.1. Project Summary

The proposed action would replace the Dominie Creek concrete box culvert with a single-span bridge and restore fish passage to Dominie Creek above the US 101 crossing. The box culvert was originally built in 1950, and is 70 feet long and 10 feet wide, with two 12-foot lanes, 3-foot shoulders, and a metal beam guard rail. The existing culvert consists of a single-span CIP/reinforced concrete structure with an asphalt deck. The culvert conveys Dominie Creek under US 101 on an angle of approximately 35 degrees. The inlet has a warped wingwall on the left and a 90-degree wingwall on the right. The upstream banks are stabilized with sack concrete and the outlet is a concrete apron with a notched weir and flared wingwalls.

The replacement bridge is proposed to be an approximately 80-foot-long single-span precast box girder structure. The abutments would likely consist of driven 16-inch-diameter steel pipe or reinforced concrete piles. The height of the bridge over the stream channel would be approximately 16 feet. The deck would consist of precast box units, 2.75 feet deep. The new bridge would follow the same alignment as the existing culvert. In order to construct the new bridge along the existing alignment, the old culvert would be demolished in two phases (half-width construction) to maintain vehicle traffic during construction. First, traffic would be routed over the existing northbound lane (reversible one-way traffic) and the southbound lane of the existing box culvert under the southbound lane would be demolished. Then the southbound lane of the new bridge would be constructed. Traffic would then be routed over the new southbound lane, followed by demolition of the northbound lane and remaining box culvert structure. Finally, the northbound lane of the new bridge would be constructed.

The assumptions listed in this chapter are based on the construction engineer's best estimate of the number, location, and types of structures that would be used, how they would be installed, and the proposed sequence, timing, and duration of construction activities. Figure 3-1 shows the general plan for the new bridge.

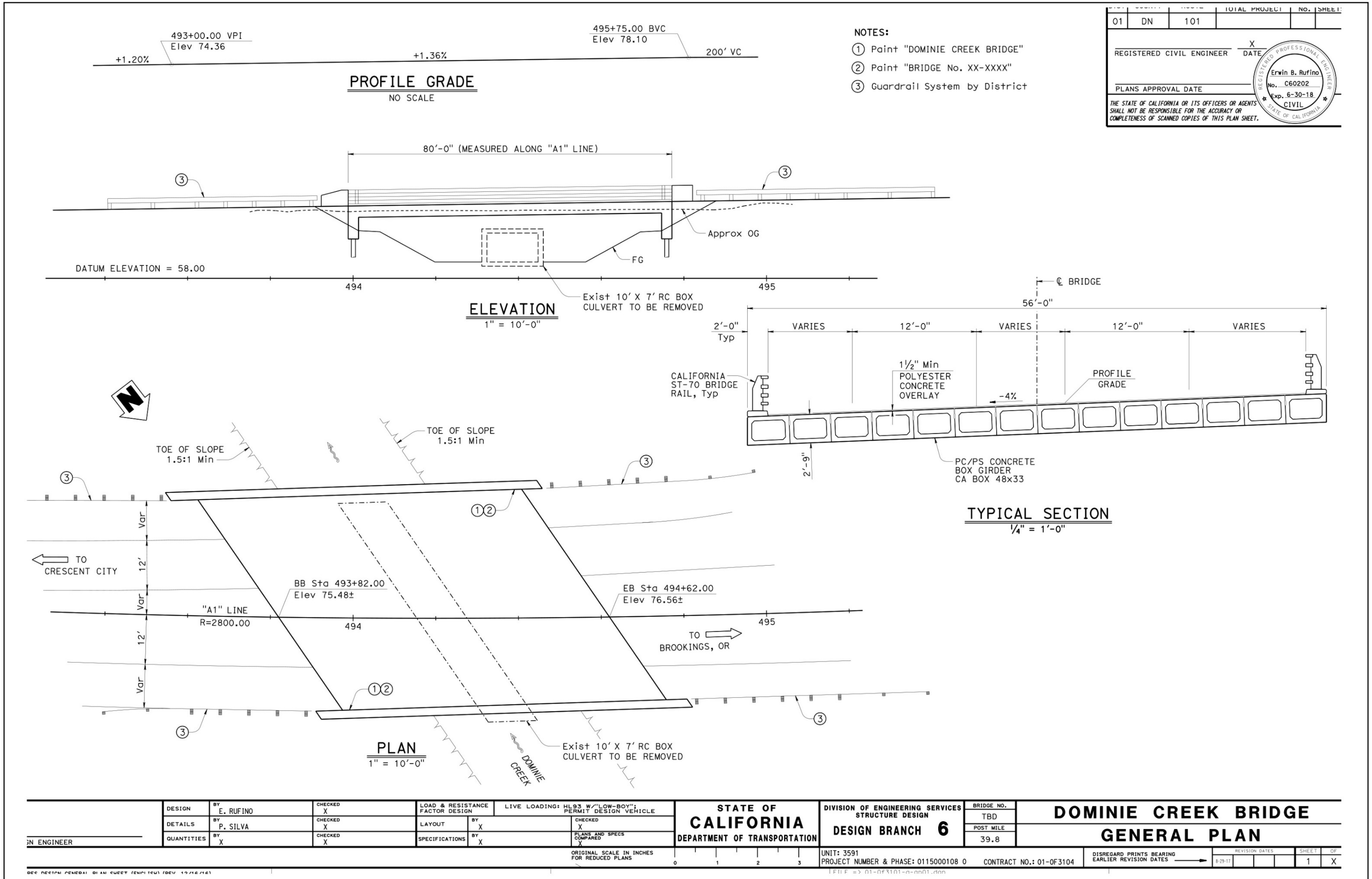

Figure 3-1. General Plan

Figure 3-1. General Plan

This chapter describes the proposed action that was developed to meet the identified purpose and need of the project while avoiding or minimizing environmental impacts. Section 3.3, *Construction Methodology*, describes the project components. Section 3.3.1, *Overview of Major Activities*, provides an overview of major construction activities, and the anticipated construction sequencing and schedule are described in Section 3.4, *Construction Sequencing and Schedule*. Section 3.5, *Standard Measures*, identifies standard measures incorporated into the proposed action to avoid or minimize impacts on the natural environment, and Section 3.6, *Project Operations and Maintenance Activities*, summarizes operations and maintenance activities for the proposed action.

3.2. Authorities and Discretion

Caltrans is the lead for ESA Section 7(a)(2) and MSA Section 305(b) formal consultation under NEPA delegation from FHWA, and will carry out all formal consultation procedures with NMFS commencing with submittal of this BA/EFHA and requesting initiation of formal consultation, culminating in a Biological Opinion (BO) and EFH response issued by NMFS to Caltrans.

A Categorical Exemption performed under the guidance of CEQA and a Categorical Exclusion performed under the guidance of NEPA are currently being prepared for the proposed action.

The proposed action would require a Nationwide Permit issued by the U.S. Army Corps of Engineers (USACE) under Section 404 of the federal Clean Water Act (CWA), a 401 Water Quality Certification issued by the California State Water Resources Control Board under Section 401 of the federal CWA, a Lake and Streambed Alteration Agreement from CDFW, and a grading permit from Del Norte County.

SONCC coho salmon is listed as threatened under CESA. Caltrans anticipates incidental take of coho salmon as a result of implementing the proposed action; therefore, a 2080.1 consistency determination from CDFW is required.

3.3. Construction Methodology

The following construction scenario describes the major construction activities based on standard practices that are most likely to be used by the contractor. The construction schedule and methods would be determined by the contractor, subject to the project plans and specifications and the environmental limitations and permit requirements. After successful bidding and award, the contractor would submit a schedule and methods of construction to be reviewed and approved by Caltrans Construction personnel. The schedule would follow a Critical Path Method schedule model. The specific methods described in this BA are based on best professional judgement by Caltrans and is intended to provide an idea of what may be done to complete this project. Actual methods and their details would only be determined when the contractor is selected. Within the parameters identified by the construction specifications package, the contractor ultimately decides how they would build the bridge after the contract is awarded.

3.3.1. Overview of Major Activities

- Preparation—Signs, stormwater pollution prevention plan (SWPPP), environmentally sensitive area fences
- Clear and Grub—Vegetation removal and installation of access roads before structure work
- Clear Water Diversion—Temporary barrier placed across creek upstream of construction and stream diverted in plastic pipe through culvert to downstream of construction
- Demolish Culvert Southbound Lane—Demolish western portion of box culvert and existing lane of US 101
- Build New Bridge Southbound Lane—Foundation and bridge deck
- Switch Traffic to New Bridge
- Demolish Culvert Northbound Lane—Demolish eastern portion of box culvert and existing lane of US 101
- Build New Bridge Northbound Lane—Foundation and bridge deck
- Remove Sacked Concrete
- Channel Grading
- Remove Clear Water Diversion

3.3.2. Preparation

3.3.2.1. CONSTRUCTION AREA SIGNS

Construction area signs would be used to provide public notice and warning regarding the project and traffic control. Temporary railing (Type K) would be placed approximately from the centerline of US 101 at the culvert to the southbound shoulders to direct traffic to the existing northbound lane. Crash cushions would be placed at the ends of the temporary rails. After the temporary railing, signage, striping, and signal are in place, one-way reversible traffic would be diverted to the northbound lane.

3.3.2.2. STORMWATER POLLUTION PREVENTION PLAN

The contractor would be required to prepare a SWPPP and ensure the proposed action is compliant with the Construction General Permit Order No. 2009-0009-DWQ (or current revision) issued by the State Water Resources Control Board. Work within the active Dominie Creek channel (i.e., below the ordinary high water mark [OHWM]) would be scheduled from June 15 to October 15 during two consecutive construction seasons.

The SWPPP would identify the sources of pollutants that may affect the quality of storm water; include construction site BMPs to control sedimentation, erosion, and potential chemical pollutants; provide for construction materials management; include non-stormwater BMPs, and include routine inspections and a monitoring and reporting plan. All construction site BMPs would follow the latest edition of the *Caltrans Storm Water Quality Handbooks: Construction Site Best Management Practices (BMP) Manual* (California Department of Transportation 2017) to control and minimize the impacts of construction-related activities, materials, and pollutants on the watershed. The project SWPPP would be continually updated to adapt to changing site conditions during the construction phase.

3.3.2.3. ENVIRONMENTALLY SENSITIVE AREA FENCING

Environmentally sensitive areas would be clearly marked and fenced to ensure that construction activities are limited to specified boundaries of the action area.

3.3.3. Clear and Grub

The contractor would remove all vegetation and objectionable material within the temporary construction easements and right of way where work would occur. Trees and environmentally sensitive areas that can be preserved would be protected from disturbance by the contractor. Vegetation clearing would be limited to September 1 to February 28 to avoid removal of active nests.

The contractor would clear and grub staging and access areas as necessary to store material and equipment and access the project site. Graded surfaces above the OHWM would receive erosion control measures, including straw, fiber rolls, rock where needed, and hydroseeding. Equipment used to clear and grub vegetation would likely be a back hoe, chain saw, mower, chipper, and hand tools. Access roads would likely be graded with a back hoe and may be rocked.

3.3.4. Clear Water Diversion

A temporary clear water diversion would be constructed. The diversion would likely consist of a plastic pipe culvert (size to be determined), that would be placed through the existing concrete box culvert, and would extend downstream and upstream outside of the construction limits below OHWM. Water bladders, gravel filled bags and/or other structures such as cofferdams would be placed across the creek upstream of the construction site and water would be diverted through the culvert to downstream of the construction work zone. The exact type of diversion would be selected at the time of implementation. The diversion would extend a total of approximately 410 feet, extending approximately 240 feet upstream of the culvert inlet and 100 feet downstream of the culvert outlet. Sump pumps could be employed, if needed, to remove water from excavated areas within the work zone. Equipment used to install and remove the diversion would include excavators, a boom truck or crane, flatbed truck or semi-trucks, dump trucks, compactors, submersible water pumps, and generators. The diversion would be installed on or after June 15 and would be removed by October 15 during each construction season.

3.3.5. Demolish Culvert Southbound Lane

The southbound guardrails would be removed and asphalt paving would be removed and disposed of by the contractor to a permitted site or for reuse. Earth would be removed from over and around the culvert down to the approximate planned stream channel grades. Concrete headwalls and the west half of the box culvert would be removed from around the temporary clear water diversion culvert. Material would be properly disposed of or recycled by the contractor. Equipment used to demolish the culvert would include hoe rams, possibly jack hammers and concrete saws, asphalt grinders, generators, air compressors, excavators, dump trucks and loaders. Work below the OHWM would be restricted to the dry season construction window (June 15–October 15).

3.3.6. Build New Bridge Southbound Lane

3.3.6.1. SOUTHBOUND LANE ABUTMENT CONSTRUCTION

The abutments and support columns would likely consist of twenty-four 24-inch cast-in-drilled-hole (CIDH) piles. The nearest pile to open water would be located approximately 7.6 meters (25 feet) from the wetted channel. Earthwork would begin with excavation to the bottom of the proposed abutment footings. The piles for the west half of the abutments (supporting southbound lanes) would be constructed first. Temporary casings would be used to stabilize the drilled holes and then removed during concrete placement. The casings would be installed using oscillation. A drilling fluid (synthetic slurry) would be used to stabilize the holes during drilling operations and placement of the reinforcing cage and concrete. The expelled slurry would be contained and pumped into 55-gallon steel drums (or similar) for disposal. Containment, disposal, and spill prevention measures would be implemented for drilling operations (see Section 3.5.2).

3.3.6.2. SOUTHBOUND LANE BRIDGE DECK CONSTRUCTION

The height of the bridge over the stream channel would be approximately 16 feet. The deck would consist of precast box units, 2.75 feet deep and 4 feet wide, constructed offsite. The box unit segments would be delivered to the construction site and placed by crane(s).

After placement of the precast bridge deck, a polyester concrete surface would be placed to provide a wearing surface, and transverse tie rods would bond the precast elements together. The steel bridge rail would be installed. Equipment used to construct the bridge would include crane, generator, air compressor, power tools, saws, drills, nail guns, concrete vibrators, dump trucks, concrete trucks, concrete pump, and concrete washout.

To prepare the roadway for traffic, portions of the existing roadway would receive hot mix asphalt (HMA) overlay to finish grades. The remainder of the roadway would have the existing asphalt obliterated or cold planed prior to placing a final structural section consisting of base rock and HMA paving. Guardrail end treatment and transitions would be added to the southbound bridge rail. Striping would be placed on the roadway for one-way reversible traffic. Equipment used to prepare the roadway would include cold planer, dump trucks, paver, vibratory roller compactor, post hole drill and hammer, air compressor, and air or electric wrenches.

3.3.7. Switch Traffic to New Bridge

Once the southbound lane construction and roadway work is completed, traffic can then be moved to the new roadway. To prepare the roadway for traffic, temporary crash cushions and railings would be relocated. The one-way reversible traffic would then be shifted onto the newly constructed southbound side of the bridge.

3.3.8. Demolish Culvert Northbound Lane

The northbound guardrails would be removed. Asphalt paving would also be removed and disposed of by the contractor to a permitted site, or for reuse in asphalt. Earth would be removed from over and around the culvert, down to the approximate planned stream channel grades. Concrete headwalls and the east half of the box culvert would be removed from around the temporary clear water diversion culvert by hoe rams and an excavator. Material would be properly disposed of or recycled by the contractor. Equipment used to demolish the culvert would include hoe rams, possibly jack hammers and concrete saws, asphalt grinders, generators, air compressors, excavators, dump trucks and loaders. Work below the OHWM would be restricted to the dry season construction window (June 15–October 15).

3.3.9. Build New Bridge Northbound Lane

3.3.9.1. Northbound Lane Abutment Construction

The northbound guardrail and paving would be removed for the construction of the northbound half of the bridge. The construction methods and equipment described for the southbound lane abutment construction (Section 3.3.6.1) would be similar for the northbound lane abutment construction.

3.3.9.2. NORTHBOUND LANE BRIDGE DECK CONSTRUCTION

The construction methods and equipment described for the southbound lane deck construction (Section 3.3.6.2) would be similar for the northbound lane deck construction. Following installation of the guardrail end treatments and transitions, the temporary railing and crash cushions would be removed. The temporary signal system would be removed and striping would be completed on the roadway to return traffic to pre-construction conditions.

3.3.10. Channel Grading

3.3.10.1. REVETMENT REMOVAL

With the clear water diversion in place, the channel within the diversion area would be regraded to final elevations. Concrete sack revetment upstream of the culvert would be removed from the channel banks at this point. Equipment used to remove the concrete sack revetment would include excavator, dump trucks, mini skid loader, hand labor, boom lift, and backhoe.

3.3.10.2. GRADING AND ROCK SLOPE PROTECTION

The bed and banks of Dominie Creek would be reconstructed and graded to design elevations. A bio-engineered streambank protection design involving the use of rock slope protection, earthen fill, and plantings of native vegetation, would be used to stabilize the banks. Equipment used for grading and rock slope protection would include pickup or flatbed trucks, excavator, dump trucks, mini skid loader, hand labor, boom lift, and backhoe.

3.3.10.3. ROUGHENED CHANNEL

The proposed channel design is a roughened channel consisting of a constructed reach stabilized with an immobile framework of large rock mixed with smaller material to create conditions found in steep or confined natural channels (see California Department of Fish and Wildlife 2009, Figure XIII-22). The gradient of the roughened channel would be similar to the existing gradient. The gradient through the culvert would match the existing gradient (3.75%) but would be approximately two feet lower to create a smooth transition between the streambed upstream and downstream of the culvert. There is a bedrock feature downstream of the culvert that provides a natural grade control and that would be unaffected by the Dominie Creek or Rowdy Creek fish passage improvement projects. A typical cross section of the proposed channel is shown in Figure 3-2. This design creates a broad range of depths, velocities, and turbulence over a wide range of flows, providing upstream and downstream passage conditions for salmonids and other species, including smaller, weaker-swimming juveniles. The trapezoidal channel cross section, expanded channel width, and diversity of hydraulic conditions would allow the channel to function similarly to the natural channel with respect to fish passage and debris and sediment transport while reducing the risk of scour during extreme flow events.

The roughened channel would be created through placement of engineered streambed materials. Larger rocks would be placed first, forming a framework, with smaller materials, such as gravels and cobble, filling interstitial spaces. The largest rocks would be sized to avoid excessive constriction. Larger rocks would be expected to be stable within the channel at velocities up to the structural design flow of the road crossing. Equipment used to create the roughened channel would include pickup or flatbed trucks, excavator, dump trucks, mini skid loader, hand labor, boom lift, and backhoe.

3.3.11. Remove Clear Water Diversion

The clear water diversion would be removed and flow established in the constructed channel by removing the temporary cofferdam and bypass pipe. The remaining construction equipment would be removed from the project to complete the construction work.

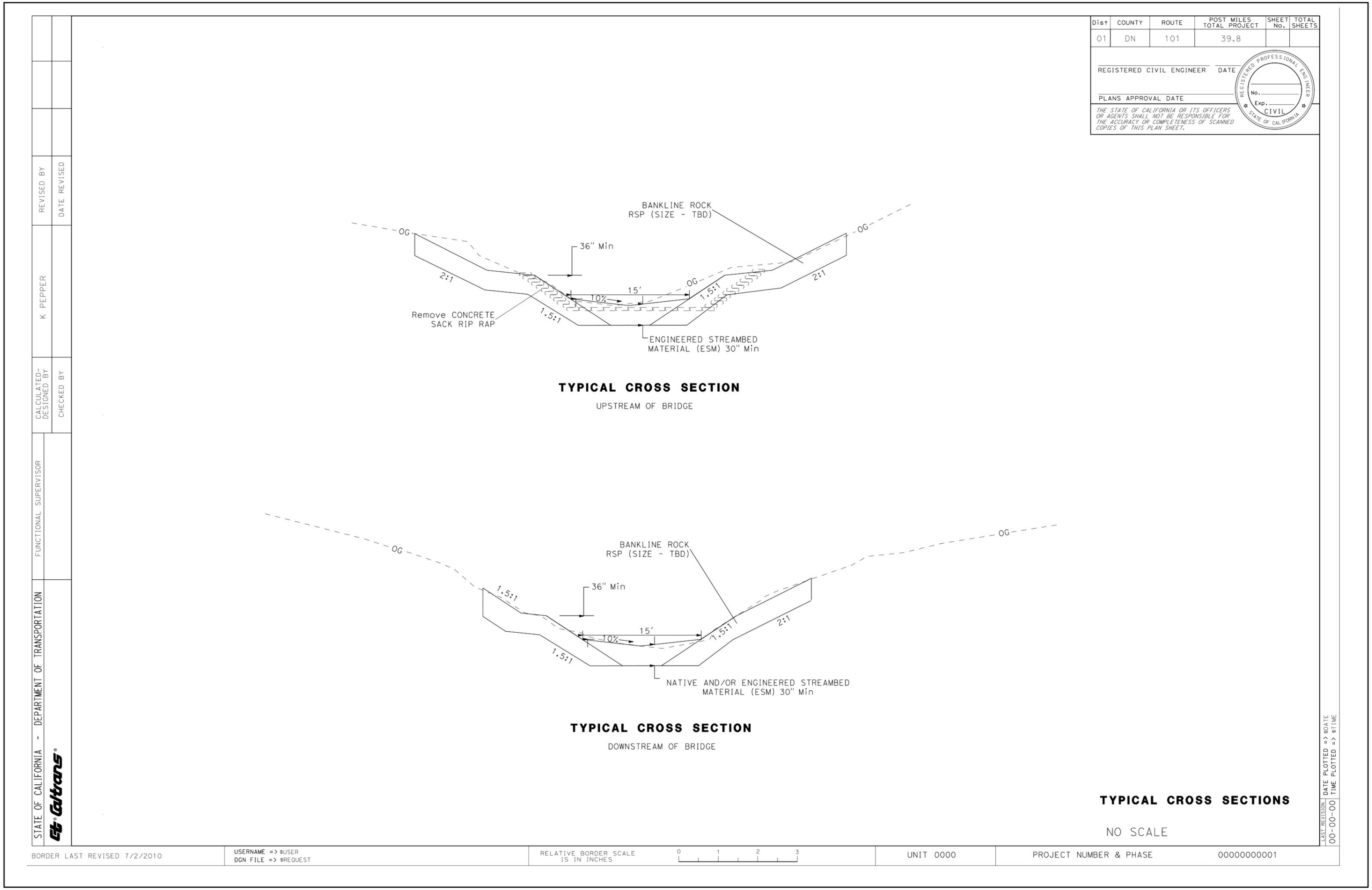

Figure 3-2. Typical Channel Cross Section

Figure 3-2. Typical Channel Cross Section

3.4. Construction Sequencing and Schedule

Construction of the bridge is anticipated to start June 2020 and would be completed within 2 years. Construction could be longer depending on the contractor and seasonal work window restrictions defined in the permit requirements. In each of the 2 years required for construction, the clear water diversion would be installed on or after June 15 and would be removed by October 15. Work that has the potential to directly affect surface waters would be performed after the clear water diversion is installed during each construction season. Demolition activities would only take place after the clear water diversion has been installed and creek flows have been diverted. Activities are expected to occur in the following order: First season—diversion and dewatering, demolition of southbound lane of existing culvert structure, cast-in-drilled-hole pile installation (e.g. oscillation), construction of southbound lane of proposed bridge structure, and removal of clear water diversion; Second season—diversion and dewatering, demolition of northbound lane of existing culvert structure, construction of northbound lane of proposed bridge structure, bank grading and stabilization, installation engineered streambed materials, and removal of clear water diversion.

3.5. Standard Measures

The following section describes standard measures that are included as part of the proposed project. Standard measures are prescriptive and sufficiently standardized to be generally applicable, and do not require special tailoring to a project situation. These are generally measures that result from laws, permits, guidelines, and resource management plans that are relevant to the project. They contain refinements in planning policies and implementing actions. These practices predate the project's proposal and apply to all similar projects. For this reason, standard measures do not qualify as project mitigation, and the effects of the project are analyzed with these measures in place.

Standard measures relevant to the protection of aquatic resources deemed applicable to the proposed action are described below. Caltrans would adhere to all terms and conditions of the regulatory permits and agreements obtained for the proposed project from CDFW, North Coast Regional Water Quality Control Board (NCRWQCB), USACE, and NMFS. Should any additional terms and conditions not identified below arise during project permitting, Caltrans would inform NMFS and reevaluate whether reinitiation of consultation is appropriate prior to construction.

3.5.1. Limited Operations Period

To protect the most vulnerable life stages of sensitive fish species that occur within the project area, in-channel work would be restricted to the period between June 15 and October 15. Construction activities restricted to this period include any work within the bed, channel, or bank of the project watercourse. This seasonal work window corresponds to the period of the year when juvenile salmonid abundance is at its lowest. This work window also avoids the primary migration periods of adult and juvenile salmon (see Table 4-1 in Chapter 4).

Construction activities performed outside of the bed, channel, or bank of a watercourse that have the potential to directly impact surface waters (i.e., soil disturbance that could lead to turbidity pulses) would be performed during the dry season, defined for this project as being between June 15 and October 15, or as weather permits per the approved contractor-prepared SWPPP and/or project permit requirements.

3.5.2. Best Management Practices to Protect Water Quality

To avoid and minimize potential impacts on receiving waters resulting from project construction activities and operations, permanent and temporary measures would be implemented in accordance with applicable stormwater regulations and standards. Long-term permanent measures would consider factors such as permanent stabilization of disturbed soil, natural stormwater quality treatment, and stormwater outfall discharge points. Short-term temporary measures would focus on implementing construction site BMPs, aimed at reducing soil erosion and subsequent sediment transport. Temporary erosion and sediment control measures that may be used during construction include the use of straw mulch, hydroseeding, and erosion control blankets or mats to temporarily stabilize slopes, and the use of silt fences and fiber rolls, and straw bales to capture or filter fine sediment from exposed slopes. All dewatering operations would be conducted in accordance with the Caltrans Field Guide to Construction Site Dewatering (2014).

Containment, disposal, and spill prevention measures would be implemented during drilling operations in accordance with applicable stormwater and pollution prevention regulations and standards. In the event of an unexpected spill of drilling fluid, the drillers would immediately stop drilling, contain the escaping fluid, and mitigate any further potential fluid loss. Any fluid that leaks onto the ground would be collected by placing absorbent pads and absorbent material. Used pads and materials would then be placed in 55-gallon drums (or similar) for disposal. Plastic sheeting and straw wattles may be placed under and around the drill rig, mud tank, and drilled hole to contain incidental fluid spills from the borings. The drilling fluid and water that is expelled from the drilled holes during concrete placement would be pumped from the mud tank into 55-gallon steel drums for disposal. The 55-gallon drums would be removed from the job site and transferred to an appropriate staging area, usually a nearby Caltrans Maintenance Yard, before they are disposed of properly by a licensed Contractor hired by Caltrans Drilling Services.

The project would be compliant with the CGP Order No. 2009-0009-DWQ issued by the State Water Resources Control Board and with the Provisions of the Caltrans Statewide NPDES Permit (order 2012-0011-DWQ). The NPDES Permit requires that new facilities incorporate permanent post-construction site stormwater BMPs to control stormwater discharges for increases in impervious surface areas greater than one acre. In addition, before any ground-disturbing activities, the contractor would be required to prepare and implement a SWPPP to ensure waters of the United States are protected during construction.

The SWPPP would be prepared with the following objectives: (a) to identify pollutant sources, including sources of sediment, that may affect the quality of stormwater discharges from project construction; (b) to identify BMPs to reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges from the project area during construction; (c) to outline and provide guidance for BMP inspections, repairs, and maintenance; (d) to identify project discharge points and receiving waters; (e) to address post-construction BMP implementation and monitoring; (f) to address sedimentation, siltation, turbidity, and non-visual pollutant monitoring, and outline a sampling and analysis strategy, and (g) to create a sampling and analysis plan, monitoring and reporting schedule, and inspection schedule. The SWPPP would describe the BMPs the contractor would use to prevent erosion and sedimentation and would be continuously updated to reflect changing conditions during construction.

PERMANENT DESIGN MEASURES

The project would incorporate pollution prevention and design measures consistent with the July 2011 revision of the Statewide Storm Water Management Program (California Department of Transportation 2003) to meet water quality objectives. This plan complies with the requirements of the Caltrans Statewide NPDES Permit (Order

2012-0011-DWQ). The project would likely include the following permanent stormwater treatment measures:

- Existing roadway and bridge drainage systems currently discharge stormwater to receiving waters through bridge deck drains and/or discharge to vegetated slopes adjacent to the highway facility. Current design for stormwater management, post construction, is to perpetuate existing drainage patterns. Stormwater would continue to sheet flow to vegetated slopes, providing stormwater treatment in accordance with the Caltrans NPDES Permit. Where feasible, drainage would be routed from bridge decks to downgradient abutments instead of using deck drains.

- Existing vegetated areas would be maintained to the maximum extent practicable. Clearing, grubbing, and excavations would be limited to specific locations where the highway, bridge, and road approaches are to be constructed, as delineated on the plans.

- New slopes and temporarily disturbed areas would be stabilized using bio-engineering techniques in streambank design that may incorporate rolled erosion control products (RECP) and vegetation planting. Vegetated surfaces would feature native plants and revegetation would use the seed mixture, mulch, tackifier, and fertilizer recommended in the erosion control plan prepared for the project.

CONSTRUCTION PHASE BEST MANAGEMENT PRACTICES

Caltrans would require that the project contractor(s) implement temporary construction phase BMPs throughout the project to control stormwater discharges and potential discharges of pollutants to surface waters. The SWPPP would include a waste management section that provides procedural and structural BMPs for collecting, handling, storing, and disposing wastes generated by project construction to prevent the accidental release of pollutants. The contractor would also be required to submit a demolition and debris containment and management plan to the Caltrans Resident Engineer for approval prior to construction. The approved plans would meet environmental regulations, permits, consultations, agreements, notices, and details of work as specified in the Environmental Document and environmental applications.

Because project construction would be dynamic, the contractor would determine locations for implementing these BMPs. Adequate material quantities would be available to allow the contractor sufficient flexibility to implement the BMPs as needed. Construction site BMPs related to water quality and anticipated to be incorporated into the approved project SWPPP include, but are not limited to, the following BMPs from the *Caltrans Construction Site BMP Manual* (California Department of Transportation 2017):

1. Existing vegetation would be removed to the minimum extent necessary to facilitate the proposed work (SS-2).

2. Temporary access road entrances and exits would be stabilized and maintained to prevent sediment erosion and transport from the work area (TC-1).

3. Temporary drainage inlet protection methods such as gravel bags would be deployed to prevent sediment and other pollutants from entering drainage systems (SC-10).

4. Perimeter control devices such as fiber rolls, compost socks, and silt fences would be utilized to prevent sediment transport from the project site (SC-6, SC-09).

5. Newly constructed fill slopes would be stabilized with a combination of seed, biodegradable RECP such as fiber rolls, coir blankets, and geotextile fabrics (SS-7).

6. Concrete washout facilities, re-fueling areas, as well as equipment and storage areas should be covered and located away from drainage inlets and waterways to prevent both stormwater and non-stormwater discharges (WM-3, WM-8, NS-9).

7. All dewatering operations would be managed to prevent the discharge of pollutants from the accumulation of water from excavations, temporary stream crossings, and clear water diversions (NS-2, NS-4, NS-5).

8. All dewatering operations would be conducted in accordance with Caltrans Field Guide to Construction Site Dewatering Manual and Standard Specification Section 13-4.01(C) and 13-4.03(G).

9. Bridge foundation installation operations should keep equipment that is in use in streambeds or over waterbodies leak free. The storage and use of equipment would comply with all regulatory permits (NS-11, NS-13).

Site Inspection

The SWPPP would also identify a site inspection schedule depending on type of activity and weather. A qualified person would perform site inspections during construction according to one of two optional schedules. Option 1 consists of performing a site inspection once every 7 calendar days. Option 2 consists of performing a site inspection once every 14 days and within 24 hours of a storm event that produces 0.25 inch or more of precipitation, even if that storm event is still occurring. If the storm event extends through multiple days, producing greater than 0.25 inch of precipitation each day, then a site inspection must be performed after the first 24-hour period after 0.25 inch is recorded, and within 24 hours after the storm ends. The SWPPP must include which option will be adopted for the construction project.

Inspections must include all areas cleared, graded, or excavated where stabilization has not been finished; all stormwater controls, including pollution prevention measures installed, operational, and working as intended; material or equipment storage and maintenance areas; all areas where stormwater flows, including catchment/treatment areas; all water discharge points; and all areas where stabilization measures have been implemented.

Inspections must identify all noncompliance incidents observed, and corrective action initiated if appropriate. If discharge is occurring during the site inspection, it is required that the inspector identify all points of the property where discharge is occurring and observe and document the visual quality of discharge (including color, odor, floating, settled, or suspended solids, foam, oil sheet, and other obvious indicators of pollutants).

Construction Site Dewatering and Diversion Plan

The contractor would be required to prepare and submit a Construction Site Dewatering and Diversion Plan to Caltrans for authorization prior to any dewatering. Temporary diversion and dewatering of the stream would be necessary for demolition of the existing culvert structure, construction of the bridge abutments, and construction of the engineered channel and streambanks. The temporary stream diversion (clear water diversion) would consist of a temporary dam and bypass pipe that would be installed on or after June 15 and removed prior to October 15 during each construction season. The diversion would be of sufficient length to avoid direct disturbance of the active stream during in-channel work, and potential injury of fish from demolition noise (based on estimated distances to currently established noise thresholds for the onset of injury).

3.5.3. Aquatic Species Relocation Plan

The contractor would be required to prepare and submit an Aquatic Species Relocation Plan (as part of the Construction Site Dewatering and Diversion Plan) to Caltrans for approval prior to any dewatering or diversion of Dominie Creek. Fish capture and relocation activities would be supervised by a qualified fisheries biologist with a current state and federal collection permit and appropriate training and experience in fish capture and handling techniques.

The Aquatic Species Relocation Plan would clearly outline the methods for dewatering and aquatic species relocation. Prior to fish capture and relocation activities, suitable release site(s) near the project site would be selected based on the presence of suitable habitat, similar water temperatures, and a low likelihood of fish to re-enter the work site or become impinged on exclusion netting. An effort would be made to avoid concentrating fish at any given location. Prior to any instream work and channel dewatering, fine-mesh block (exclusion) nets would be placed immediately upstream and downstream of the area that is proposed for dewatering.[3] The block nets would span the width of the channel and be secured to the streambed by burying the leading edge of the net with rocks. Exclusion netting would be inspected at least once a day to ensure that the nets remain free of debris and gaps that could allow fish to enter the work area. Once the nets are in place, the field crew would begin fish capture activities.

Appropriate capture methods would be determined by the biologist based on the relative effectiveness of different methods under the prevailing site conditions. To the extent feasible, herding, seining, and dip netting would be used initially followed by the use of backpack electrofishing if the former methods are ineffective or only partially successful. Electrofishing would comply with the procedures described in Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act (National Marine Fisheries Service 2000). Multiple passes would be conducted until no fish are captured on consecutive passes. Following completion of fish capture and relocation activities, the exclusion nets would continue

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[3] It may be determined that a downstream exclusion net is unnecessary if an appropriate physical or hydraulic barrier can act to effectively block fish from entering the work area during fish capture and relocation activities.

to be maintained and monitored until the clear water diversion is in place. Once the clear water diversion is in place, the nets would be removed.

Handling of salmonids would be minimized to the extent feasible. When handling is necessary, hands and/or nets would be wet and free of irritants (e.g. sunscreen) prior to touching fish and amphibians. Fish and amphibians would be held temporarily in five-gallon buckets (containers with lids) filled with creek water and aerated with a battery-powered aerator. Water temperatures would be measured periodically in the capture and relocation areas and in the holding buckets. If necessary, partial water changes would be periodically conducted to maintain stable water temperatures. If water temperature reaches or exceeds 18°C, fish would be released and capture and relocation activities would cease. Overcrowding and predation in containers would be avoided by segregating smaller fish (e.g., YOY salmonids) from larger fish into two or more containers. Larger amphibians, such as Pacific giant salamanders, would be placed in the container with larger fish to prevent predation on YOY. If unforeseen injury or mortality of salmonids is observed, project activities would cease and NMFS and CDFW would be contacted immediately.

A record would be maintained of all fish relocated. The number of fish captured would be counted and recorded. The record would include date of capture and relocation, method(s) of capture, location of the relocation site(s), and the number, species, and approximate sizes of fish captured and relocated. The record would be provided to NMFS and CDFW within 30 days of the completion of the relocation.

3.5.4. Pre-construction Meeting and Worker Education

The pre-construction 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 and construction site management.

3.5.5. Biological Monitoring

A qualified biologist would monitor all in-stream construction activities, and be present during dewatering activities and fish relocation to ensure adherence to all environmental permit conditions and avoidance and minimization measures during construction. Presence of the biological monitor reinforces the expected effectiveness of construction site BMPs and contractor compliance with these measures. If any listed species are found dead or injured, all project activities would cease and NMFS and CDFW would be contacted immediately. Project activities may resume only after

NMFS and CDFW have reasonable assurances that no additional mortalities of listed species would occur.

3.5.6. Hydroacoustic Monitoring and Abatement

Subject to feasibility, hydroacoustic monitoring would be conducted during demolition (hoe ramming) activities. Hydroacoustic monitoring would ensure compliance with the terms and conditions resulting from Section 7 consultation with NMFS, and provide an opportunity to adopt alternative construction methods, if feasible, in the event that these terms and conditions are exceeded. Based on the analysis performed by Caltrans, peak sound pressure levels (SPL) are not expected to reach threshold values known to be injurious to fish, and accumulated sound exposure levels (SEL) sufficient to potentially cause injury are not expected to extend to the active stream (see Section 5.2.6, *Fish Passage*).

3.5.7. Provisions for Use of Artificial Light at Night

Artificial night lighting may be required during construction. The use of artificial light would be limited to critical construction needs (i.e., due to accelerated work schedule to meet permit deadlines or reaching a critical juncture in work at a time when it would be infeasible to stop construction) to minimize the effects of artificial light on sensitive biological resources. When needed, lighting would be directed away from the channel and focused specifically on areas of active construction.

3.5.8. Revegetation, Plant Establishment, and Invasive Weed Control

After all construction materials are removed, the project area would be restored to a natural setting by grading, placing erosion control, and replanting. A revegetation and monitoring plan would be developed that outlines methods that would be implemented to restore all areas temporarily affected by construction. The objective of this plan would be to restore onsite riparian habitat at a minimum ratio of 1:1 subject to the final permitting requirements and coordination with the resource agencies to ensure no net loss of riparian function. The plan would include the collection of baseline data to characterize existing vegetation types and species composition, and measures to avoid native riparian trees and shrubs (especially those providing shade and bank stabilization) to the extent possible. Unavoidable losses of riparian vegetation would be replaced by replanting all temporary access areas within the upper riparian zone of the creek and implementing a bioengineered streambank protection design within the lower riparian zone. All planted vegetation would consist of native plants appropriate to the region, vegetation type, and soil types disturbed by project activities. Natural vegetation recruitment is likely, and would be incorporated into planting considerations and revegetation goals.[4]

After erosion control materials are in place (e.g., biodegradable fiber rolls), disturbed areas would be revegetated with permanent erosion control seeding, consisting of a mix of native species of grasses and low growing forbs. The seed would serve to quickly establish an herbaceous cover. Riparian plantings would utilize a combination of plant material that may include bare root stock, container stock, and/or salvaged material collected onsite. Bare root and/or container plants would be planted in holes twice as wide as and slightly deeper than root or container size, with organic compost incorporated into the hole and soil. Plants would be deep watered immediately after planting (soils would be saturated beyond the first several inches), and mulched. Additional watering as well as weeding would continue for the required plant establishment period that would be determined during the permitting process.

Replanting would be subject to a plant establishment period as defined by project approvals, which would require Caltrans to adequately water plants, replace unsuitable plants, and control pests. Caltrans would also implement a program of invasive weed control in all areas of soil disturbance caused by construction to improve habitat for native species in and adjacent to disturbed soil areas within the project limits.

3.6. Project Operations and Maintenance

The new facilities, including the new bridge and drainage systems, would be subject to regular inspection, maintenance, and repair. Drainage and bridge maintenance would be performed in accordance with operation procedures outlined in the Caltrans Storm Water Quality Handbook Maintenance Staff Guide (California Department of Transportation 2003). Periodic maintenance activities include litter and debris removal and vegetation management. Drainage systems would be maintained to prevent flooding and allow unobstructed flow. Caltrans Maintenance staff would remove litter and debris as needed to avoid damage to stormwater drainage systems and watercourses. The frequency of removal would be dependent on the availability of resources, safety considerations, and rate of accumulation. Maintenance cleanout would occur during the dry or low-flow season when possible. Vegetation management would include the mowing of road shoulders, tree trimming to retain site

[4] Specific streambank design information is not yet available but would likely include incorporation of soil and native tree and understory plantings within the rock slope protection.

distance for the traveling public, and removal of debris caused by storm damage. These maintenance activities would not materially change in frequency, intensity, or duration and are not expected to negatively affect aquatic species.

3.7. Interrelated and Interdependent Actions

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02). The Dominie Creek Fish Passage Project is being proposed to address CESA mitigation requirements for incidental take of coho salmon associated with the Dr. Fine Bridge Project. Therefore, the Dominie Creek Fish Passage Project is an interrelated action. The Dr. Fine Bridge Project will be subject to separate consultation pursuant to Section 7 of the Endangered Species Act.

3.8. Action Area

The action area, as defined under the ESA, includes those areas that would be affected directly or indirectly by the federal action and not merely the immediate area involved in the action [50 CFR 402.02]. The action area is determined, in part, by the activities associated with the proposed action and the site geography, topography, and hydrology, along with an understanding of the distribution, habitat requirements, phenology, and vulnerability of federally listed species potentially occurring in the vicinity of the proposed action.

The action area includes the entire construction footprints of the proposed action, and would extend upstream and downstream to the limits of temporary increases in turbidity, suspended sediment, and underwater noise.

Chapter 4. Environmental Baseline

Regulations at 50 CFR 402.02 define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed federal projects in the action area that have already undergone formal or early Section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation process (50 CFR 402.02). It does not include the effects of the action under review in the consultation (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). This BA identifies antecedent conditions for individual coho salmon before any new stressors are produced by the action under consultation.

Through technical assistance with NMFS and CDFW and review of available literature and records of species occurrence in the Smith River watershed, it was determined that the federally listed SONCC ESU of coho salmon have the potential to occur in the action area. The designated critical habitat for SONCC coho salmon includes the action area (64 FR 24059 and 76 FR 65324).

4.1. Dominie Creek Watershed

Dominie Creek is a tributary of Rowdy Creek, which is a tributary of the Smith River. The Smith River watershed is located within the North Coast Hydrologic Region. The North Coast Hydrologic Region encompasses an area of 12.46 million acres (19,470 square miles) and includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma Counties. Small areas of Shasta, Glenn, and Marin Counties are also within the region (California Department of Water Resources 2003a).

The climate of the Smith River watershed is Mediterranean, with warm dry summers and cold, wet winters. Temperatures are mild with averages ranging from 44 degrees Fahrenheit (°F) to 60.9°F (Western Regional Climate Center 2018). Average annual precipitation is 89 inches (California Department of Transportation 2018c), with the wettest months occurring from October to April.

Dominie Creek originates in the coastal foothills of the Smith River watershed and flows approximately 5 miles through mostly undeveloped land before reaching the project site. It joins Rowdy Creek approximately 730 feet downstream of the project site. Rowdy Creek flows for another 2 miles before reaching the mainstem of the

Smith River. The Smith River discharges into the Pacific Ocean approximately 6 miles downstream from the action area.

The Dominie Creek watershed drains approximately 3.7 square miles of mostly undeveloped forested terrain (Lang 2005). The basin ranges from an elevation of 53 feet to approximately 1,800 feet. Dominie Creek within the 5-mile reach upstream of the project site is highly incised with a single well-defined channel. Approximately 1.6 stream channel miles upstream of the project site is estimated to be available for occupation by fish before becoming too steep. Within the action area, the creek has a riffle-pool bed form composed largely of boulders, natural gravels and fines (GHD 2015). Dominie Creek immediately upstream and downstream of the project site is characterized by a single, confined channel bordered by steep banks. The channel upstream of the culvert is characterized by shallow riffle-run type habitat and steep banks armored with sack concrete. The average slope of the channel between the culvert outlet and the confluence of Dominie Creek with Rowdy Creek is approximately 3% (GHD and Michael Love & Associates 2015). The gradient within the culvert is 1.4% (Lang 2005). The gradient of the channel measured from immediately upstream of the culvert inlet to the channel immediately downstream of the outlet weir is 3.75%.

4.2. Hydrology and Water Quality

Dominie Creek is a tributary of Rowdy Creek, which is a tributary of the Smith River. The Hydrology and Water Quality

The project area is located in the Smith River Plain Hydrologic Subarea of the Lower Smith River Hydrologic Area, within the Smith River HU. Streamflow rates vary greatly throughout the year and are directly correlated to substantially greater precipitation during the winter months and minimal precipitation during the late summer. Using ungaged flow statistics, 2-year peak flows are estimated to be 549 cubic feet per second (cfs). Estimated 100-year flows are 1,963 cfs and 50-year flows are 1,745 cfs (Lang 2005).

The Smith River Plain Hydrologic Subarea of the Lower Smith River Hydrologic Area is not included on the 2012 CWA Section 303(d) list of impaired water bodies, categories 4a and 5 (North Coast Regional Water Quality Control Board 2012). This means that the Smith River is generally less impaired by pollutants such as sedimentation/siltation, water temperature, nutrients, and organic enrichment/low dissolved oxygen (DO) than other similar northern California rivers. Likewise, no Total Maximum Daily Load (TMDL) addressing temperature, DO, nutrients, and microcystin have been set for the Smith River or its tributaries. Temperature logging data for Dominie Creek indicates that it is among the coldest streams in the Smith River watershed; maximum weekly maximum temperatures during the summer (mid-June through September) of 2010 and 2011 ranged from approximately 13°C (55.4°F) to 14.5°C (58.1°F) (Garwood et al. 2014).

4.3. Natural Communities

Vegetation communities were classified based on the dominant plant species. *Alnus rubra* Red Alder Forest Alliance (red alder forest) occurs in the riparian zone of Dominie Creek and was determined to be the only natural habitat community in the action area (Figure 4-1). In addition to red alder, this community type includes bigleaf maple (*Acer macrophyllum*) and several species of willow (*Salix* sp.). Understory vegetation near the creek includes western sword fern *(Polystichum munitum*), California blackberry (*Rubus ursinus*), salmonberry (*Rubus spectabilis*), and fringe cups (*Tellima grandiflora*). The riparian habitat in the action area has been subject to disturbances associated with road construction and maintenance, industrial activity (small businesses and paved lots), and bank stabilization (sack concrete banks). Ruderal (disturbed) areas are also present in the action area, primarily along the shoulders of US 101. Representative species include English daisy (*Bellis perennis*), Rattlesnake grass (*Briza maxima*), Italian thistle (*Carduus pycnocephalus*), Queen Anne's lace *(Daucus carota*), tall fescue (*Festuca arundinacea*), rough cat's ear (*Hypochaeris radicata*), pennyroyal (*Mentha pulegium*), little hop clover (*Trifolium dubium*), and spring vetch (*Vicia sativa* subsp. *sativa*).

4.4. Southern Oregon/Northern California Coho Salmon

The SONCC coho salmon ESU includes all naturally spawned populations of coho salmon in coastal streams between Cape Blanco, Oregon (Elk River), and Punta Gorda, California (Mattole River), as well as salmon produced by three artificial propagation programs: the Cole Rivers Hatchery (Rogue River) in Oregon, and Trinity River and Iron Gate (Klamath River) hatcheries in California (National Marine Fisheries Service 2014). The SONCC coho salmon ESU was originally listed as threatened under the federal ESA in 1997 (62 FR 24588, May 6, 1997). The threatened status was reaffirmed in 2005 (70 FR 37160, June 28, 2005) and 2016.

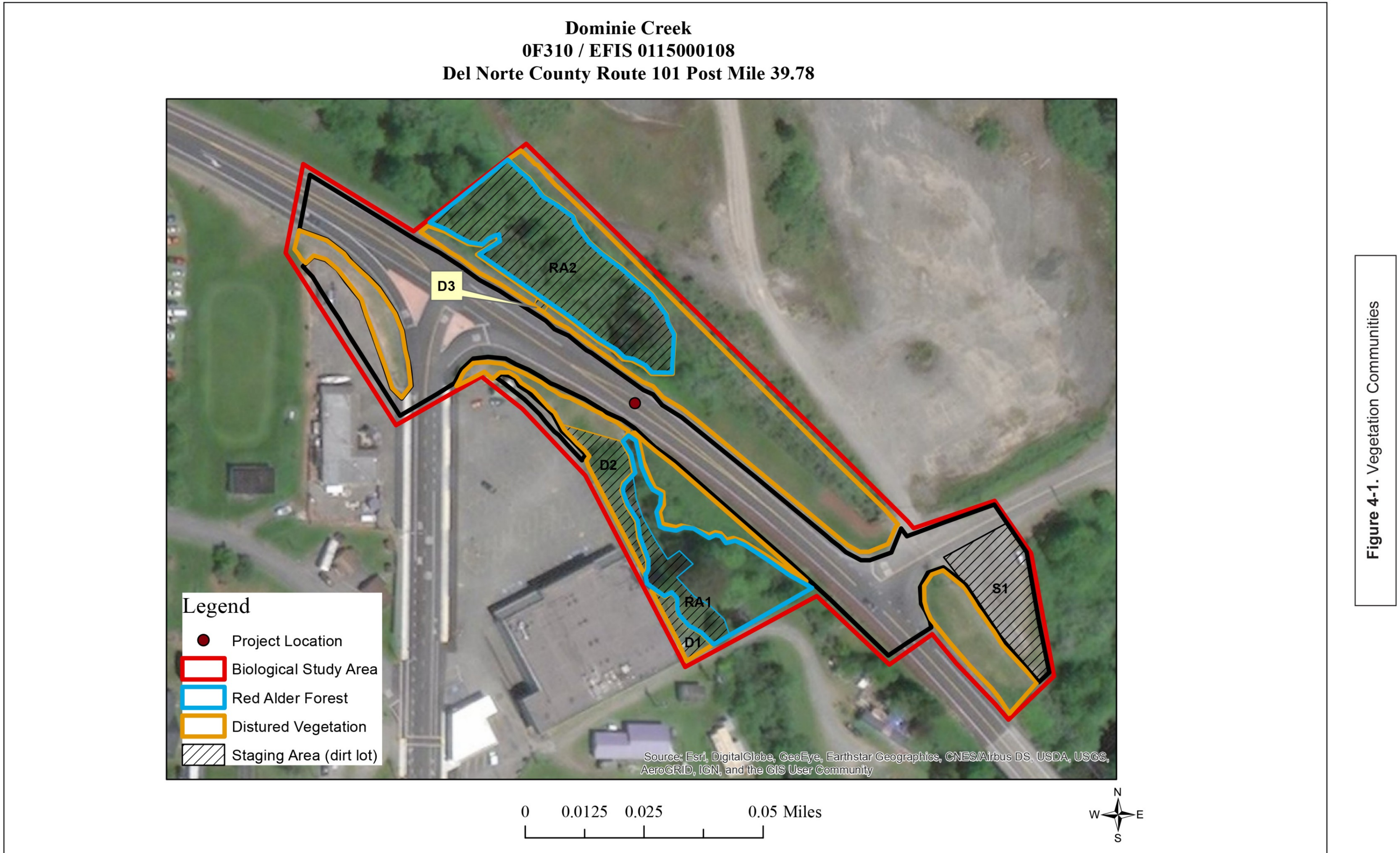

Figure 4-1. Vegetation Communities

NMFS designated critical habitat for SONCC coho salmon on May 5, 1999 (64 FR 24049-24062). Designated critical habitat encompasses all accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon, inclusive (64 FR 24049, May 5, 1999). Critical habitat includes all waterways, substrate, and adjacent riparian zones below longstanding, naturally impassable barriers. Excluded from SONCC coho salmon designated critical habitat are: (1) areas above specific dams; (2) areas above longstanding, naturally impassible barriers (i.e., natural waterfalls in existence for at least several hundred years); and (3) tribal lands.

Essential coho salmon habitat includes those sites and habitat components that support one or more life stages including (1) juvenile summer and winter rearing areas; (2) juvenile migration corridors; (3) areas for growth and development to adulthood; (4) adult migration corridors; and (5) spawning areas. Within these habitats, essential physical and biological features include adequate: (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions. In addition, designated freshwater and estuarine critical habitat includes riparian areas that provide the following functions: shade, sediment, nutrient or chemical regulation, stream bank stability, and input of large woody debris (LWD) or organic matter (64 FR 24049, May 5, 1999).

In 2011, NMFS completed a status review of the SONCC coho salmon ESU (National Marine Fisheries Service 2011) and determined that the ESU, although trending downward in abundance, should remain listed as threatened. Based on a recent status review, NMFS reaffirmed the threatened status, concluding that the extinction risk does not appear to have changed since the 2011 status review (National Marine Fisheries Service 2016).

The listing of SONCC coho salmon initiated the development of a recovery plan for the ESU that includes delisting goals. The Final Recovery Plan for the SONCC coho salmon (79 FR 58750, September 30, 2014) includes establishment of population-level and ESU-level recovery criteria for independent populations of SONCC coho salmon. SONCC coho salmon has been listed as threatened in California since 1995, and a recovery strategy was adopted by the California Fish and Game Commission in February of 2004 (California Department of Fish and Game 2004).

4.4.1. Life History of SONCC Coho Salmon

Coho salmon are anadromous fish that generally exhibit a three-year life cycle. Juveniles rear in freshwater for up to 15 months and then migrate to the ocean where they spend up to 18 months before returning as adults to spawn (Moyle et al. 2008). Some males, called “jacks”, may return after only 6 months at sea (at age two), but most males and virtually all females return after 18 months in the ocean (at age three). In California, the timing of upstream migration varies among tributaries but generally occurs from September through January with a peak in November and December (Moyle et al. 2008). In small coastal streams, migration frequently begins between mid-November and mid-January after high flows open the sand bars that form at the mouths of estuaries.

In California, coho salmon spawn mainly from November to January. Most spawning takes place in tributary streams with a gradient of 3% or less. Females construct gravel nests (redds) in coarse, loose gravels (<15 cm average diameter) commonly at the heads of riffles or tails of pools (Moyle et al. 2008). Both males and females die after spawning, although the female may guard a redd for up to 2 weeks (Hassler 1987). Incubation lasts 8 to 12 weeks, depending largely on temperature, and fry emerge between March and July with peak emergence occurring from March to May (Shapovalov and Taft 1954). According to Bjornn and Reiser (1991), the optimal thermal range for coho salmon egg incubation is between 40°F and 55°F. At temperatures ranging between 46.4°F and 51.8°F, embryos generally hatch after 42 to 63 days of incubation and fry emerge from redds (after yolk sac absorption) after another 32 to 46 days (Murray and McPhail 1988).

Following emergence, fry seek out shaded stream margins, backwaters, and side channels where water velocity is low and small invertebrates are abundant (National Research Council 2004; California Department of Fish and Game 2004). As they grow larger, juveniles (parr) begin to establish feeding territories (Shapovalov and Taft 1954; Sandercock 1991). Juvenile rearing usually occurs in tributary streams with a gradient of 3% or less, although they may move up streams with as much as 5% gradient (National Marine Fisheries Service 2014). Preferred rearing habitat consists of low-velocity, pool habitat with complex woody cover (Moyle 2002; Quinn 2005). Cool water is necessary for coho salmon development. Water temperatures between 53.6°F and 57.2°F are favored for rearing (Bjornn and Reiser 1991), but have been found at temperatures as high as 84°F (Moyle 2002). During summer, juvenile coho move into deep pools or backwater areas with dense shade, LWD, undercut banks, and overhanging vegetation for refuge from high temperatures (Hassler 1987; Brown et al. 1994).

Juveniles typically rear in their natal stream for one year before emigrating to the ocean but may spend up to two years in freshwater or emigrate to the estuary shortly after emerging from spawning gravels (Bell and Duffy 2007). As observed throughout their range, SONCC coho salmon exhibit a broad range of juvenile life history patterns that include spring and fall movements (redistribution) of juveniles to non-natal tributaries and estuaries prior to seaward migration (Miller and Sadro 2003; Koski 2009; Bennett et al. 2011; Jones et al. 2014). Such movements may occur following the first fall rain freshets and have generally been attributed to competition for food and/or space, displacement by high flows, and volitional movements to preferred overwintering habitat (Koski 2009). Non-natal rearing habitats include low-gradient tributaries, sloughs, off-channel ponds, beaver ponds, and other slack-water freshwater and estuarine habitats.

Seaward migration of SONCC coho salmon generally occurs from late March or early April through June with a peak in April to late May/early June (Weitkamp et al. 1995). Their downstream migration to the ocean is accompanied by a series of changes in morphology, physiology, and behavior (smoltification) needed for the transition to saltwater. Travel rates to the ocean are determined by flow rates, date, distance, and the extent of parr-smolt transformation.

4.4.2. Status of SONCC Coho Salmon and Critical Habitat in the Smith River Watershed

The Smith River coho salmon population is identified as a core, functionally independent population within the Central Coastal diversity stratum of the SONCC ESU. The risk of extinction for the Smith River population of coho salmon is considered high, with the population likely below the depensation threshold[5] (National Marine Fisheries Service 2014, 2016).

Historically, coho were widespread in the Smith River watershed, likely occupying all low-gradient tributaries of the lower watershed where intrinsic potential is highest

[5] Depensation refers to a population level low enough that stochastic processes can create alterations in genetics, breeding structure, and population dynamics. These stochastic processes operate to create a feedback loop that can lead a population toward extinction even without additional physical stressors.

based on juvenile rearing potential (Williams et al. 2006). Recent surveys of spawning adults, redds, and juveniles have documented coho salmon in many tributaries throughout the Smith River basin (Garwood and Larson 2014; Walkley and Garwood 2017). The highest occupancy by coho salmon has been observed in low-gradient tributaries of the lower watershed. Mill Creek, which has been the focus of a long-term salmonid monitoring program since 1994 (McLeod and Howard 2010), has been the largest and most persistent source of natural production in the basin. Since 1994, annual escapement estimates for this Smith River tributary have been less than 100 fish in many years with a peak in abundance of approximately 237 in 2005 (McLeod and Howard 2010).

Human activities that have degraded coho salmon habitat in the Smith River include timber harvest, road building, agriculture, urbanization, mining (e.g., placer, hard rock, and gravel mining), flood control (e.g., levees and tide gates), ranching, and pesticide use. Although habitat quality in the middle and upper portions of the basin have not been heavily altered, historic losses and degradation of overwintering and summer rearing habitat in the lower watershed and estuary of the Smith River from channelization/diking associated with agriculture, ranching, and urban development are recognized as major stressors on juvenile coho production (National Marine Fisheries Service 2014). Overwintering habitat in the tributaries is also recognized as a major limiting factor for juvenile production and overall carrying capacity of the watershed (Stillwater Sciences 2006).

Floods over the last 150 years have greatly affected stream channels and riparian ecosystems in the Smith River by mobilizing large amounts of sediment and causing substantial channel aggradation and widening, removal of riparian vegetation, and subsequent loss of LWD (Payne and Associates 1989; Gale and Randolph 2000). In addition, small scale gravel mining and water diversions have had localized impacts on coho salmon habitat by causing sediment disturbances and reducing tributary in-stream flows (National Marine Fisheries Service 2014). High pesticide use associated with agriculture in the Smith River plain adjacent to streams and drainages that enter the Smith River estuary may also be affecting the survival of coho salmon.

4.4.3. Life History of SONCC Coho Salmon in Smith River Watershed

Table 4-1 provides a general summary of coho salmon life stage occurrence in the Smith River watershed. This table was developed from general life history information for SONCC coho salmon described in Section 4.4.1, *Life History of SONCC Coho*

Salmon, and several key sources of information on life history, distribution, and abundance of coho salmon in the Smith River.

Table 4-1. General Life History Periodicity of Coho Salmon in Smith River

SPECIES AND LIFE STAGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SONCC Coho Salmon												
Adult migration [1]												
Spawning [2]												
Egg Incubation[4]												
Emergence/Fry [2]												
Juvenile Rearing/ Redistribution[5]												
Smolt Outmigration[3]												
[1] Larson & Associates (2013); [2]Walkley and Garwood (2017); [3]McLeod and Howard (2010); [4]Shapovalov & Taft (1954); [5]NMFS (2014), Walkley and Deibner-Hanson (2017)												

Potentially Present

Peak Occurrence

As observed in other Pacific Northwest streams, coho salmon in the Smith River exhibit a broad range of juvenile life history patterns that include spring and fall movements (redistribution) of juveniles to non-natal habitats in lower river reaches and estuaries. The early life history of coho salmon generally includes a freshwater rearing period of 1 or 2 years before juveniles migrate seaward in spring. Monitoring of emigrating juveniles in Mill Creek indicates that smolting juvenile coho salmon (age 1+) likely pass through the lower Smith River and action area primarily from March through June with peak emigration in April and May (McLeod and Howard 2010; Walkley and Deibner-Hanson 2017). Outmigrant monitoring in Mill Creek has also detected downstream movements of coho juveniles in the fall, winter, and spring, including the early emigration of YOY juveniles (age 0+) soon after their emergence in spring (March through June) (Parish and Garwood 2015, 2016; Walkley and Deibner-Hanson 2017). Subsequent passive integrated transponder tag detections in the lower Smith River and estuary indicates that a significant proportion of juvenile coho salmon that emigrate from Mill Creek in late fall and winter use the lower river and tributaries for overwintering (Parish and Garwood 2015, 2016).

Recent surveys of juvenile salmonid distribution in the Smith River coastal plain and estuary indicate that non-natal rearing in the summer occurs mostly in the mainstem river and freshwater portions of the estuary, but shifts to tributaries and sloughs of the lower river and estuary in winter (Parish and Garwood 2015, 2016). In both summer and winter, cover complexity was identified as a dominant variable influencing juvenile coho salmon occupancy of non-natal habitats in the lower Smith River, reflecting the strong association of juveniles with physically complex habitats such as alcoves, backwaters, and edge waters with large volumes of woody debris commonly associated with beaver activity (Parish and Garwood 2015). In the mainstem Smith River, these sites (“apex monitoring sites”) generally had high and stable juvenile occupancy probabilities through the summer despite increasing water temperatures. Continuous water temperature monitoring at apex monitoring sites found that maximum weekly average temperatures in the summer averaged 70.5°F (66.7–71.4°F), indicating that water temperatures frequently exceed the thermal limits for rearing juveniles as defined in the literature (Parish and Garwood 2015). However, these monitoring sites were characterized by either a tributary confluence or coldwater seep with dense overhanging cover, relatively deep water (>1 meter), and some degree of thermal stratification that may have allowed juveniles to survive peak summer water temperatures.

4.4.4. Occurrence of SONCC Coho Salmon in Action Area

Dominie Creek in the action area provides potential spawning habitat and year-round rearing habitat for juvenile coho salmon. Rowdy Creek, immediately downstream of the action area, serves as a migration corridor and also supports spawning and rearing of coho salmon. Because of this, there is potential for adult coho salmon to be present in the action area in Dominie Creek. Based on angler surveys and limited counts of returning adults at the Rowdy Creek Hatchery (reported by Larson & Associates 2013), adult coho salmon occur in the Smith River primarily from November to mid-January as they migrate to spawning areas in Rowdy Creek. Spawning generally occurs from late November through February based on observations of live adults, carcasses, and redds in the Mill Creek basin (Garwood and Larson 2014; Walkley and

Garwood 2017). Sspawning has been observed in the action area in winter 2011-12 (Garwood and Larson 2014).

Snorkel surveys conducted in Dominie Creek in recent years (2012–2017) have documented Chinook salmon (YOY), coastal cutthroat trout (YOY to age 2+), and steelhead/rainbow trout (juvenile) (Walkley and Garwood 2017). Coho salmon were not detected in Dominie Creek during these surveys but have been documented in past surveys of Dominie Creek (Garwood 2012).

Chapter 5. Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR 402.02). Direct effects are those effects caused by the proposed action that occur at the time of the action, and indirect effects are those effects caused by the proposed action but that occur later in time (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1998). The applicable standard to find that a proposed action is not likely to adversely affect listed species or critical habitat is that all of the effects of the action are expected to be discountable, insignificant, or completely beneficial. Discountable effects are extremely unlikely to occur. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Beneficial effects are contemporaneous positive effects without any adverse effects on the species or critical habitat.

This chapter provides an analysis of the direct and indirect effects of the proposed action on federally listed SONCC coho salmon and their designated critical habitat. Factors considered in the analysis include the spatial extent, duration, magnitude, and frequency of project effects on individual fish and on the physical and biological features of critical habitat that support spawning, rearing, and migration of SONCC coho salmon within the action area. Potential effects of the proposed action on SONCC coho salmon and designated critical habitat (Section 5.2, *Potential Effects on SONCC Coho Salmon and Designated Critical Habitat*) are discussed under the following impact categories.

- **Water Quality—**Temporary increases in turbidity, suspended sediment, and contaminant risk during in-water construction and demolition activities
- **Noise and Visual Disturbance—**Potential behavioral effects from general construction/demolition noise and visual disturbance
- **Demolition Noise—**Potential injury and mortality of fish from exposure to demolition (hoe ramming) noise exceeding established thresholds for injury
- **Direct Injury—**Potential injury/mortality from direct contact with construction equipment/materials and capture/relocation

- **Fish Passage—**Potential migration delays and increased exposure of juveniles to predation during passage through the clear water diversion
- **Habitat Impacts—**Temporary loss of riparian habitat from clearing of vegetation for construction access and streambank stabilization, temporary loss of in-channel habitat from channel dewatering, and permanent effects on in-channel conditions from stream channel and bank stabilization

5.1. Effects Analysis

The analysis in this chapter uses information on species life history, distribution, and habitat use from published literature and fish survey and monitoring reports to evaluate the potential for exposure of coho salmon to various environmental stressors resulting from the effects of the proposed action. The first step of the analysis identifies the spatial and temporal extent of these stressors, and whether and to what extent these stressors overlap with the occurrence of listed fish species or their critical habitat. This is followed by an assessment of the likely response of individuals to these stressors and the effects of the stressors on critical habitat.

The following analysis is based on general life history information and fish monitoring data from the Smith River and other Northern California streams (National Research Council 2004; McLeod and Howard 2010; Jones et al. 2014; Wallace et al. 2015; Walkley and Garwood 2015, 2017; Parish and Garwood 2015, 2016; Walkley and Deibner-Hanson 2017; and Walkley and Deibner-Hanson 2017). This information indicates that coho salmon juveniles exhibit at least four basic life history strategies:

- Natal stream rearing and rapid migration of age 1+ juveniles to the ocean in spring (April–June) of the following year.
- Downstream movements of age 0+ juveniles in the first spring (April–June) and residence in the lower reaches of the watershed (mainstem and tributaries) through summer and early fall.
- Downstream movements (redistribution) of age 0+ juveniles following the first large flow events in fall (typically starting in November) and residence of these juveniles mainly in smaller tributary and off-channel habitat through winter and spring.
- Rapid seaward migration of age 1+ juveniles from non-natal overwintering habitat in spring (April–June).

The proportions of the population exhibiting these different strategies appear to be highly variable from year to year. Factors likely contributing to this variability include stream rearing densities (i.e., availability of suitable rearing and refuge habitat in natal streams), the timing and magnitude of high flows (causing downstream movements through displacement or behavioral cues), and annual and seasonal variability in the availability of suitable non-natal rearing habitat (Stillwater Sciences 2006). In addition, much of the survey data used for evaluating exposure in this analysis were collected using methods to determine species distribution and habitat occupancy patterns and not to provide measures of fish density or abundance. Because of this uncertainty, it is impractical to quantify the number of individuals that may be exposed to specific project actions. Therefore, the potential for exposure of listed species to a given stressor is evaluated qualitatively based on the timing, duration, and extent of the stressor relative to the timing, distribution, and relative abundance of the species or life stage of concern.

Body size is an important factor influencing the relative vulnerability of fish to environmental stressors and is used as the basis for evaluating the potential risk of physical injury, stranding, and predation in response to physical disturbances of aquatic habitat during construction. General information on seasonal size distributions of juvenile coho salmon indicate that SONCC coho juveniles increase from around 40 mm in early spring to around 60 mm by early summer and 70 mm by late summer or early fall (Wallace et al. 2015).

5.2. Potential Effects on SONCC Coho Salmon and Designated Critical Habitat

Restricting in-water construction activities to June 15–October 15 avoids the primary migration periods of adult coho salmon. This period also avoids the most sensitive life stages (age 0+ fry) and the peak migration periods of emigrating coho juveniles (age 1+) (March–May) although emigrating juveniles may be present in the action area through June based on outmigrant trapping records in Mill Creek. As described in Section 4.4.2, *Status of SONCC Coho Salmon and Critical Habitat in the Smith River Watershed*, movements of YOY (age 0+) from their natal streams have been documented in spring and fall, resulting in redistribution of juveniles as they seek suitable summer and winter rearing habitat before emigrating to the ocean the following spring. In addition, juvenile coho salmon may occur in the action area during summer and thus are subject to exposure from in-water construction activities (installation and operation of clear water diversion) during the June 15–October 15 construction window.

5.2.1. Turbidity and Suspended Sediment

Construction activities that disturb soil and sediments in stream channels, riparian zones, and floodplains can increase erosion and mobilization of sediments, resulting in increased turbidity and suspended sediment in streams and potential adverse effects on aquatic species and their habitat. Proposed project activities that have the potential to cause turbidity and sedimentation impacts include disturbance of soil and vegetation adjacent to the creek, and disturbance of the streambed during instillation and removal of the clear water diversion (temporary barrier and flow bypass pipe), dewatering, and restoration of flow following construction.

Depending on the concentration and duration of exposure, suspended sediment can cause lethal, sublethal, and behavioral effects in fish (Newcombe and Jensen 1996). For salmonids, elevated turbidity and suspended sediment has been linked to a number of physiological and behavioral responses indicative of stress (Bisson and Bilby 1982; Sigler et al. 1984; Berg and Northcote 1985; Servizi and Martens 1992). High suspended sediment levels can cause gill trauma and impaired respiratory function. Very high levels can directly damage gill tissues, resulting in physical injury and even death. Behavioral effects include avoidance or abandonment of preferred habitat, changes in foraging ability, and increased predation risk.

Adult and juvenile salmonids are adapted to high concentrations of suspended sediment that occur during normal storm and runoff events. However, adults have been reported to cease migration or avoid their natal streams under extremely turbid conditions (Bjornn and Reiser 1991). High concentrations of suspended sediment and turbidity have also been reported to cause delays in the arrival of adults to spawning areas (Bjornn 1978; Quinn and Fresh 1984; Reid 1998; Mortensen et al. 1976; Bell 1991). Juveniles tend to avoid streams that are chronically turbid (Bisson and Bilby 1982; Lloyd 1987) or move laterally or downstream to avoid turbidity plumes (Sigler et al. 1984; Lloyd 1987; Servizi and Martens 1992).

Laboratory studies have demonstrated that chronic or prolonged exposure to high turbidity and suspended sediment levels can lead to reduced growth rates. For example, Sigler et al. (1984) found that juvenile coho salmon and steelhead trout exhibited reduced growth rates and higher emigration rates in turbid water (25–50

Nephelometric Turbidity Units) compared to clear water. Reduced growth rates generally have been attributed to an inability of fish to feed effectively in turbid water (Waters 1995). Chronic exposure to high turbidity and suspended sediment also may affect growth and survival by impairing respiratory function, reducing tolerance to disease and contaminants, and causing physiological stress (Waters 1995).

Increased sedimentation above natural levels can also result in modification of habitat such as filling of pools, filling of the interstitial spaces within the substrate, altering invertebrate communities (a primary food source for fish and other aquatic and terrestrial organisms), and adversely affecting the quality of spawning and rearing habitat. Fine sediment deposited in spawning gravel can reduce interstitial flow, reducing the oxygen supply to developing embryos and fry, and can prevent the emergence of fry from the gravel (Hicks et al. 1991). In addition to directly affecting salmonid survival, the filling of pools and interstitial spaces within the substrate can adversely affect rearing habitat and food abundance by reducing the amount of living space and cover for juveniles and benthic invertebrates (Bjornn and Reiser 1991, Hicks et al. 1991). Fine sediment in suspension can also affect the availability of food in streams by reducing primary production; increases in turbidity have been shown to reduce light penetration in both lakes and streams, resulting in decreased primary production, decreased abundance of food organisms (secondary production), and decreased production and abundance of fish (Lloyd et al. 1987).

During the in-channel construction season (June 15–October 15), short-term increases in suspended sediment and turbidity are anticipated to occur in the action area during construction activities. The greatest potential for temporary increases in turbidity and suspended sediment would exist during installation and removal of the clear water diversion. All other sediment-disturbing activities would be conducted above the active stream channel or in the dewatered portion of the creek following installation of the clear water diversion. Other potential sources of turbidity and suspended sediment include clearing and grubbing of existing vegetation and disturbance of the adjacent riparian zone to construct temporary access roads and staging areas. Clearing of vegetation and exposure of soil in these areas could result in increased erosion and delivery of sediment to the river, especially during subsequent storm and runoff events.

Application of the standard erosion and sediment control BMPs (see Section 3.5.2, *Best Management Practices to Protect Water Quality*) during construction and following each construction season is expected to minimize the potential for adverse effects of suspended sediment and turbidity on fish and aquatic habitat. Suspended sediment and turbidity levels that may be generated by construction activities and the duration of exposure are expected to be well below the thresholds for physiological stress in salmonids. In addition, the total volume of suspended sediment generated by construction activities is not expected to cause significant sediment deposition in holding areas (e.g., pools) or food-producing areas (e.g., riffles) downstream of the construction site. Small numbers of juvenile coho salmon that may be exposed to elevated turbidity and suspended sediment immediately downstream of in-water construction activities may be displaced from preferred habitat, resulting in brief disruptions in feeding and increased exposure to predation. However, these disruptions are unlikely to affect survival or growth because of the localized, temporary nature of the disturbance and availability of suitable habitat outside the affected areas.

5.2.2. Contaminants

Project actions that involve the storage, use, or discharge of toxic and other harmful substances near streams and other waterbodies (or in areas that drain to these waterbodies) could result in contamination of these waterbodies and potentially affect fish and other aquatic organisms. The operation of heavy equipment, drilling rigs, cranes, and other construction equipment in or near the creek can result in accidental spills and leakage of fuel, lubricants, hydraulic fluids, and coolants. Asphalt, wet concrete, and other construction materials may accidentally fall directly into the creek in surface water runoff; however, standard BMPs are expected to prevent this from occurring.

The potential magnitude of biological effects resulting from the accidental or unintentional discharge of contaminants depends on a number of factors, including the proximity of the discharge to waterbodies; the type, amount, concentration and solubility of the contaminant; and the timing and duration of the discharge. Contaminants can affect survival and growth rates, as well as the reproductive success of fish and other aquatic organisms. The level of effect depends on species and life stage sensitivity, duration and frequency of exposure, condition or health of individuals (e.g., nutritional status), and physical or chemical properties of the water (e.g., temperature, DO).

The potential exposure of coho salmon to contaminants and other harmful substances would be avoided or minimized through implementation of the standard construction site BMPs described in Section 3.5.2. Caltrans would require the contractor to prepare and implement a SWPPP and other construction site BMPs to control stormwater discharges and potential discharges of pollutants to Dominie Creek. These BMPs are designed to avoid and minimize the potential for accidental spills, minimize the extent and potential effects of accidental spills, and avoid and minimize the potential for contaminated runoff from waste materials. Implementation of the BMPs in accordance with an approved SWPPP or WPCP would substantially reduce or eliminate the potential for accidental spills or unintentional discharges of potentially hazardous materials to Dominie Creek and other adjacent streams, wetlands, and drainage channels.

Contaminants generated by traffic due to wear of tires, brake pads, and pavement as well as exhaust emissions and fluid leaks may be carried by stormwater runoff into receiving waters, resulting in chronic to acute effects on aquatic organisms depending on the concentration and duration of contaminant inputs. The proposed action is expected to result in 0.39 acres of impervious area after the action is completed, representing a net increase of 0.25 acres of new impervious area. To accommodate increases in stormwater discharge resulting from the added impervious area, the existing roadway and bridge drainage systems would be modified or replaced to provide adequate interception and retention of additional stormwater discharge volumes and rates. During construction, existing vegetated areas would be maintained to the maximum extent practicable. Post construction, new slopes and temporarily disturbed areas would be stabilized using erosion control products and vegetation planting. After construction, stormwater conveyance systems and permanent erosion control measures would be maintained in compliance with Caltrans' Storm Water Management Program. Stormwater would continue to drain to vegetated slopes, providing stormwater treatment in accordance with the Caltrans NPDES Permit.

With implementation of the proposed construction measures to minimize potential water quality and stormwater discharge impacts (Section 3.5.2), degradation of water quality from construction-related spills is unlikely, and any potential risk to individuals or critical habitat of SONCC coho salmon is expected to be minimal.

5.2.3. Noise and Visual Disturbance

General construction noise and vibrations (i.e., non-impulsive, continuous sources of noise below injury thresholds[6]), artificial nighttime light, and other physical disturbances can harass fish, disrupt or delay normal activities, or increase potential exposure or vulnerability to predators. The potential magnitude of effects depends on a number of factors, including the type and intensity of the disturbance, proximity of the action to the waterbody, timing of actions relative to the occurrence of sensitive life stages, and frequency and duration of activities. For most activities, the effects on fish would be limited to avoidance behavior in response to movements, noises, and shadows caused by construction personnel and equipment operating in or adjacent to the waterbody.

The potential for behavioral effects is expected to be highest in the immediate vicinity of the construction site where such disturbances would be most intense. Although juveniles are expected to respond by leaving or avoiding active construction areas, substantial uncertainty exists regarding their responses to specific stimuli, especially in natural settings. There is evidence that artificial lighting can affect the behavior of juvenile salmonids (Nightingale et al. 2006; Tabor et al. 2017). These studies indicate that localized, high-intensity lighting at night may attract juvenile salmonids and allow them to actively feed as they would during the day. Although this may be beneficial in terms of increased food consumption, it may increase the vulnerability of juvenile salmonids to predators such as piscivorous fish and birds.

Potential adverse effects on coho salmon from general construction noise and visual disturbance would be minimized through implementation of the standard measures identified in Section 3.5. In addition, the removal and relocation of any juveniles and exclusion of juveniles from the immediate construction area during operation of the clear water diversion (June 15–October 15) would minimize potential exposure of juveniles to artificial light and other visual or auditory disturbances. Any disturbances would likely be limited to activities that require work in the active stream (e.g., installation and removal of the clear water diversion). As a result, small numbers of juvenile coho salmon may respond by moving away from these disturbances, resulting in brief disruptions in feeding and increased exposure to predation. However, given the short duration of these disturbances and the availability of suitable habitat adjacent

[6] Potential impacts associated with impulsive noise sources (hoe rams) are addressed in Section 5.2.4, *Demolition Noise*.

to the affected areas, these activities are unlikely to have adverse effects on survival or growth. General construction noise and visual disturbance represents a temporary impact on the critical habitat of SONCC coho salmon.

5.2.4. Demolition Noise

Among the proposed construction activities, the use of hoe rams for demolition poses the greatest risk to fish because the levels of underwater noise produced by impulsive types of sounds, such as hoe rams, can reach levels of sufficient intensity to injure or kill fish (Popper and Hastings 2009). Other pile installation methods such as vibratory, oscillatory, and drilling methods (including proposed CIDH methods) generally produce more continuous, lower energy sounds below the thresholds associated with injury.

Hoe ramming and other impulsive types of anthropogenic noise have the potential to adversely affect fish through a broad range of behavioral, physiological, or physical mechanisms (McCauley et al. 2003; Popper and Hastings 2009). These effects may include behavioral responses, physiological stress, temporary and permanent hearing loss, tissue damage (auditory and non-auditory), and direct mortality depending on the intensity and duration of exposure. In salmonids and other fish species, the presence of a swim bladder to maintain buoyancy increases their vulnerability to direct physical injury (i.e., tissue and organ damage) from underwater noise (Hastings and Popper 2005). Underwater noise may also damage hearing organs and temporarily affect hearing sensitivity, communication, and ability to detect predators or prey (Popper and Hastings 2009). Underwater noise may also cause behavioral effects (e.g., startle or avoidance responses) that can disrupt or alter normal activities (e.g., migration, holding, or feeding) or expose individuals to increased predation (Voellmy et al. 2014; Simpson et al. 2016).

Factors that may influence the magnitude of effects caused by hoe ramming and other types of impulsive sounds include species, life stage, and size of fish; type and size of pile and hammer; frequency and duration of pile driving or demolition operations; site characteristics (e.g., water depth); and distance of fish from the source. Dual interim criteria representing the acoustic thresholds associated with the onset of physiological effects in fish have been established to provide guidance for assessing the potential for injury resulting from pile driving activities (Fisheries Hydroacoustic Working Group 2008) (Table 5-1). These criteria were established for impact pile driving but are used in the present analysis to evaluate potential acoustic impacts associated with hoe ram operations.

Table 5-1. Interim Criteria for Assessing the Potential for Injury to Fish from Pile Driving Activities

INTERIM CRITERIA	AGREEMENT IN PRINCIPLE
Peak Sound Pressure Level (SPL)	206 dB re: 1µPa (for all sizes of fish)
Cumulative Sound Exposure Level (SEL)	187 dB re: 1µPa2-sec (for fish ≥ 2 grams) 183 dB re: 1µPa2-sec (for fish < 2 grams)

Source: Fisheries Hydroacoustic Working Group 2008

The dual criteria are (1) 206 decibels (dB) for peak SPL; and (2) 187 dB for cumulative SEL for fish larger than 2 grams, and 183 dB SEL for fish smaller than 2 grams. The peak SPL threshold is considered the maximum SPL a fish can receive from a single strike without injury. The cumulative SEL threshold is considered the total amount of acoustic energy that a fish can receive from single or multiple strikes without injury. The cumulative SEL threshold is based on the total daily exposure of a fish to noise from sources that are discontinuous (in this case, noise that occurs up to 12 hours a day, with 12 hours between exposures). This assumes that fish are able to recover from any effects during this 12-hour period.

In the following analysis, the potential for injury to fish from exposure to underwater noise generated by hoe ram operations was evaluated using a spreadsheet model developed by NMFS to calculate the distances from the pile that sound attenuates to the peak or cumulative criteria. These distances define the area in which the criteria are expected to be exceeded. The NMFS spreadsheet calculates these distances based on estimates of the single-strike sound levels (measured at 10 meters [33 feet] from the source) and the rate at which sound attenuates with distance. To account for the exposure of fish to multiple strikes, the model computes a cumulative SEL for multiple strikes based on the single-strike SEL and the number of strikes per day or pile driving event. The NMFS spreadsheet also employs the concept of “effective quiet”. This assumes that cumulative exposure of fish to sounds of less than 150 dB SEL does not result in injury. Insufficient data are currently available to support the establishment of a noise threshold for behavioral effects (Popper et al. 2006). For consultation purposes, NMFS generally assumes that a noise level of 150 dB root mean square (RMS) is an appropriate threshold for behavioral effects.

A hoe ram would likely be used to demolish the existing concrete headwalls and box culvert. There are limited data for assessing underwater noise levels resulting from the operation of hoe rams. There are several Caltrans projects and one Washington Department of Transportation project where underwater noise monitoring was conducted during demolition of bridge piers. This information was summarized in a technical advisory prepared by ICF for Caltrans in July 2016. This technical advisory provides the latest available information on how to address noise impacts from demolition operations that use hoe rams.

Table 5-2 shows the computed distances to the injury and behavioral thresholds for hoe ram operations.[7] The reference data used in the analysis was a peak SPL of 176 dB, an RMS of 164, and an SEL of 154 dB.[8] These levels are based on sound levels measured during hoe ram operations for the Mad River Bridge Replacement Project. For the Mad River project, hoe ram activity took place on land approximately 17 meters (56 feet) from water and sound levels were measured approximately 10 meters (33 feet) in the river for a total distance of 27 meters (89 feet). Based on a 10-hour shift in which hoe ram operations resulted in a total of 11,669 bows, the cumulative SEL was 181 dB.

Table 5-2. Estimated Distances to Injury and Behavioral Thresholds for Demolition of Box Culvert and Headwalls

LOCATION	DISTANCE TO 206 DB PEAK CRITERIA (FEET)	DISTANCE TO 187 DB CUMULATIVE SEL CRITERIA (FEET)[1]	DISTANCE TO 183 DB CUMULATIVE SEL CRITERIA (FEET)[1]	DISTANCE TO 150 DB RMS CRITERIA (FEET)
Southbound Lane Culvert and Headwall	No impact	<89[1]	<89[1]	262[2]
Northbound Lane Culvert and Headwall	No impact	<89[1]	<89[1]	262[2]

[1] Estimates based on the computed distance to effective quiet (150 dB SEL)

[2] Limited by bends in creek

Peak SPLs during demolition activities are not expected to exceed the 206 dB noise threshold. With the clear water diversion in place, the distance of demolition activities

[7] See Caltrans (2018a) for additional details regarding the source data and assessment methods.

[8] The reference SEL levels for hoe ram operations represent average levels for blows with a single strike SEL of 150 dB or greater (i.e., blows resulting in SELs of less than 150 dB were excluded). RMS level not measured; RMS levels were estimated by adding 10 dB to the SEL.

from the upstream and downstream limits of the clear water diversion would be approximately 240 and 100 feet, respectively. Consequently, cumulative SELs that reach the active stream are expected to be well below the injury criteria based on the estimated distances to the 187 and 183 dB cumulative SEL criteria (Table 5-2). However, sound levels exceeding the 150 dB RMS threshold could occur up to 262 feet away from demolition activities, potentially affecting fish within 22 feet upstream of the temporary diversion dam and 162 feet downstream of the bypass pipe outlet.

ASSESSMENT OF IMPACTS ON FISH

The proposed timing of demolition activities (June 15–October 31) would avoid the peak adult and juvenile migration periods of coho salmon and other salmonids. However, rearing juveniles may occur in the action area through the summer. Based on the previous analysis, the implementation of the clear water diversion and the removal, relocation, and exclusion of fish from the temporary bypass reach (prior to dewatering and demolition activities) would effectively eliminate the risk of direct injury from exposure to demolition noise. The effects on fish would be limited to potential behavioral effects within 22 and 162 feet of the upstream and downstream limits of the clear water diversion. This could result in the disruption of normal activities (feeding or sheltering) of juveniles within these reaches. However, the potential for adverse effects on survival and growth is considered minimal given the temporary nature of demolition activities and the availability of suitable habitat outside the affected areas. In addition, Caltrans proposes to limit demolition activities to daylight hours to minimize any avoidance behavior that might prevent fish from moving downstream (through the bypass pipe).

5.2.5. Direct Injury

The potential exists for fish to be injured or killed during in-channel construction activities. Potential mechanisms include fish being impinged or crushed during installation of the temporary clear water diversion or stranded during dewatering operations. Restricting these activities to June 15–October 15 would avoid the most sensitive life stages (fry) and peak juvenile emigration periods but would result in some risk to juveniles that remain in the action area through the summer. The potential for harm is highest during dewatering operations when juveniles may become isolated and unable to return to the active stream. To minimize the risk of injury or mortality, Caltrans proposes to implement fish capture and relocation measures (see Section 3.5.3, *Aquatic Species Relocation Plan*) prior to the completion of dewatering operations, subject to determination of appropriate measures by a qualified fish biologist.

While fish relocation can be an effective protective measure, the potential exists for unintentional injury or mortality during capture, handling, and release depending on the method used, stream conditions, and the expertise and experience of the field crew. Fish-collecting gear, whether passive or active, poses some risk to individual fish, including stress, disease transmission, injury, or death. In addition, relocated fish may be subject to increased predation risk or impaired growth because of competition with other fish and displacement to less favorable habitat (Hayes et al. 1996; Keeley 2003; Ward et al. 2007). Data on fish relocation efforts from clear water diversion activities since 2004 shows that average mortality rates are generally below three percent for salmonids (Collins 2004; Hurlburt 2013). Given the measures that would be implemented to minimize adverse effects (see Section 3.5.3), Caltrans expects no more than three percent of all relocated fish would be subject to potential injury or mortality.

5.2.6. Fish Passage

During the June 15–October 15 in-channel construction period, the entire surface flow of Dominie Creek would be diverted via a plastic pipe (size to be determined) that would extend through the existing culvert approximately 410 linear feet from the upstream to the downstream construction limits. The presence of the clear water diversion would preclude upstream fish migration. Restricting the clear water diversion to June 15-October 15 would avoid the primary adult and juvenile migration periods of coho salmon and other anadromous salmonids. However, a small proportion of age 1+ or older juveniles may migrate through the action area through June, and some downstream movements of age 0+ juveniles may occur through the summer. Both upstream and downstream movements of juvenile coho salmon and other salmonids have been documented during summer in other small coastal streams (e.g., Kahler et al. 2001). However, the temporary blockage of upstream movements by the clear water diversion is not considered an adverse effect because of poor passage conditions for both juvenile and adult salmonids that currently exist at the box culvert and outlet weir (Lang 2005). Although downstream passage for juvenile coho would be maintained, juveniles that migrate through the action area after installation of the diversion would encounter altered physical and hydraulic conditions associated with the presence of the temporary diversion structure. Redirecting the entire flow of

Dominie Creek into the culvert would force migrating juveniles to pass through the culvert and reenter the creek where faster water and turbulence may disorient them. Studies have demonstrated that dams, weirs, and other artificial structures can substantially increase passage mortality of juvenile salmonids due to disorientation of juveniles and increases in predator holding habitat and feeding efficiency (Sabal et al. 2016). The predation risk in Dominie Creek is unknown but may be heightened as juveniles exit the diversion pipe, especially at night when daily movements of migrating juvenile coho salmon typically peak (Sandercock 1991). However, given the measures to limit the use of lights to active construction areas (thus avoiding illuminating the inlet and outlet areas of the clear water diversion), the risk of predation is considered negligible.

5.2.7. Habitat Impacts

The proposed project would result in temporary impacts on riparian and in-channel habitat from the removal of riparian vegetation, dewatering of the stream channel, and reconstruction of the stream channel. These constitute adverse effects on the designated critical habitat of SONCC coho salmon, including the physical and biological features (primary constituent elements) that support adult migration corridors, juvenile summer and winter rearing areas, and juvenile migration corridors.

RIPARIAN VEGETATION

Riparian vegetation directly influences the quality of salmonid habitat, providing several important habitat attributes and functions, including bank stabilization, shade, cover, velocity refuge, water quality functions, and food and nutrient inputs (Murphy and Meehan 1991; Doloff and Warren 2003). Riparian vegetation and woody debris are often the principal sources of cover for juvenile salmonids in streams, providing shelter during high flows, hiding and escape cover from predators, and preferred feeding stations (Bjornn and Reiser 1991). Numerous studies indicate a positive relationship between the amount of cover in streams and the survival and production of juvenile salmonids (Hicks et al. 1991; Reeves et al. 1989; Everest et al. 1987; Platts 1974). Riparian vegetation is also important to stream ecosystems because of its role in moderating stream temperatures, moderating storm flows, and filtering sediment and contaminants from storm-generated runoff.

Clearing of riparian vegetation to permit access to the creek and reconstruct the channel and banks would result in the temporary loss of approximately 0.6 acre of riparian vegetation. Caltrans proposes to mitigate onsite for temporary impacts on riparian vegetation by implementing a revegetation and monitoring plan. The objective of this plan would be to restore onsite riparian habitat at a minimum ratio of 1:1 subject to the final permitting requirements and coordination with the resource agencies to ensure no net loss of riparian function (see Section 3.5.8, *Revegetation, Plant Establishment, and Invasive Weed Control*).

Losses of riparian vegetation would result in reductions in shade, food availability, and other habitat functions within the project footprint, resulting in temporary adverse effects on the designated critical habitat of coho salmon. Although losses in riparian habitat would continue until riparian cover is fully restored, these losses comprise a small fraction of the total riparian habitat in Dominie Creek. Consequently, the temporary losses of riparian habitat are not likely to have significant effects on the overall quantity or quality of rearing habitat available to juvenile coho salmon and other salmonids in the creek. Moreover, improved passage conditions and restored access to habitat above the existing culvert following completion of the project would result in a substantial increase in the availability of habitat to coho salmon and other salmonids in Dominie Creek.

In-Channel Habitat

Installation of the temporary clear water diversion would result in temporary loss of approximately 6,600 square feet (0.15 acre) and 440 linear feet of stream habitat (excluding the culvert) for up to 4 months (June 15–October 15) during each construction season. The placement of the diversion during the June 15–October 15 construction periods would result in reductions in summer rearing habitat for two consecutive seasons through the loss of physical habitat (space), substrate, and food producing areas (macroinvertebrate production). The effects on physical habitat would be temporary because flow would be restored to the dewatered channel between construction seasons and permanently restored following completion of the project. The effect on food production is also expected to be short-lived due to rapid recolonization of the streambed by macroinvertebrates following construction. During construction, food production from upstream sources (drifting macroinvertebrates) to the reach downstream of the dewatered channel would be maintained by the clear water diversion. Although physical and hydraulic conditions within the footprint of the constructed channel would be permanently modified, the proposed channel (roughened channel) would be designed to function similarly to a natural channel and provide broad range of substrate sizes and hydraulic conditions over a wide range of flows to restore upstream and downstream passage conditions for adult and juvenile coho salmon and other salmonids. Consequently, the temporary adverse effects on in-channel habitat resulting from construction would be minor and outweighed by long-term beneficial effects on fish passage and restoration of access to spawning and rearing habitat upstream of the project site.

Chapter 6. Cumulative Effects

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BA. Future federal actions that are unrelated to the proposed action are not considered in this chapter because they require separate consultation pursuant to Section 7 of the ESA.

Major activities identified as responsible for the decline of coho salmon in the watershed include logging, mining, road construction, irrigation, dams, and habitat modification (National Marine Fisheries Service 2014). Future private, tribal, local, and state activities occurring at similar levels to those in the past are anticipated. Caltrans anticipates that routine maintenance activities such as minor tree and shrub trimming and clearing of highway shoulders to occur as necessary to keep woody debris and other materials off the highway for motorist safety. These activities would occur outside of any anadromous stream and would not affect anadromous fish species and their habitat. These activities and the proposed action are not expected to have a negative effect on water quality within the action area watercourses.

Chapter 7. Determination

7.1. Listed Species

The proposed action *may affect* and *is likely to adversely affect* SONCC coho salmon.

7.2. Designated Critical Habitat

The proposed action *may affect* and *is likely to adversely affect* the designated critical habitat for SONCC coho salmon.

Chapter 8. Essential Fish Habitat Assessment

8.1. Action Agency

Caltrans under NEPA Assignment

8.2. Regulatory Background

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may adversely affect EFH for those species regulated under a federal fisheries management plan. Under Section 305(b)(4) of the MSA, NMFS is required to provide EFH conservation recommendations to federal and state agencies for actions that would adversely affect EFH (50 CFR 600.925). NMFS makes its recommendations with the goal of avoiding, minimizing, or otherwise compensating for adverse effects to EFH. When impacts on NMFS trust resources are unavoidable, NMFS may recommend compensatory mitigation to offset those impacts. In order to fulfill its consultative role, NMFS may also recommend, among other things, the development of mitigation plans, habitat distribution maps, surveys and survey reports, progress milestones, monitoring programs, and reports verifying the completion of mitigation activities (National Marine Fisheries Service 2014).

The objective of this EFHA is to determine whether the proposed action "may adversely affect" designated EFH for relevant commercial, federally managed fisheries species within the proposed action area. It also describes conservation measures proposed to avoid, minimize, or otherwise offset potential adverse effects on designated EFH resulting from the proposed action.

EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (67 FR 2343). "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem;

and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle (50 CFR 600.10).

Freshwater EFH for Pacific Coast salmon consists of four major components: (1) spawning and incubation; (2) juvenile rearing; (3) juvenile migration corridors; and (4) adult migration corridors and holding habitat. Freshwater EFH depends on lateral (e.g., floodplain, riparian), vertical (e.g., hyporheic) and longitudinal connectivity to create habitat conditions for spawning, rearing, and migration including: (1) water quality (e.g., DO, nutrients, temperature); (2) water quantity, depth, and velocity; (3) riparian-stream-marine energy exchanges; (4) channel gradient and stability; (5) prey availability; (6) cover and habitat complexity (e.g., LWD, pools, aquatic and terrestrial vegetation, etc.); (7) space; (8) habitat connectivity from headwaters to the ocean (e.g., dispersal corridors, floodplain connectivity); (9) groundwater-stream interactions; and 10) substrate composition (Appendix A of Pacific Fishery Management Council 2014).

Additionally, the implementing regulations for EFH provisions (50 CFR 600) include specific types or areas of habitat within EFH known as Habitat Areas of Particular Concern (HAPC). Five HAPCs have been designated for Pacific salmon: (1) complex channels and floodplain habitats; (2) thermal refugia; (3) spawning habitat; (4) estuaries; and (5) marine and estuarine submerged aquatic vegetation.

The Smith River and its tributaries supports EFH for species regulated under the Federal Pacific Coast Salmon FMP, specifically coho salmon and Chinook salmon. The physical and biological features identified in this BA for coho salmon critical habitat are essentially the same as the EFH elements for both coho and Chinook salmon. Dominie Creek supports spawning and incubation, juvenile rearing, juvenile and adult migration habitat, and HAPCs for Pacific salmon, including thermal refugia for juvenile salmonids.

Only Pacific Salmon EFH occurs in the action area. Caltrans expects no impact on the quality or quantity of EFH for marine species that may use the Smith River estuary; additionally, the head of the tide is downstream of the action area. The status of SONCC coho salmon and critical habitat is presented in Section 4.4.2. The status and life history of Chinook salmon in the Smith River and action area is summarized in the following sections.

8.3. Description of the Proposed Action

The proposed action is described in Chapter 3, *Description of Proposed Action*.

8.4. Potential Adverse Effects of the Proposed Action

The regulatory guidance that implements the EFH provisions of the MSA (50 CFR 600) defines an “adverse effect” as any impact that reduces quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of EFH and may comprise site-specific or habitat-wide impacts including individual, cumulative, or synergistic consequences of actions.

8.4.1. Status and Life History of Chinook Salmon in Dominie Creek

Chinook salmon in Dominie Creek are part of the SONCC ESU of Chinook salmon. Most exhibit a fall-run life history with adults migrating to natal streams in the fall and spawning shortly after arriving on the spawning grounds, and juvenile emigrating within several weeks of emergence. Based on angler surveys and counts of returning adults at Rowdy Creek Hatchery (reported by Larson & Associates 2013), returning adult Chinook salmon begin their upstream migration in early fall with most migrating through the lower Smith River and action area from October through December. Spawning generally occurs from late November through January based on monitoring of live adults, carcasses, and redds in the Mill Creek basin (Garwood and Larson 2014; Walkley and Garwood 2017). Spawning habitat occurs in tributaries, including above the action area, and in the middle and upper reaches of the Smith River watershed (Walkley and Garwood 2017). Spawning has been reported in the action area (Garwood and Larson 2014).

Fry emergence generally occurs from February through mid-April (Leidy and Leidy 1984). Juvenile Chinook salmon exhibit a diversity of rearing and emigration patterns although most emigrate from natal streams in winter and spring (February through June) with smaller numbers rearing through summer and fall. Following emigration, SONNC Chinook salmon often exhibit extended rearing in estuaries (Healey 1991). In the Smith River estuary, relatively high densities were observed rearing in the lower and upper portions of the estuary from May through October (Quinones and Mulligan 2005) and juveniles have been detected in Dominie Creek (in or near the action area) through summer (Walkley and Garwood 2017).

The SONCC Chinook salmon ESU was proposed for federal listing in 1999 but listing was determined to be not warranted. No long-term records of basin-wide Chinook salmon abundance are available for the Smith River. Annual estimates of spawner abundances were estimated by the California Department of Fish and Game to be around 15,000 in the 1960s although this estimate was based on little or no data (Moyle et al. 2008). Monitoring of Chinook salmon escapement in Mill Creek basin (West Branch Mill Creek and Rock Creek) from 1994 and 2009 shows annual variability in escapement but no long-term trends (McLeod & Howard 2010). Sonar-based (DIDSON) counts of adult salmonids (apportioned into species using ancillary data sources) migrating past the monitoring station in the lower Smith River in 2010 and 2011 resulted in estimates of 17,973 and 19,197 Chinook salmon, respectively (Larson & Associates 2013).

8.4.2. Effects on EFH

Effects of the proposed action on Pacific Coast salmon EFH would be similar to the effects of the action on SONCC coho salmon critical habitat discussed in Chapter 5, *Effects of the Action*. In summary, potential effects include: (1) temporary effects on individuals and reductions in water quality from construction-related increases in turbidity, suspended sediment, and contaminant exposure risk, (2) temporary effects on individuals and habitat quality from general construction noise and visual disturbance, (3) temporary effects on individuals and habitat quantity and quality from installation of the clear water diversion, (4) temporary effects on individuals and habitat quality from demolition noise, and (5) temporary reductions in riparian vegetation and (6) permanent changes in physical and hydraulic conditions from stream channel and bank stabilization. Based on the analysis of effects in Chapter 5, the proposed action would adversely affect Pacific Coast salmon EFH. These effects would occur largely during June 15–October 15 of the 2-year construction period. Longer-term effects on EFH would occur as result of the loss of riparian vegetation and permanent effects on the stream channel and banks due to channel and streambank stabilization measures. Caltrans proposes to mitigate onsite for impacts on riparian vegetation by using a biotechnical streambank design and implementing a mitigation monitoring plan to restore riparian habitat to pre-project conditions. Although physical and hydraulic conditions within the footprint of the new channel would be permanently modified, the proposed channel (roughened channel) would be designed to function similarly to a natural channel and provide broad range of substrate sizes and hydraulic conditions over a wide range of flows to restore upstream and downstream passage conditions for adult and juvenile coho salmon and other salmonids. Consequently, these modifications would result in long-term beneficial effects on Pacific Coast salmon EFH by improving fish passage and restoring access (longitudinal connectivity) to 1.6 miles of spawning and rearing habitat upstream of the project site.

8.5. EFH Conclusion

The proposed action *may adversely affect* EFH for species managed under the Pacific Coast Salmon FMP.

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

October 22, 2018 **Refer to NMFS No:** WCR-2018-10655

Jennifer Barber
Acting Branch Chief, Environmental—E-3 Branch
California Department of Transportation, District 1
P.O. Box 3700
Eureka, California 95502-3700

Re: Endangered Species Act Section 7(a)(2) Biological Opinion, and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Dominie Creek Fish Passage Project in Del Norte County, California (EA 01-0F3100)

Dear Ms. Barber:

Thank you for your letter of August 28, 2018, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the Dominie Creek Fish Passage Project, California Department of Transportation (Caltrans[1]) reference EA 01-0F3100. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action. This letter transmits NMFS' final biological opinion and EFH consultation for Caltrans' proposed Dominie Creek Fish Passage Project (Project).

Based on the best scientific and commercial information available, NMFS concludes that the action, as proposed, is not likely to jeopardize the continued existence of the Southern Oregon/Northern California (SONCC) coho salmon Evolutionarily Significant Unit (ESU). The action is also not likely to destroy or adversely modify designated critical habitat for the SONCC coho salmon ESU. NMFS expects the proposed action would result in incidental take of SONCC coho salmon. An incidental take statement is included with the enclosed biological opinion. The incidental take statement includes non-discretionary reasonable and prudent measures and terms and conditions that are expected to further reduce anticipated incidental take of SONCC coho salmon.

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[1]Pursuant to 23 USC 327, and through a series of Memorandum of Understandings beginning June 7, 2007, the Federal Highway Administration (FHWA) assigned and Caltrans assumed responsibility for compliance with Section 7 of the federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) for federally-funded transportation projects in California. Therefore, Caltrans is considered the federal action agency for consultations with NMFS for federally funded projects involving FHWA. Caltrans proposes to administer federal funds for the implementation of the proposed action, and is therefore considered the federal action agency for this consultation.

The enclosed EFH consultation was prepared pursuant to section 305(b) of the MSA. The proposed action includes areas identified as EFH for coho salmon and Chinook salmon, Pacific Salmon species managed under the Pacific Coast Salmon Fishery Management Plan. Based on our analysis, NMFS concludes that the project would adversely affect EFH for coho salmon and Chinook salmon; however, we have no EFH Conservation Recommendations at this time.

Please contact Dan Free, Northern California Office, Arcata, at (707) 825-5164 or via email at Dan.Free@noaa.gov if you have any questions concerning this section 7 consultation, or if you require additional information.

Sincerely,

Alecia Van Atta
Assistant Regional Administrator
California Coastal Area Office

Enclosure

cc: Lisa Embree, Caltrans, District 1, Eureka, CA
Dana York, Caltrans, District 1, Eureka, CA
Susan Leroy, Caltrans, District 1, Eureka, CA
Michael VanHattem, California Department of Fish and Wildlife, Eureka, CA
JoAnn Loehr, California Department of Fish and Wildlife, Eureka, CA
Copy to ARN File #151422WCR2018AR00176
Copy to CRON File

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response

Dominie Creek Fish Passage Project,
Del Norte County, California

NMFS Consultation Number: *WCR-2018-10655*

Action Agency: Caltrans

Table 1. Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species or Critical Habitat?	Is Action Likely To Jeopardize the Species?	Is Action Likely To Destroy or Adversely Modify Critical Habitat?
Southern Oregon/North California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*)	Threatened	Yes	No	No

Table 2. Essential Fish Habitat and NMFS' Determinations:

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	No

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By:

Alecia Van Atta
Assistant Regional Administrator
California Coastal Area Office

Date: *October 22, 2018*

Table of Contents

1 INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through NMFS' Public Consultation Tracking System. A complete record of this consultation is on file at the NMFS Northern California Office in Arcata, California.

1.2 Consultation History

NMFS provided pre-consultation technical assistance to Caltrans on the Dominie Creek Fish Passage Project (Project) as needed beginning August 2015, which included participating in site visits, meetings, and reviewing/commenting on the draft Biological Assessment (BA).

On August 28, 2018, Caltrans submitted the final August 2018 BA and requested initiation of formal consultation. NMFS reviewed the request and determined that the information was sufficient to initiate formal consultation for SONCC coho salmon and their designated critical habitat, as well as MSA EFH consultation.

On September 11, 2018, NMFS notified Caltrans via email that their request contained sufficient information, and that formal consultation had therefore been initiated on August 28, 2018.

On September 24, 2018, NMFS contacted Caltrans (Lisa Embree) via email seeking clarification regarding the size of piles and installation technique. Caltrans responded with clarifying information on September 27, 2018.

1.3 Proposed Federal Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). Federal action means any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by a Federal Agency (50 CFR 600.910).

Caltrans proposes to implement a fish passage improvement project on Dominie Creek by replacing a double concrete box culvert with an 80-foot-long, single-span precast slab bridge on U.S. Highway 101 (US 101) near the town of Smith River in Del Norte County, California. In addition, the stream channel below the bridge will be designed to match the new grade which is 2-feet lower than the existing grade. The new channel will be constructed as a "roughened channel" which provides grade control and a diversity of velocities which promote fish passage of juveniles and adults through higher than ideal grades. In this case, the grade will be at 3.75% which is higher than typical grades of less than 3% which are ideal for juvenile and adult coho salmon passage. The purpose of the project is to remove the existing fish passage barrier by constructing a new bridge and stream channel that would provide full passage for anadromous fish of all life stages, especially juvenile salmonids. The project is not intended to address any transportation needs nor designed to facilitate an increase in traffic.

The bridge would be built roughly on the existing alignment in two stages using half-width construction methodology, which eliminates the need for a temporary traffic crossing. The project is expected to be completed in two work seasons in 2020 and 2021. All construction work, including fish removal and installation of the clear water diversion, below the ordinary high water mark would be restricted to June 15 through October 15. A qualified biologist would monitor all in-stream construction activities, including dewatering activities and culvert demolition, to ensure adherence to all environmental permit conditions and avoidance and minimization measures.

SONCC coho salmon are also listed as threatened under the California Endangered Species Act (CESA). California Fish and Game Code Section 2081 (b) (2) requires that action agencies fully mitigate for take of CESA listed species. The proposed action is being implemented to address CESA mitigation requirements from the California Department of Fish and Wildlife (CDFW) for incidental take of coho salmon under CESA associated with the Dr. Fine Bridge Project (a Federal ESA consultation has not yet been conducted for the Dr. Fine Bridge Project). Mitigation under CESA for the likely mortality of sub-yearling juvenile coho salmon, as a result of implementing the Dr. Fine Bridge Project and the proposed action, is expected. Prior to any activities that could incidentally take SONCC coho salmon, Caltrans will submit documentation to show that sufficient funds have been allocated, acceptable to and approved by CDFW, in the Expenditure Authorizations for the proposed action and Dr. Fine Bridge Project to ensure implementation of all measures to minimize and fully mitigate the incidental take of state listed species resulting from construction of the proposed action and Dr. Fine Bridge Project. This documentation (i.e., written document provided by Caltrans), would identify specific minimization and mitigation components including compliance and effectiveness monitoring that are in accordance Fish and Game Code Section 2081 (b)(4) and Section 2081 (b)(2) to fully mitigate for take and the costs associated with Project components. Therefore, a 2080.1 consistency determination from CDFW is expected.

The proposed action is described in detail in Caltrans' BA for this project (Caltrans 2018). Project elements that may affect salmonids or critical habitat are discussed in detail below, while the remaining project description is incorporated by reference to Caltrans' BA.

1.3.1 Construction Staging and Access

Temporary roads for channel and bank stabilization work would access the channel from US 101. The designated storage area for vehicles, supplies, and construction equipment staging would occur in the parcel away from the stream on either side of US 101.

Water Diversion and Aquatic Species Relocation Plan

In order to protect salmonids from impacts that could occur due to construction access, construction and demolition noise, and the stream channel restoration, Caltrans proposes to relocate fish from areas of potential impact, and to dewater the stream where construction access is required. Installation of the temporary diversion dam and culvert pipe and fish relocation would be conducted on or after June 15. The diversion would be removed and the channel restored to pre-existing conditions prior to October 15.

Fish exclusion and relocation would likely be conducted using seining gear, electrofishing gear, and dip nets. Electrofishing for salmonids would comply with *Guidelines for Electrofishing Waters Containing Salmonids Listed under the Endangered Species Act* (NMFS 2000), and any seining or other capture and removal techniques would adhere to the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al. 2010).

A temporary stream diversion would be necessary during construction operations to provide a clean, dry work area and equipment access into the creek channel. A combination of plastic liner, gravel bags, a water bladder, or other clean, impermeable materials would be used to construct cofferdams approximately 100 feet downstream and 240 feet upstream of the bridge. Any water that seeps into the project area will be pumped to an upland area, where it will be allowed to infiltrate such that turbid waters do not enter surface waters. The diversion would be constructed in conformance with a Construction Site Dewatering and Diversion Plan, and an Aquatic Species Relocation Plan.

Dewatering drawdown would occur incrementally to allow capture and relocation of any fish not captured during initial efforts, and to avoid fish stranding. All salmonids removed from the work area would be relocated to nearby suitable habitat in Dominie Creek upstream of the diversion. If unexpected life stages are observed (i.e., adults or smolts), or if mortality of listed species exceeds the number predicted, all project activities shall cease and NMFS and CDFW shall be contacted immediately.

A hoe ram will be used to demolish the existing culverts which will likely result in exceedance of the 150 decibel level considered as the threshold for behavioral effects to salmonids upstream of the clear water diversion. Refer to the *Effects of the Action* section below for details of the hydroacoustic analysis.

The stream diversion will be removed after construction is complete. The site would be re-watered by first removing the temporary cofferdams at each end of the temporary culvert, and then removing the culvert.

Provisions for the Aquatic Species Relocation Plan would also include the following measures:

- The mesh on the fish exclusion screens will not exceed 0.25 inch measured diagonally.

- Screens will be inspected daily or more if needed.
- If the biological monitor detects fish above the screens that appear to be outmigrating the fish would be moved to upstream Dominie Creek by a qualified biologist.
- A Caltrans biologist, contractor supplied biologist, or environmental construction liaison would be present during all phases of in-stream construction to assist with relocation efforts as they arise.

Pile Installation

Caltrans proposes to install 24-inch cast-in-drilled-hole (CIDH) pilings which will not result in any hydroacoustic effects. The nearest pile would be constructed approximately 25-feet from the wetted channel. Temporary casings would be installed with oscillation and would stabilize the drill holes and then removed after concrete pouring. A drilling fluid slurry would be used to stabilize the drilled holes during drilling operations and placement of reinforcement cage and concrete. The expelled slurry would be contained and pumped into containers for off-site disposal. Containment, disposal, and spill prevention measures would be implemented as described in the SWPPP and Caltrans (2018).

Abutment and Superstructure

The abutments would be protected from scour by placement of approximately 440 cubic yards of one-quarter ton rock slope protection (RSP) covering an area of approximately 0.08 acre. RSP would be keyed in below the channel grade to account for potential scour during high discharge events. No piers or columns would be required in the channel. The project would not require falsework or trestles within the channel. The height of the bridge over the stream channel would be approximately 16 feet. The new bridge deck is designed to discharge stormwater into vegetated areas at either end of the bridge, rather than directly into the creek.

Stream Channel Restoration

The stream channel would be reconstructed as a “roughened channel’ for hydraulic transition corrections and fish passage. An approximately 200-foot-long channel simulates a natural stream channel with roughness elements to foster a heterogeneous velocity profile to facilitate juvenile and adult coho salmon passage and eliminate head-cutting of the channel would be constructed to re-establish a 3.75% percent channel grade. All channel materials would be cleaned to ensure it meets “fish rock” specifications

Approximately 200 feet of Dominie Creek streambank, which is currently reinforced with concrete sack revetment, would be removed and the streambank restored with RSP as a foundation under a bioengineered slope consisting of earthen fill and approved native plantings.

Disturbed Soil/Vegetation and New Impervious Surface

The Project’s total disturbed soil area is estimated to be 0.80 acre, represented by areas where construction activities (including staging and storage) would take place, ground would be disturbed, and vegetation would be cleared. The impervious surface area within the project area is currently 0.96 acre, and the projected post-project impervious surface area would be approximately 1.01 acres, for an increase of 0.05 acre.

Construction Phase Best Management Practices

Caltrans would require that project contractor(s) implement temporary construction phase best management practices (BMPs) throughout the project to control stormwater discharges and potential discharges of pollutants to surface waters. The Stormwater and Pollution Prevention Plan (SWPPP) would include a waste management section that provides procedural and structural BMPs for collecting, handling, storing, and disposing of wastes generated by project construction to prevent the accidental release of pollutants. The contractor would also be required to submit a Demolition and Debris Containment and Management Plan to the Caltrans Resident Engineer for approval. The approved plans must meet environmental regulations, permits, consultations, agreements, notices, and details of work as specified in the environmental applications.

Because project construction would be dynamic, the contractor would determine locations for implementing these BMPs. Adequate material quantities would be available to allow the contractor sufficient flexibility to implement the BMPs as needed. Construction site BMPs related to water quality include, but are not limited to, the following:

- Trash removal would occur daily.
- Prior to use, equipment must be checked daily and periodically during the day for leaks. Leaking equipment cannot be used until fixed.
- Before entering the job site, all equipment must be cleaned to remove external oil, grease, dirt, or mud.
- Equipment must be pressure washed prior to arrival on the project site and prior to leaving the project site. Only weed-free equipment is allowed in the action area.
- No equipment maintenance or fueling shall be done within 50 feet from any streambed or flowing stream. If it is not practical to move equipment (e.g., large cranes) for fueling or maintenance, the contractor will implement a plan that includes measures to prevent any pollutants from entering Dominie Creek.
- Temporary construction barrier fencing and/or flagging would be installed between the work area and environmentally sensitive areas to restrict access and prevent unnecessary disturbance.
- All heavy equipment would stay out of the channel unless the channel is dewatered or otherwise dry (see also Construction Site Dewatering and Diversion Plan).
- Placement of concrete or concrete slurry would be conducted in a dry or dewatered area (e.g., channel banks above the OHWM or within a dewatered cofferdam or stream channel) to prevent contact of wet concrete with flowing water (see also Construction Site Dewatering and Diversion Plan).

- Any spills or leaks from construction equipment (i.e., fuel, oil, hydraulic fluid, and grease) shall be cleaned up in accordance with the provisions in the SWPPP.
- Use of geo-synthetic fabric (e.g., plastic, filter fabric) barriers to

prevent the discharge of contaminants (e.g., sediment, oil and grease, etc.) when equipment is working adjacent to or over waterways.

- Perimeter control BMPs, such as fiber rolls, silt fencing, straw wattles, and gravel-bag berms, would be installed along the work and staging areas to control sediment in runoff from entering adjacent waters.
- Designated staging and fueling areas with appropriate perimeter control BMPs to prevent spills and non-stormwater discharges.
- Rain Event Action Plans would be prepared prior to any forecasted precipitation to ensure adequate stabilization of equipment, materials, and soils.
- If chemical contamination is detected, all project activities would cease and NMFS and permitting agencies would be contacted immediately. Project activities may resume only after regulatory agencies have reasonable assurances that chemical contamination has ceased.
- All waste (concrete, asphalt, etc.) generated during construction would be disposed of at a permitted disposal site.
- Vegetation reestablishment or other stabilization measures would be implemented on disturbed soil areas, per the erosion control plan, and soil disturbing work would be limited during the rainy season.

Provisions for Use of Artificial Light at Night

Artificial night lighting may be required for brief periods during operations that necessitate a full road closure (i.e., to move traffic lanes). The use of artificial lighting would be temporary and of short duration, likely no more than two nights and fewer than eight hours each occasion. Deflectors would be used to direct light away from the channels and focused specifically on the portion of the bridge actively under construction. Lighting on the bridges and near watercourses would be limited to critical need (i.e., due to accelerated work schedule to meet permit deadlines or reaching a critical juncture in work at a time when it would be infeasible to stop construction) to minimize the effects of artificial light on sensitive biological resources.

Revegetation, Plant Establishment, and Invasive Weed Control

Construction activity would occur primarily in an area with vertical banks currently barren of vegetation or with poor quality riparian vegetation and non-native species. After all construction materials are removed, the project area would be restored to a natural setting by grading, placing erosion control, and replanting with native species. A revegetation and monitoring plan would be developed that outlines methods that would be implemented to restore all areas temporarily impacted by construction. Replanting would be subject to a plant establishment period as defined by project permits, which would require Caltrans to adequately water plants, replace unsuitable plants, and control pests. Caltrans would also implement a program of invasive weed control in all areas of soil disturbance caused by construction to improve habitat for native species in and adjacent to disturbed soil areas within the project limits.

1.3.2 Interrelated and Interdependent Actions

"Interrelated actions" are those that are part of a larger action and depend on the larger action for their justification. "Interdependent actions" are those that have no independent utility apart from the action under consideration (50 CFR 402.02). No such actions are associated with the proposed action.

2 ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, each Federal agency must ensure that its actions are not likely to jeopardize the continued existence of endangered or threatened species, or adversely modify or destroy their designated critical habitat. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an opinion stating how the agency's actions would affect listed species and their critical habitats. If incidental take is reasonably certain to occur, section 7(b)(4) requires NMFS to provide an ITS that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures (RPMs) and terms and conditions to minimize such impacts.

2.1 Analytical Approach

This biological opinion includes both a jeopardy analysis and/or an adverse modification analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of" a listed species, which is "to engage in an action that would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02). Therefore, the jeopardy analysis considers both survival and recovery of the species.

This biological opinion relies on the definition of "destruction or adverse modification," which "means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features" (81 FR 7214).

The designation(s) of critical habitat for (species) use(s) the term primary constituent element (PCE) or essential features. The new critical habitat regulations (81 FR 7414) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting a ''destruction or adverse modification'' analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. In this biological opinion, we use the term PBF to mean PCE or essential feature, as appropriate for the specific critical habitat.

We use the following approach to determine whether a proposed action is likely to jeopardize listed species or destroy or adversely modify critical habitat:

- Identify the rangewide status of the species and critical habitat expected to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on both species and their habitat using an

"exposure-response-risk" approach.

- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors by: (1) Reviewing the status of the species and critical habitat; and (2) adding the effects of the action, the environmental baseline, and cumulative effects to assess the risk that the proposed action poses to species and critical habitat.
- Reach a conclusion about whether species are jeopardized or critical habitat is adversely modified.
- If necessary, suggest a RPA to the proposed action.

2.2 Rangewide Status of the Species and Critical Habitat

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section also helps to inform the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR 402.02. The opinion also examines the condition of critical habitat throughout the designated area, evaluates the conservation value of the various watersheds and coastal and marine environments that make up the designated area, and discusses the current function of the essential PBFs that help to form that conservation value.

2.2.1 Species Description and General Life History

Coho salmon have a generally simple 3-year life history. The adults typically migrate from the ocean and into bays and estuaries towards their freshwater spawning grounds in late summer and fall, and spawn by mid-winter. Adults die after spawning. The eggs are buried in nests, called redds, in the rivers and streams where the adults spawn. The eggs incubate in the gravel until fish hatch and emerge from the gravel the following spring as fry. These 0+ age fish typically rear in freshwater for about 15 months before migrating to the ocean. The juveniles go through a physiological change during the transition from fresh to salt water called smoltification. Coho salmon typically rear in the ocean for two growing seasons, returning to their natal streams as 3-year old fish to renew the cycle.

2.2.2 Status of Species and Critical Habitat

In this biological opinion, NMFS assesses four population viability parameters to help us understand the status of each species and their ability to survive and recover. These population viability parameters are: abundance, population productivity, spatial structure, and diversity (McElhany et al. 2000). While there is insufficient information to evaluate these population viability parameters in a thorough quantitative sense, NMFS has used existing information, including the Recovery Plan for SONCC Coho Salmon (NMFS 2014) to determine the general condition of each population and factors responsible for the current status of the SONCC coho salmon ESU. We use these population viability parameters as surrogates for numbers, reproduction, and distribution, the criteria found within the regulatory definition of jeopardy (50 CFR 402.20).

SONCC Coho Salmon Abundance and Productivity: Although long-term data on coho salmon abundance are scarce, the available evidence from short-term research and monitoring efforts indicate that spawner abundance has declined since the last status review for populations in this ESU (Williams et al. 2016). In fact, most of the 30 independent populations in the ESU are at high risk of extinction because they are below or likely below their depensation threshold, which can be thought of as the minimum number of adults needed for survival of a population.

SONCC Coho Salmon Spatial Structure and Diversity: The distribution of SONCC coho salmon within the ESU is reduced and fragmented, as evidenced by an increasing number of previously occupied streams from which SONCC coho salmon are now absent (NMFS 2001, Good et al. 2005, Williams et al. 2011, Williams et al. 2016). Extant populations can still be found in all major river basins within the ESU (70 FR 37160). However, extirpations, loss of brood years, and sharp declines in abundance (in some cases to zero) of SONCC coho salmon in several streams throughout the ESU indicate that the SONCC coho salmon's spatial structure is more fragmented at the population-level than at the ESU scale. The genetic and life history diversity of populations of SONCC coho salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

SONCC Coho Salmon Critical Habitat Status: The condition of SONCC coho salmon critical habitat, specifically its ability to provide for conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human induced factors affecting critical habitat: overfishing, artificial propagation, logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered stream bank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality, lost riparian vegetation, and increased erosion into streams from upland areas (Weitkamp et al. 1995, 64 FR 24049, 70 FR 37160, 70 FR 52488). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

2.2.3 Factors Responsible for the Decline of Species and Degradation of Critical Habitat

The factors that caused declines include hatchery practices, ocean conditions, habitat loss due to dam building, degradation of freshwater habitats due to a variety of agricultural and forestry practices, water diversions, urbanization, over-fishing, mining, climate change, and severe flood events exacerbated by land use practices (Good et al. 2005, Williams et al. 2016). Sedimentation and loss of spawning gravels associated with poor forestry practices and road building are particularly chronic problems that can reduce the productivity of salmonid populations. Late 1980s and early 1990s droughts and unfavorable ocean conditions were identified as further likely causes of decreased abundance of SONCC coho salmon (Good et al. 2005). From 2014 through 2016, the drought in California reduced stream flows and increased temperatures, further exacerbating stress and disease. Ocean conditions have been unfavorable in recent years (2014 to present) due to the El Nino in 2015 and 2016. Reduced flows can cause increases in water temperature, resulting in increased heat stress to fish and thermal barriers to migration.

One factor affecting the range wide status and aquatic habitat at large is climate change.

Information since these species were listed suggests that the earth's climate is warming, and that this change could significantly impact ocean and freshwater habitat conditions, which affect survival of coho salmon subject to this consultation. In the coming years, climate change will influence the ability to recover coho salmon in most or all of their watersheds. Coho salmon and steelhead are particularly vulnerable to climate change due to their need for year-round cool water temperatures (Moyle 2002). Through effects on air temperatures and stream flows, climate change is expected to increase water temperatures to the detriment of coho salmon. Climate change effects on stream temperatures within Northern California are already apparent. For example, in the Klamath River, Bartholow (2005) observed a 0.5°C per decade increase in water temperature since the early 1960's, and model simulations predict a further increase of 1-2°C over the next 50 years (Perry et al. 2011).

In coastal and estuarine ecosystems, the threats from climate change largely come in the form of sea level rise and the loss of coastal wetlands. Sea levels will likely rise exponentially over the next 100 years, with possibly a 50-80 cm rise by the end of the 21st century (IPCC 2007). This rise in sea level will alter the habitat in estuaries and either provide increased opportunity for feeding and growth or in some cases will lead to the loss of estuarine habitat and a decreased potential for estuarine rearing. Marine ecosystems face an entirely unique set of stressors related to global climate change, all of which may have deleterious impacts on growth and survival while at sea. In general, the effects of changing climate on marine ecosystems are not well understood given the high degree of complexity and the overlapping climatic shifts that are already in place (e.g., El Niño, La Niña, Pacific Decadal Oscillation) and will interact with global climate changes in unknown and unpredictable ways. Overall, climate change is believed to represent a growing threat, and will challenge the resilience of coho salmon in Northern California.

2.3 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for the project encompasses the entire construction footprint that would be subject to ground disturbance and vegetation clearing, including the US 101 roadway and shoulders where staging and material storage may occur (i.e., temporary and permanent project limits). The action area includes the 410-foot section of Dominie Creek (240 feet upstream and 100 feet downstream of existing culvert, including the 70-foot culvert length) which will be dewatered during the two-construction seasons and undergo major changes to remove the culvert, install the bridge, and construct the roughened channel. Elevated turbidity levels are not expected to extend beyond Dominie Creek, so the action area will extend downstream only to the confluence with Rowdy Creek. Hydroacoustic noise levels associated with hoe ram demolition activities known to elicit behavioral responses in fish could occur in Dominie Creek within a 262-foot radius of the demolition (Caltrans 2018). These behavioral impacts would therefore extend approximately 22 feet upstream of and 162 feet downstream of the fish exclusion zone on Dominie Creek.

2.4 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR 402.02).

In the action area, the threat to SONCC coho salmon from climate change is likely to include a continued increase in average summer air temperatures; more extreme heat waves; and an increased frequency of drought (Lindley et al. 2007). In future years and decades, many of these changes are likely to further degrade habitat throughout the watershed by, for example, reducing streamflow during the summer and raising summer water temperatures. Many of these impacts will likely occur in the action area via reduced flows and higher water temperatures. However, due to the large areas of intact forest in the Dominie Creek watershed and restrictive conditions on timber harvest, and the action area's location in the coastal fog belt, the action area maintains low water temperatures throughout the summer. Therefore, the critical habitat in the action area has a very high conservation value for coho salmon into the future.

2.4.1 Status of Listed Species and Critical Habitat in the Action Area

Coho salmon occurring in the action area belong to the Smith River population of SONCC coho salmon. The Smith River population of SONCC coho salmon is considered likely to be below their depensation threshold (NMFS 2014), which can be thought of as the number of spawners needed for survival of the population. Dominie Creek is a tributary of Rowdy Creek, which is a tributary of the Smith River. The current numbers of coho salmon spawning in Rowdy Creek and Dominie Creek is not known. However, coho salmon spawning has been documented in the action area (Garwood and Larson 2012), although recent juvenile surveys have not found coho salmon in the action area (Walkley and Garwood 2017). Surveys conducted in 2012 documented juvenile coho salmon presence (Garwood 2012). Therefore, NMFS expects coho salmon to be only intermittently present in the action area and at very low numbers.

Critical habitat within Dominie Creek from just upstream of the culvert/bridge location and downstream to the confluence with Rowdy Creek has been channelized and simplified. This simplification of the creek has apparently caused channel incision and loss of instream complexity and pool habitat. The existing culvert is a complete barrier to juvenile coho salmon and a partial barrier to adult coho salmon. The Rowdy Creek Fish Hatchery is constructed immediately adjacent to Dominie Creek just above its confluence with Rowdy Creek and a large wall and concrete channel currently eliminates any functioning habitat for coho salmon juveniles or adults. Dominie Creek is a perennial tributary with cold water and functional riparian habitat upstream of the action area. Approximately 1.6 miles of coho salmon critical habitat with high intrinsic potential (Recovery Plan; NMFS 2014) exists upstream of the project location.

2.5 Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR 402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur.

2.5.1 Fish Relocation and Stream Diversion

Up to 410 linear feet of Dominie Creek (240 feet upstream and 100 feet downstream of the culvert including the 70 foot culvert length) would be dewatered by diverting the stream flow during the work window for two construction seasons. The diversion would be installed on or after June 15 and be removed prior to October 15. This measure avoids the late fall-winter migration period for adult salmon that may pass through the project area to spawn in most years, and the spring-early summer smolt out-migration. The diversion would, however, be constructed and remain in place during the period when juvenile salmonids may utilize the waters for summer rearing. Stream diversion and dewatering will require fish capture and relocation.

Fish Relocation

Removing fish from the temporary construction area in Dominie Creek is expected to significantly reduce the number of fish potentially injured or killed during the summer work season. In the absence of fish relocation, juvenile salmonids would be exposed to dewatering, thermal stress, desiccation, and physical injury from construction equipment. These exposures would likely kill them. However, while fish relocation substantially avoids impacts from construction, fish relocation activities themselves can injure or even kill fish. The amount of unintentional injury or mortality attributable to fish removal varies widely depending on the method used, ambient conditions, and the expertise and experience of the field crew. Fish collecting gear, whether passive or active poses some risk to individuals, including stress, disease transmission, injury, or death (Hayes et al. 1996). In addition, relocated fish may have to compete with other fish for available resources such as food and habitat, and the growth rate of fish can be slowed when population density is high (Ward et al. 2007).

Based on the results of various studies of salmonid seasonal occupancy and densities, as well as consideration of the quality of habitat in the action area (see Environmental Baseline section), NMFS expects that no more than 100 juvenile coho would be captured and distributed to suitable habitat in Dominie Creek over the two year construction period (i.e., 50 per year). The expected number of relocated juvenile coho, relative to available habitat, would not be expected to substantially contribute to overcrowding or increased competition to a level that would decrease their overall survival.

Mortality of Fish Relocated

Data on fish relocation efforts from water diversion activities since 2004 shows most average mortality rates are below three percent for salmonids. Given the measures that would be implemented to avoid and minimize impacts to fish during relocation efforts, NMFS expects no more than three percent of all relocated fish would be subject to potential injury or mortality. Applying the maximum mortality rate (3%) to the total number of juvenile salmonids that may be captured and relocated indicates that no more than three juvenile SONCC coho salmon would be injured or killed.

Stream Diversion

Adult salmonid migration and spawning, and smolt migration, are not likely to be affected because the diversion would be constructed after smolts have completed emigration from small tributaries such as Dominie Creek, and then removed prior to the onset of adult spawning migration. Passage of redistributing juveniles may be limited by the diversion; however, the proposed work windows minimize exposure and avoid peak timing of juvenile redistribution. Additionally, movements by adult and juvenile salmonids in Dominie Creek are currently restricted or prevented by low summer/early fall flows due to the partial culvert barrier. Therefore, NMFS does not expect the stream diversion to affect the fitness of any individuals, or to negatively influence the passage of any life stages of SONCC coho salmon.

2.5.2 Noise and Visual Disturbance

General Construction Noise and Visual Disturbance

Construction, demolition activities, and night lighting could cause behavioral responses and stress in juvenile salmon present during the in-stream work period of June 15 to October 15. However, the stream diversion and fish relocation efforts will exclude fish from the construction zone, so general construction noise and potential visual disturbance would be improbable apart from the work required to install the diversion and relocate the fish, which is analyzed above.

Impact Noise and Hydroacoustic Effects

Caltrans (2018) evaluated potential underwater noise levels generated by planned construction activities, and determined that demolition activities by hoe ram would not exceed acoustic noise thresholds known to cause injury to fish. However, juvenile salmonids could be exposed to underwater noise levels exceeding the behavior thresholds (150 decibels) without reaching the injurious cumulative sound exposure level (cSEL) threshold. Caltrans' analysis predicts that exposure to 150 decibel sound levels would occur over a radius of 262 feet. This radius would include up to 22 feet of Dominie Creek upstream and 162 feet downstream of the proposed fish exclusion area.

Temporary behavioral changes that fish may exhibit in response to pile driving noise include startling, altering behavioral displays, avoidance, displacement, and reduced feeding success. Observations of juvenile steelhead exposed to pile driving noise above the 150 decibels behavioral threshold at the Mad River Bridges US 101 project indicate that the fish quickly habituate to the noise and resume normal surface-feeding behavior within a few minutes of the fist pile strikes (Mike Kelly, NMFS, personal observation). Therefore, NMFS believes that periodic behavioral changes caused by sub-injurious sound exposure during the course of one week or less will not result in a decrease in fitness or survival of individual listed coho salmon.

2.5.3 Water Quality

Pollutants from construction operations, highway stormwater runoff, or from the mobilization of sediment and dust both during and after construction, all have the potential to impact water quality within the action area.

Turbidity and Sedimentation

Short term increases in suspended sediment and turbidity are anticipated during a number of Project-related activities. These activities include installation and removal of the stream diversion, worker access to the streambed, and fish relocation efforts. Additionally, there is likely to be an increase in suspended sediments and turbidity throughout the action area during the first rainfall of the season as disturbed sediments mobilize and adjust.

Increases in suspended sediment or turbidity can affect water quality, which in turn can affect fish health and behavior. Salmonids typically avoid areas of higher suspended sediment, which means they displace themselves from their preferred habitat in order to seek areas with less suspended sediment. Fish unable to avoid suspended sediment can experience negative effects from exposure.

Research has shown that length of exposure to total suspended solids (TSS) plays a more dominant role than TSS concentration (Anderson et al. 1996). Long term exposure to elevated TSS conditions may cause an endocrine stress response (elevated plasma cortisol, glucose, and hematocrits), suggesting an increased physiological burden that could influence growth, fecundity, and longevity (Redding et al. 1987). Therefore, when considering the effects of TSS on listed fish, it is important to consider the frequency and the duration of the exposure, not just the TSS concentration (Newcombe and Jensen 1996).

Activities that could produce the majority of potential suspended sediments will occur while the site is dry or de-watered, and salmonids would have been relocated outside of the work area and not exposed to turbidity. Removal of the stream diversion would be performed gradually to avoid potential stream sediment disturbance and transport. Adjustment of the channel during the first rains of the season will likely produce turbidity of short duration and low concentration, and will occur when the most vulnerable life stages are not present. Additionally, through project design and implementation of standard wet-weather BMPs, as described in detail in Caltrans' BA (Caltrans 2018), levels of suspended sediment and turbidity are expected to be controlled sufficiently to avoid exposing salmonids to injurious durations and concentrations. Therefore, NMFS considers the potential amounts and duration of turbidity generated by the proposed Project to be unlikely to reduce the fitness of listed salmonids in the action area.

Pollutants Associated with Stormwater Runoff and Spills

Contaminants generated by traffic, pavement materials, and airborne particles that settle may be carried by stormwater runoff into receiving waters. Stormwater runoff can introduce metals (e.g., copper, zinc, cadmium, lead and nickel) into waterways, where aquatic species can be affected. Copper and zinc are of particular concern due to their effect on salmonids at low concentrations. Dissolved copper and zinc in stormwater road runoff are difficult to remove, and have known negative effects on salmonids and other fishes (Sandahl et al. 2007).

However, the Project will not increase the amount of traffic in the action area, and as such the traffic-related contaminants are expected to remain similar to pre-project levels. Additionally, stormwater drainage at the new bridge is designed to discharge into vegetated areas at either end of the bridge, rather than directly into the creek. Therefore, reductions in fitness of individual listed salmonids residing in the action area due to toxic materials in stormwater runoff are not expected.

Accidental spills from construction equipment pose a significant risk to water quality, particularly for construction activities in or near watercourses, and at the onset of the rainy season when the first flush could trigger the discharge of spilled materials. However, in-stream activities would be suspended and all construction areas stabilized prior to the onset of the rainy season. Furthermore, the proposed minimization measures are expected to prevent chemical contamination during construction. Given the minimization measures and BMPs proposed, NMFS expects the likelihood of an accidental spill of contaminants reaching a waterway to be improbable.

2.5.4 Effects to Critical Habitat

NMFS expects long-term improvement to the quality and quantity of critical habitat due to the proposed action. The SONCC Coho Salmon Recovery Plan (Recovery Plan, NMFS 2014) lists barriers to fish passage as a moderate threat in the Smith River watershed. However, the Dominie Creek culvert at Highway 101 is considered a “high priority” because of the amount of habitat above the barrier (1.6 miles). Because of it’s perennially cold water, the Dominie Creek watershed is expected to provide valuable refugia, rearing, and spawning habitat for coho salmon and aid in coho salmon recovery with remediation of the fish passage barrier through this proposed action.

The Recovery Plan identifies “intrinsic potential” for specific reaches of streams. Intrinsic potential describes the potential of a reach of stream to support rearing juvenile salmonids regardless of the current condition of the stream reach. The Recovery Plan lists Dominie Creek as having reaches of high intrinsic potential for coho salmon (NMFS 2014). Given the length of habitat with high intrinsic potential that the project will make more readily accessible to juveniles (1.6 miles), the project is likely to have a positive impact on SONCC coho salmon recovery.

Streambanks and Streambed

Abutments for the new bridge will occupy portions of the natural streambank, resulting in an artificial setting with concrete or RSP instead of native bank materials. However, the bridge abutments and RSP are limited in spatial extent and occur only adjacent to the existing bridge and roadway. The majority of this area is already in an artificial setting and occupied by the current concrete box culvert. Placement of the new bridge will continue much of this artificial setting into the future, although impacts will likely be reduced because a natural streambed will replace the concrete culvert bottom, and the new channel width will provide more natural conveyance of water and debris. Because the proposed changes to the streambanks and channel in the action area represent an overall improvement compared to baseline condition, NMFS does not expect any reduction in the quantity or quality of designated critical habitat due to this project action.

Impervious Surface

As a result of the project, there would be an estimated 0.25-acre increase in impervious surface. New impervious surface has the potential to cause an increase in peak flow and higher runoff volumes that can lead to channel scouring and bank erosion which, in turn, can increase sediment and turbidity in receiving waters. It can also lead to decreased storage capacity and outflow efficiency, thereby negatively affecting floodplain processes that are important for salmonids. However, due to the relatively small amount of new impervious surface in a watershed that is almost entirely within old growth redwood forest, NMFS believes that no changes in peak flow or runoff volume would occur that could produce a meaningfully measurable impact to salmonid habitat.

Riparian Habitat

The riparian area adjacent to the existing culvert and stream channel is of low quality and dominated by Himalayan blackberry. The clear water diversion would be installed by manual labor by way of foot access and would not require riparian vegetation removal. Downstream of the new bridge, bank stabilization and stream channel restoration work would affect/remove several small willows, but the activity would occur primarily in an area with vertical banks currently barren of vegetation. After the bank stabilization work, habitat complexity and riparian vegetation should be improved.

The bridge work is expected to have minimal impact on the functional values of existing riparian habitat for coho salmon, and would be improved post-construction because of planting and removal of non-native vegetation. Given the small scale of the impact, the minimal temporal loss of riparian function, and the vegetative cover that would remain adjacent to the project site, no measurable increase in water temperature or reduction in the amount of terrestrial food input into the project area watercourses is anticipated. In addition, disturbed areas would be stabilized, and vegetation reestablished. Therefore, impacts to riparian vegetation are not expected to result in a reduction in the quality or quantity of critical habitat.

2.5.5 Combined Effects

The potential exists for simultaneous construction-related impacts to have a synergistic effect that is greater or different than each stressor acting alone. Simultaneous project impacts may include visual impacts from workers and equipment working near or over the watercourses at the same time when fish may be exposed to noise and vibration from construction equipment. Fish may also be exposed to noise and/or visual disturbances during minor increases in turbidity when the clear water diversion is removed. Most potential project impacts would not occur simultaneously due to logistics of bridge construction that require one phase of the project to be completed prior to starting another. For instance, removal of the concrete culvert or the clear water diversion would not occur simultaneously to abutment construction, thereby eliminating the potential compounding effects of those activities. Because combined effects are either unlikely or of very low intensity, NMFS does not expect any reductions in listed salmonid fitness from any combined effects of individual construction elements.

2.6 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Some continuing non-Federal activities are reasonably certain to contribute to climate effects within the action area. However, it is difficult if not impossible to distinguish between the action area's future environmental conditions caused by global climate change that are properly part of the environmental baseline *vs.* cumulative effects. Therefore, all relevant future climate-related environmental conditions in the action area are described in the environmental baseline (Section 2.4).

SONCC coho salmon in the action area are likely to be affected by future, ongoing non-federal activities like timber harvest. These activities are currently covered under an ESA Habitat Conservation Plan (HCP) which anticipates minor environmental baseline improvements primarily through improvements to the timber road network. This HCP has already undergone section 7 consultation so these effects have already been considered in the environmental baseline conditions.

2.7 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to species and critical habitat as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.5) to the environmental baseline (Section 2.4) and the cumulative effects (Section 2.6), taking into account the status of the species and critical habitat (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) Reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution; or (2) appreciably diminishes the value of designated or proposed critical habitat for the conservation of the species.

SONCC coho salmon have declined to a large degree from historic numbers. SONCC coho salmon have fragmented population structures, placing them at additional risk. As previously discussed in the effects of the action (Section 2.5), the Project will accomplish a recovery action from the Recovery Plan (NMFS 2014). Once completed, the Project will improve the status of critical habitat in the action area. The new bridge and roughened channel at Dominie Creek will improve fish passage, especially for juvenile coho salmon, and will accommodate improvements to the spatial structure and diversity parameters in the future. Fish habitat conditions will likely also improve within the action area due to the improved design of the new bridge, channel, and banks.

Due to the timing of the Project, adult salmon are not expected to be present, and would only be minimally affected if they were present. The abundance of juvenile coho salmon is expected to be very low, if they are present at all because of the current barrier condition. However, it is possible that coho salmon congregate below the barrier during and temporally overlap with the construction seasons. During fish relocation activities, as many as 100 individual juvenile SONCC coho salmon may be captured and relocated during the two seasons. NMFS expects that three individual juvenile coho salmon could be injured or killed during the fish relocation activities over the two-year construction period.

SONCC coho salmon present would likely make up a very small proportion of the salmonids in the Smith River population area due to the relatively small action area. Also, due to the relatively large number of juveniles produced by each spawning pair, spawning in the Smith River population area in future years would be expected to produce enough juveniles to replace any that are lost at the project site due to relocation. Therefore, it is unlikely that the loss of three juvenile coho salmon by this project would impact future adult returns.

The action area could be subject to higher average summer air temperatures and lower total precipitation levels in the future as a consequence of climate change. Higher air temperatures would likely warm stream temperatures. Reductions in the amount of precipitation would reduce stream flow levels and estuaries may also experience changes in productivity due to changes in freshwater flows, nutrient cycling, and sediment amounts. For this project, construction would be completed by 2020 and the above effects of climate change are unlikely to be detected within that time frame. The short-term effects of project construction would have completely elapsed prior to these climate change effects. The long-term changes in the channels at the bridge site are confined to small areas and are unlikely to significantly magnify the likely climate change impacts. Restoring full access to upstream rearing areas and high velocity refuge areas by removing this passage barrier is expected to increase the carrying capacity of the Dominie Creek watershed, which, because of its perennial cold water, could serve as a stronghold for juvenile salmonids in the face of climate change effects. Therefore, the project is unlikely to appreciably reduce the likelihood of survival and recovery of SONCC coho salmon.

2.8 Conclusion

After reviewing and analyzing the current status of the listed species and critical habitat, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of SONCC ESU of coho salmon, or destroy or adversely modify its designated critical habitat.

2.9 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this ITS.

2.9.1 Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take is reasonably certain to occur as follows:

Take of juvenile coho salmon in the form of capture is expected during fish relocation and diversion activities. Up to 100 juvenile coho salmon are expected to be captured and relocated during the two years of Project implementation. Because mortality resulting from relocation activities, including netting and electrofishing, is estimated to be about three percent; three juvenile coho salmon mortalities are expected.

2.9.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

2.9.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02).

NMFS believes the following reasonable and prudent measures are necessary and appropriate to minimize take of SONCC coho salmon:

- Undertake measures to ensure that harm and mortality to threatened coho salmon resulting from fish relocation and dewatering activities is low.
- Ensure construction methods, minimization measures, and monitoring are properly implemented during construction.
- Prepare and submit a post-construction report regarding the effects of fish relocation and construction activities.

2.9.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and Caltrans or any applicant must comply with them in order to implement the RPMs (50 CFR 402.14). Caltrans or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this ITS (50 CFR 402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement reasonable and prudent measure 1:
   a. Caltrans or their contractor shall submit to NMFS a Construction Site Dewatering Plan and an Aquatic Species Relocation Plan for approval a minimum of 30 days prior to implementing the plans.
   b. Qualified biologists with expertise in the areas of anadromous salmonid biology shall conduct fish relocation activities associated with construction. Caltrans will ensure that all biologists working on the project are qualified to conduct fish relocation in a manner which minimizes all potential risks to salmonids.
   c. Caltrans or their contractor performing fish relocation shall first use a seine to herd fish out of the work site, if practicable, before using electrofishing techniques. Herding fish out of the work site with a seine prior to electrofishing will reduce the number of fish exposed to electrofishing activities and reduce the number of fish captured and subject to risks of mortality. Herding fish by using an electrofisher shall not be attempted.
   d. Salmonids shall be handled with extreme care and kept in water to the maximum extent possible during rescue activities. All captured fish must be kept in cool, shaded, and aerated water protected from excessive noise, jostling, or overcrowding or potential predators any time they are not in the stream, and fish will not be removed from this water except when released. Captured salmonids will be relocated as soon as possible to an instream location in which suitable habitat conditions are present to allow for adequate survival for transported fish and fish already present. Fish will be distributed between multiple pools if biologists judge that overcrowding may occur in a single pool.
   e. Caltrans or their contractor shall monitor any screens used to block fish access on a daily basis, or more frequently if necessary, to ensure that no impingement occurs, and to assess whether significant downstream migration is occurring.

If downstream migrating fish aggregate at the screen(s), the qualified biologist will relocate these fish to suitable downstream habitat.

f. If any salmonids are found dead or injured, the biologist will contact NMFS biologist Dan Free by phone immediately at (707) 825-5164 or email at Dan.Free@noaa.gov. The purpose of the contact is to review the activities resulting in the take and to determine if additional protective measures are required. All salmonid mortalities will be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location, fork length, and be frozen as soon as possible. Frozen samples will be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS Northern California Office in Arcata, California without obtaining prior written approval from the South Coast Branch Chief. Any such transfer will be subject to such conditions as NMFS deems appropriate.

2. The following terms and conditions implement reasonable and prudent measure 2:
    a. Caltrans shall allow any NMFS employee(s) or any other person(s) designated by NMFS, to accompany field personnel to visit the project site during activities described in this opinion.
    b. Caltrans shall contact NMFS within 24 hours of meeting or exceeding take of listed species prior to project completion. Notify Dan Free by phone at 707-825-5164 or email at Dan.Free@noaa.gov. This contact acts to review the activities resulting in take and to determine if additional protective measures are required.
    c. If it is necessary to move additional outmigrating fish while monitoring exclusion screens, Caltrans will contact NMFS immediately to determine whether screens need to be removed to allow continued migration.

3. The following terms and conditions implement reasonable and prudent measure 3:
    a. Caltrans shall provide a written report to NMFS by January 15 of the year following construction of the project. The report shall be sent to NMFS via email to Dan.Free@noaa.gov or via mail to Dan Free at 1655 Heindon Road, Arcata, CA 95521. The report shall contain, at a minimum, the following information:
        i. **Construction related activities –** The report will include the dates construction began and was completed; a discussion of any unanticipated effects or unanticipated levels of effects on salmonids, a description of any and all measures taken to minimize those unanticipated effects and a statement as to whether or not the unanticipated effects had any effect on coho salmon; the number of coho salmon killed or injured during Project construction; and photographs taken before, during, and after the activity from photo reference points.
        ii. **Fish Relocation –** The report will include a description of the location from which fish were removed and the release site including photographs; the date and time of the relocation effort; a description of

the equipment and methods used to collect, hold, and transport salmonids; the number of fish relocated by species; the number of fish injured or killed by species and a brief narrative of the circumstances surrounding salmonid injuries or mortalities; and a description of any problems which may have arisen during the relocation activities and a statement as to whether or not the activities had any unforeseen effects.

2.10 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information (50 CFR 402.02). NMFS has no conservation recommendations to suggest.

2.11 Reinitiation of Consultation

This concludes formal consultation for the Dominie Creek Fish Passage Project. As 50 CFR 402.16 states, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental taking specified in the ITS is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion, or (4) a new species is listed or critical habitat designated that may be affected by the action.

3 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT ESSENTIAL FISH HABITAT RESPONSE

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect EFH. The MSA (section 3) defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH. Adverse effects on EFH may result from actions occurring within EFH or outside of it and may include site-specific or EFH-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). Section 305(b) also requires NMFS to recommend measures that can be taken by the action agency to conserve EFH.

This analysis is based, in part, on the EFH assessment provided by Caltrans and descriptions of EFH for Pacific Coast salmon (PFMC 2014) contained in the fishery management plans developed by the Pacific Fisheries Management Council (PFMC) and approved by the Secretary of Commerce.

3.1 Essential Fish Habitat Affected by the Project

Essential Fish Habitat is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]). "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means habitat required to support a sustainable fishery and a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle. The term "adverse effect" means any impacts which reduce the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrates and loss of, or injury to, benthic organisms, prey species, and their habitats, and other ecosystem components. Adverse effects may be site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.910). The EFH consultation mandate applies to all species managed under a Fishery Management Plan (FMP) that may be present in the action area.

There is suitable habitat for juvenile salmon rearing, and adult salmon spawning in Dominie Creek. Habitat Areas of Particular Concern (HAPC) are described as complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation. HAPCs exist in the action area as: spawning habitat and complex channel and floodplain habitat in Dominie Creek.

3.2 Adverse Effects on Essential Fish Habitat

Both Chinook salmon and coho salmon are expected to occur seasonally within the action area. The adverse effects to coho salmon and coho salmon critical habitat have already been described in the Effects section and would also apply to Chinook salmon. The adverse effects to EFH and HAPCs in the action area include:

1. Temporary reduction in habitat available during dewatering activities in Dominie Creek.
2. Noise and visual disturbance during construction activities.
3. Temporary reduction in water quality caused by increase in suspended sediments and turbidity during first rain events following construction.
4. Temporary loss of riparian and wetland vegetation.

3.3 Essential Fish Habitat Conservation Recommendations

The anticipated adverse effects from the proposed action are temporary and minor. The project is designed to improve habitat conditions and habitat availability. NMFS has determined that all desirable and feasible habitat improvements are incorporated into the proposed action. Therefore, NMFS has no EFH recommendations at this time.

3.4 Supplemental Consultation

Caltrans must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH Conservation Recommendations (50 CFR 600.920(l)).

4 DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

4.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended users of this opinion are Caltrans. Other interested users could include CDFW. A copy of this opinion was provided to Caltrans. This opinion will be posted on the Public Consultation Tracking System. The format and naming adheres to conventional standards for style.

4.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

4.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion and EFH consultation contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA and MSA implementation, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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Appendix H Environmental Commitments Record

Environmental Commitments Record for the Dr. Fine Bridge Replacement Project

In order to be sure that all of the environmental measures identified in this document are executed at the appropriate times, the following mitigation program (as articulated on the proposed Environmental Commitments Record [ECR] which follows) would be implemented. During project design, avoidance, minimization, and /or mitigation measures will be incorporated into the project's final plans, specifications, and cost estimates, as appropriate. All permits will be obtained prior to implementation of the project. During construction, environmental and construction/engineering staff will ensure that the commitments contained in this ECR are fulfilled. Following construction and appropriate phases of project delivery, long-term mitigation maintenance and monitoring will take place, as applicable. As the following ECR is a draft, some fields have not been completed, and will be filled out as each of the measures is implemented. Note: Some measures may apply to more than one resource area. Duplicative or redundant measures have not been included in this ECR.

Environmental Commitment Record for the Dr. Fine Bridge Replacement Project

Task and Brief Description	Responsible Branch / Staff	Timing / Phase
Measures to Avoid or Minimize Non-significant Impacts		
Access-1: River Access and Signage. Existing pedestrian access to the Smith River at the south side of the Dr. Fine Bridge will continue after project completion. Vehicular access will be prohibited to prevent illicit dumping and restore vegetation. A sign will be posted at this location providing information about nearby vehicular access and boat launching points. Additionally, Caltrans will work with CDFW to improve signage along Fred D. Haight Drive directing recreation users to the existing CDFW Smith River Public Fishing Access, located less than 1 mile downstream of the bridge. Caltrans will also coordinate with the Coastal Commission, CDFW and Del Norte County on possible enhancements that can be made at the CDFW Smith River Public Fishing Access.	Resident Engineer (RE), Environmental Construction Liaison (ECL)	During/ Post Construction
Visual-1: Boulders on South Bank Road. Boulders placed on the south bank to inhibit vehicular access from South Bank Road would match the color of existing stone within the project area to blend with the natural surrounding environment.	RE	During/ Post Construction
Visual-2: Screen Nearby Residences. Nearby residences would be screened from views of the highway and retaining walls by planting native trees and shrubs. The traveling public would be screened from views of the quarry by planting native trees and shrubs.	Landscape Architect	During/ Post Construction
Visual-3: Color galvanized steel bridge railings. Consider a unique color that would enhance visual character and memorability of the bridge or a color that blends in with the surrounding scenic landscape.	RE	During/ Post Construction
Visual-4: Retaining Walls. For Alternative 3, include architectural treatment, such as a relief pattern, on any solid concrete barrier in front of the retaining walls. The treatment should be context sensitive and take into consideration public input.	RE	During/ Post Construction
Chapel-1: Coordinate with Calvary Chapel. To avoid construction-related noise impacts on the Calvary Chapel during church services on Sundays, there would be no construction in close vicinity of the church that could cause noise disturbance to services. The Resident Engineer will coordinate with the church on their service schedule.	RE	During Construction
Species-1: Biological Monitor during In-stream Work. A qualified biologist would monitor in-stream construction activities to ensure adherence to all environmental permit conditions.	RE, Qualified Biologist	During Construction

Task and Brief Description	Responsible Branch / Staff	Timing / Phase
Measures to Avoid or Minimize Non-significant Impacts		
Species-2: Roosting Bat Protection. The following would be implemented to protect night roosting bats: • Work activities would be limited to one portion of the bridge structure at a time between the hours of 10:00 PM and sunrise. No impact pile driving or hoe-ramming would occur during these hours; • Airspace access to the structures would not be eliminated—as long as suitable roost (resting) habitat remains on site; • Lighting used for night work would be focused specifically on the portion of the bridge actively under construction, and/or traffic control and staging, as needed; • Personnel would not be present under the bridge during the evening and night in non-active work areas.The following would be implemented to protect maternal or day roosting bats, if encountered:• A preconstruction bat survey for maternity roosts (April 1 to August 31) or day roosts (year-round) shall be conducted by a qualified biologist and done within 14 days prior to activities that remove vegetation or structures. • In the unlikely event that evidence of a day roost or maternity roost is discovered anywhere within the project footprint, Caltrans shall develop a plan in consultation with CDFW to safely exclude bats in accordance with Fish and Game Code and the SAA. • Bats shall not be evicted during the coldest winter months (December through February) if there is evidence that they could be in torpor or hibernating in a day roost within the bridge during that period; and bats shall not be evicted during the maternity season (March 1 to August 31) unless the colony can be safely evaluated by a qualified biologist and the biologist determines that it is no longer active. • Appropriate measures to safely exclude bats from day roosts may include sealing cavities (if bats are no longer using them) or using one-way doors (if colony locations are still in use) during periods when bats can readily and safely move to other locations without harming adults or young. To avoid harm to bats, exclusion devices would be set up 2 hours after sunset, between September 15 and October 31 and/or between March 15 and April 15.	RE, Qualified Biologist	During Construction
Species-3: Marine Mammal Monitoring. A biological monitor will be present to monitor for marine mammals during all construction activities that have the potential to produce impulsive hammering sounds within the Smith River, including any pile installation, hoe-ramming, or jackhammering. A Marine Mammal Monitoring Plan will be prepared prior to construction that includes adaptive measures, such as defining a safety zone around in-river activities. To minimize exposure to marine mammals and possible harm from construction activities, no impact pile driving would be initiated when marine mammals are detected within these safety zones. In addition, during impact driving, when a marine mammal is detected through on-site monitoring within the respective safety zones, or is about to enter the safety zones, impact pile driving would be halted and not resumed until the animal was seen to leave the safety zone on its own, or 30 minutes elapsed since the animal was last seen.	RE, Qualified Biologist	During Construction
Species-4: Pre-construction Survey for Amphibians and Reptiles. A pre-construction survey for amphibians and reptiles would be completed by a qualified biologist prior to any ground disturbing activities. Any reptiles, frogs, tadpoles, and egg masses found during the initial survey would be relocated to suitable habitat outside of the project area by the biologist prior to conducting in-stream work in suitable habitat or electrofishing for salmonids or lamprey. The biologist would be present during all phases of in-stream construction to assist with relocation efforts as they arise. The specific requirements for surveys and relocation would be identified in the project's Aquatic Species Relocation Plan.	RE, Qualified Biologist	Pre-Construction
Species-5: Aquatic Species Relocation. Prior to any dewatering, diversions, or stream crossings, the contractor would be required to provide to Caltrans for approval an Aquatic Species Relocation Plan as part of the Construction Site Dewatering and Diversion Plan. Electrofishing for salmonids must comply with the Guidelines for Electrofishing Waters Containing Salmonids listed under the Endangered Species Act published by NMFS. The plan would include provisions for amphibians, reptiles, and lamprey, as well as salmonids.	RE, Qualified Biologist	During Construction
Species-6. Seasonal In-stream Restrictions. To protect the most vulnerable life stages of sensitive fish species that occur within the Smith River, in-stream work would be restricted to the period between June 15th and October 15th. Construction activities restricted to this period include any work within the bed, bank, or channel of the Smith River.	RE	During Construction

Task and Brief Description	Responsible Branch / Staff	Timing / Phase
Measures to Avoid or Minimize Non-significant Impacts		
Species-7: Hydroacoustic Monitoring. Hydroacoustic monitoring would be conducted during all construction activities that have the potential to produce impulsive sound waves, including, but not limited to, pile driving, hoe-ramming, or jackhammering. Hydroacoustic monitoring would ensure compliance with the terms and conditions resulting from Section 7 Endangered Species Act Consultation with NMFS and Consistency Determination with CDFW. Where impact pile driving is required, hydroacoustic monitoring would be performed to determine compliance with established objectives (e.g., distances to cumulative noise thresholds) and identify corrective actions to be taken should the thresholds be exceeded. A Hydroacoustic Monitoring Plan would be prepared prior to construction that addresses the frequency of monitoring, positions that hydrophones would be deployed, and techniques for gathering and analyzing acoustic data, quality control measures, and reporting activities.	RE, Qualified Biologist	During Construction
Species-8: Pile-driving Methods. The following measures would be implemented to minimize potential impacts from pile driving. • Installation of the permanent piles, which will occur within cofferdams, is proposed to occur using an oscillation technique, avoiding or minimizing the risk of injury of fish from pile driving. • Vibratory pile driving will be used in lieu of impact pile driving whenever feasible. Impact driving and hoe-ram operations will be minimized to the extent practicable. • All in-channel pile driving activities will be conducted between June 15th and October 15th to avoid the primary salmon migration seasons. • Impact driving and hoe ram operations will be limited to daylight hours only. • Attenuation methods (e.g., bubble curtains) will be applied where feasible.	RE	During Construction
Species-9: Lamprey Protection. Because lamprey ammocoetes may not emerge from dewatered substrates until they begin to desiccate, which often occurs at night after other fish salvage operations have ceased (USFWS 2010), dewatering and relocation efforts for lamprey would be performed in accordance with Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (*Entosphenus tridentatus*) (USFWS 2010), which include the following measures:• A pre-construction survey conducted by a professional fisheries biologist prior to construction to identify lamprey presence.• If detected, electrofishing would be performed to capture and relocate ammocoetes within the work zone to a safe area away from the construction site.• Any lamprey captured within cofferdams during dewatering and fish relocation efforts would be relocated to a safe area away from the construction site.• The orientation, siting and type of fish screens used for dewatering operations should be selected to minimize potential entrainment of lamprey.• A professional fisheries biologist would be present during channel excavations to sift through removed substrate to salvage any remaining ammocoetes, returning them to the river a safe distance away from the construction site.	RE, Qualified Biologist	During Construction

Task and Brief Description	Responsible Branch / Staff	Timing / Phase
Mitigation for Significant Impacts under CEQA.		
Visual-5: Screen Nearby Residences and Traveling Public. For the build alternatives, plant trees and shrubs to screen residences from the highway and retaining walls, as well as the traveling public from the quarry.	Landscape Architect	During/ Post Construction
Visual-6: Screen Chapel. For Alternative 1 and 2, screen the Chapel from views of the highway and retaining walls by planting native trees and shrubs.	Landscape Architect	During/ Post Construction
Coho-1: Coho Salmon. To fully mitigate for take of coho salmon that may result from this project, Caltrans would improve fish passage at a site deemed acceptable to CDFW (see EIR/EA for full text of measure). A possible candidate for mitigation is the remediation of the culvert that carries Dominie Creek under Highway 101 at Post Mile 39.8. Prior to any project activities that could incidentally take SONCC coho salmon, Caltrans will provide CDFW with written documentation that Caltrans has allocated sufficient funds, acceptable to and approved by CDFW, in the Expenditure Authorization for the project to ensure implementation of all measures to minimize and fully mitigate the incidental take of SONCC coho salmon.	Project Biologist	During Construction

Task and Brief Description	Responsible Branch / Staff	Timing / Phase
Mitigation for Significant Impacts under CEQA.		
Mussel-1: Western Pearlshell Mussel. The following measures would be implemented to minimize impacts on western pearlshell mussels (see EIR/EA for full text of measure). -Conduct a mussel salvage and relocation effort from the Dr. Fine Bridge Site - Establish a mussel bed ESA. -Normalize summer flow to the extent practicable, including softening gravel berm corners and making gravel berms permeable. - Implement standard BMPs to avoid hazardous material spills or leaks, reduce the potential for sedimentation, and avoid other impacts on water quality. -Minimize erosion impacts. -Monitor and remove racked debris. -Discourage recreational boat access at the mussel bed.	Qualified Biologist, RE	Pre/ During/ Post Const
Riparian-1: Riparian Habitat. Compensatory mitigation would be required to offset permanent and temporary impacts on riparian habitat. Caltrans proposes restoration and replanting of temporarily disturbed areas to enhance riparian habitat. Native vegetation will be planted. Options for on-site riparian restoration areas include restoring the unvegetated disturbed area along the Smith River's south bank. Off-site options include off-channel enhancements on tributaries of the Smith River such as Stotenburg Creek channel work and coordinating with watershed steward organizations such as the Smith River Alliance. Mitigation ratios for riparian impacts in the past for projects within the coastal zone have been 4:1, but final ratios would be determined in coordination the resources agencies.	Revegetation and mitigation specialist, Project Biologist	Pre/ During/ Post Const
Wetlands-1: Wetlands. While the standard measures built into the project would help offset potential effects, Caltrans anticipates pursuing compensatory mitigation for impacts on wetlands and other waters. Both on-site enhancement and off-site restoration are being considered. Mitigation options include, but are not limited to, the following. - On-site enhancement of Compacted Herbaceous Wetland south of Smith River. -On-site revegetation and enhancement (e.g., invasive species removal) within Palustrine Scrub-Shrub, Broadleaf Riparian Forest, and Palustrine Deciduous habitats both north and south of the Smith River in the project vicinity.- Off-site stream restoration and fish passage improvement at Dominie Creek, a tributary to Rowdy Creek that flows into the Smith River approximately four miles north of the project.- Off-site wetland preservation and enhancement at the Hambro property, located northwest of and directly adjacent to Caltrans' Crescent City Marsh Wildlife Area. At least 9 acres of temporary wetland mitigation credit has been secured for the project at this location. - Off-site riparian, wetland, and stream improvements within the Smith River watershed, such as Stotenburg Creek channel work, undertaken in cooperation with watershed stewardship organizations. Mitigation may include a combination of on- and off-site restoration efforts. If off-site restoration were implemented, the appropriate measures would be identified and coordinated through USACE, North Coast RWQCB, and CCC. Wetland mitigation ratios in the coastal zone are typically 4:1; exact ratios would be determined in coordination with the permitting agencies.	Revegetation and mitigation specialist, Project Biologist	Pre/ During/ Post Const

Appendix I Title VI Policy Statement 2018

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Making Conservation a California Way of Life.

April 2018

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Laurie B

LAURIE BERMAN
Director